Widemere Recycling Facility

Operational Environmental Management Plan

Prepared for Boral Recycling Pty Ltd | 27 May 2021

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Final

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	January 2010	Mick Bullock	
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Executive Summary

ES1 Overview

This Operational Environmental Management Plan (OEMP) for the Widemere recycling facility (the facility) has been developed to meet the requirements of Condition D2 (Schedule D) of development consent SSD 6525. The objective of the OEMP is to establish a framework for environmental management in accordance with the consent, as well as to meet the requirements of Boral's Health, Safety, Environment and Quality (HSEQ) management system. This OEMP covers the entire Development and applies to a processing capacity at the facility of up to 1,000,000 tonnes per annum (tpa). As of May 2021, the expanded operations, as defined SSD 6525 have not been triggered.

This OEMP provides details of performance monitoring and management at the facility for environmental aspects including noise and vibration, air quality, groundwater, surface water, erosion and sediment control and waste management. The OEMP also provides details on the facility's environmental management framework, roles and responsibilities, incident response, emergency response and training and review.

The monitoring points and requirements for the main environmental aspects are summarised below.

ES2 Noise and vibration

Noise and vibration monitoring will be conducted in accordance with the requirements of the consent and the facility's environment protection licence (EPL) 11815. Monitoring will occur within one year of the date of the consent and after a substantial change to onsite operations, as well as in response to complaints regarding noise. Noise monitoring will include:

- operator-attended noise monitoring for a minimum of 15 minutes duration at three monitoring locations, during each period (day, evening, night and morning shoulder); and
- attended noise monitoring scheduled with consideration given to the occurrence of regular operations and forecast appropriate meteorological conditions.

ES3 Air quality

Air quality monitoring will be conducted in accordance with the requirements of the consent and the EPL.

Dust deposition rates are recorded at a gauge in the southwest corner of the facility. Monthly results are collated into a spreadsheet for ongoing calculation of annual average for comparison to assessment criteria of 4 g/m^2/month. Due to the physical nature of construction and demolition materials, it is generally accepted that the ash level (sample heated to 850 degrees Celsius for 30 minutes, as per the standard), may be used as a measure to reduce the impact arising from detecting other sources of organic deposited matter. These organic sources usually include insects, bird droppings, pollen, grass seed etc. Ash in the standard is defined as 'the mass of that portion of the insoluble matter remaining after combustion.

ES4 Groundwater

A groundwater monitoring program has been prepared in accordance with the requirements of the consent, which requires a groundwater monitoring program to be prepared within six months of the commencement of expanded operations. The groundwater monitoring network at the facility consists of a total of four monitoring bores, two deep monitoring bores targeting the uppermost water bearing zones within the site's surficial geology and two shallow monitoring bores to assess potential seepage from the sediment basins.

Prior to expanded operations at the facility the frequency of water quality sampling at the four monitoring bores was monthly from January to May 2017.

In the first six months following commencement of expanded operations, groundwater quality sampling is to be conducted monthly at all monitoring bores and Sediment Basin 2. The water quality sampling frequencies after the first six months of expanded operations are to be confirmed following a review of monitoring data. Note that as of May 2021, expanded operations as defined in SSD 6525 has not been triggered.

ES5 Surface water, erosion and sediment control

A surface water mitigation and monitoring plan has been prepared in accordance with the consent. Surface water monitoring at the facility will include the following:

- rainfall monitoring at the on-site weather station;
- process water monitoring including water cart use and all other process water uses;
- water level monitoring in Dams 1 and 2; and
- water quality monitoring of the Dam 1 inflows and near the Dam 2 outlet.

The surface water monitoring plan including monitoring framework, analytes and reporting requirements are provided in the SWMMP provided in Appendix E.

The SWMMP is currently being revised in consultation with NSW EPA. Once the plan has been finalised, this OEMP document will be updated to reflect any operational changes associated with surface water management on the site.

ES6 Waste management

A waste monitoring program has been prepared in accordance with the consent.

The quantity and type of inbound and outbound products are recorded at the weighbridge and tracked through the Quarry Reporting System (QRS).

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1 Introduction

1.1 Purpose and objectives

The Widemere recycling facility (the facility) has approval to accept construction and demolition waste, where it separates, crushes and blends it with quarry material to form construction materials. Products produced by the site include recycled DGB, recycled aggregates (10 mm and 20 mm), recycled road base, unbound and bound base, pipe bedding, sub-base (40 mm) and reclaimed asphalt pavement.

On 25 November 2016, DPIE granted development consent SSD 6525 under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) for an increase in the processing capacity of the facility from 750,000 tonnes per annum (tpa) to 1,000,000 tpa. Other changes were also approved including expanding the site stockpile area by 0.4 ha, increasing the waste streams processed at the site, modifying the hours of operation and a realignment of an internal haul road.

This Operational Environmental Management Plan (OEMP) has been developed to meet the requirements of Condition D2 (Schedule D) of development consent SSD 6525. The objective of the OEMP is to establish a framework for environmental management in accordance with development consent SSD 6525, as well as to meet the requirements of Boral's Health, Safety, Environment and Quality (HSEQ) management system. The OEMP covers the entire Development and applies to a processing capacity at the facility of up to 1,000,000 tonnes per annum (tpa).

As of May, 2021, the expanded operations as defined in SSD 6525 has not been triggered.

1.2 Description of facility

The facility is located off Widemere Road, Wetherill Park, approximately 28 km west of the Sydney CBD in the Fairfield local government area (LGA). The facility, located on Lot 3 Deposited Plan 218194, covers approximately 9.8 ha.

Access to the facility is via Widemere Road. Immediately north of the facility Widemere Road becomes Reconciliation Road which provides linkages between significant industrial and commercial precincts in the Fairfield, Blacktown and Holroyd LGAs. It is also the main transport route through the Greystanes Estate Southern Employment Lands immediately north of the facility.

The topography on the site varies between 32 m and 50 m Australian Height Datum (AHD) within the site boundary, increasing from south to north.

Boral Recycling operates the facility to process demolition and surplus construction materials, particularly concrete and brick for reuse. The materials processed at the facility are blended with quarry product to produce recycled road bases and aggregate. The materials recycled at the site are generated by civil contractors, demolishers, builders and construction companies and comprise discarded materials from road pavement excavation, kerb and guttering, excavation and demolition works.

1.3 Operating hours

The operating hours of the recycling facility are shown in Table 1.1.

Table 1.1 Hours of operation

Activity	Day	Hours
Processing, receival and dispatch	Monday to Saturday	6 am to midnight
	Sunday	6 am to 6 pm (one Sunday per calendar month)
	Public holidays	Nil
Ancillary operations	Monday to Saturday	6 am to midnight
	Sunday	6 am to 6 pm
	Public holidays	Nil

Notes: *Ancillary operations means any servicing and/or maintenance of the equipment/machinery associated with the development, loading and unloading of material onto/from vehicles and stockpiles and the selling of recycled product.*

1.4 Surrounding environment

The facility is located in a predominantly industrial area. To the south, the facility is bordered by Prospect Creek and its riparian zone, and beyond is the Liverpool-Parramatta T-way and Wetherill Park industrial precinct; to the north is the Greystanes Estate Southern Employment Lands industrial precinct; to the west and north-west is Prospect Reservoir and surrounding buffer land; immediately east of Reconciliation Road is a large stormwater detention basin, and residential and industrial land uses approximately 1 km further east. The former Sydney Water Supply Canal adjoins the land on the facility's northern boundary.

The closest residential areas are approximately 1 km to the east in Greystanes, and 1.5 km north-east of the facility in Pemulwuy. Recreational land uses include parklands within the buffer land surrounding Prospect Reservoir which includes shared pedestrian/cycle paths and Walder Park to the north of the facility. Prospect Creek, a natural waterway that forms a sub-catchment of the Georges River catchment, is immediately to the south of the facility. There are several drains which contribute to Prospect Creek from surrounding area, including a catchment drain located within the facility that flows to Prospect Creek.

1.5 Availability of OEMP

The manager of the facility is responsible for distribution of the OEMP to relevant personnel. Copies of the OEMP are issued to the personnel listed in Table 1.2 below.

Table 1.2 Distribution of the OEMP

Position	Issue date
State manager	
Operations manager	
Site manager	
Site supervisors	
Regional environmental manager	
HSE advisor	
Senior planning and development manager	

A copy of the OEMP is available in the site office.

1.6 OEMP structure

The OEMP is structured as follows:

- Executive Summary.
- Introduction (Chapter 1).
- Regulatory requirements (Chapter 2).
- Strategic framework for environmental management (Chapter 3).
- Roles and responsibilities (Chapter 4).
- Environmental performance (Chapter 5), including:
  - noise and vibration (Section 5.1);
  - air quality (Section 5.2);
  - groundwater (Section 5.3);
  - surface water, erosion and sediment control (Section 5.4);
  - waste (Section 5.5); and
  - other environmental measures.
- Communication (Chapter 6).
- Incident and non-conformance response (Chapter 7).
- Emergency response (Chapter 8).
- Training and review (Chapter 9).

1.7 Other relevant policies, documents and guidelines

Other Boral HSEQ policies, documents and guidelines which are referenced in the OEMP include:

- Widemere Recycling Emergency Response Plan 2020;
- Widemere Recycling Pollution Incident Response Management Plan 2020;
- GRP-HSEQ-1-01 Management System Framework and Operational Control;
- GRP-HSEQ-1-02 HSEQ Policy;
- POL-HSEQ-02 Environment Policy;
- GRP-HSEQ-1-03, Hazard Identification and Risk Management Standard;
- GRP-HSEQ-1-04 Legal and Other Requirements;

- GRP-HSEQ-1-05 Objective Targets and Improvement Plans;
- GRP-HSEQ-2-01 Organisational Roles, and Responsibilities and Resources;
- GRP-HSEQ-2-02 Communication and Consultation;
- GRP-HSEQ-2-02-F02 HSE Alert Template;
- GRP-HSEQ-2-02-F03 Quality Alert Template;
- GRP-HSEQ-2-03 Training Competency and Awareness;
- GRP-HSEQ-2-09 Emergency Preparedness and Response Standard;
- GRP-HSEQ-2-10 Crisis Management Standard;
- GRP-HSEQ-3-01 Monitoring and Review Standard;
- GP-HSEQ-3-02 Incident Reporting Investigation and Action Management;
- GRP-HSEQ-3-03 Performance Assessments and Audits Procedure;
- GRP-HSEQ-4-05 First Aid Standard;
- GRP-HSEQ-8-01 Environmental Aspects and Impacts Procedure;
- GRP-HSEQ-8-02 Water Management Element;
- GRP-HSEQ-8-03 Land Management Procedure;
- GRP-HSEQ-8-04 Waste Management Element;
- GRP-HSEQ-8-05 Noise Management Element; and
- GRP-HSEQ-8-06 Air Management Element.

2 Regulatory requirements

2.1 Development consent

The requirements for the OEMP are stated under Condition D2 of Schedule D of development consent SSD 6525. Information required for inclusion in the OEMP is listed in Table 2.1.

Table 2.1 OEMP requirements under Condition D2, Schedule D of development consent SSD 6525

Condition	Detail required	Location in OEMP
D2 – The Applicant shall implement an Operational Environmental Management Plan for the Development. This plan must:		
(a)	be prepared by a suitably qualified and experienced expert;	Cover/document control
(b)	be submitted to and approved by the Secretary prior to the commencement of the expanded operations;	
(c)	provide a strategic framework for environmental management of the Development;	Chapter 3
(d)	identify the statutory approvals that apply to the Development;	Chapter 2
(e)	describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development;	Chapter 4 and Section 8.2
(f)	detail the commissioning period, including surface water monitoring and the deployment of mitigation measures;	Chapter 5
(g)	describe in general how the environmental performance of the Development would be monitored and managed;	Chapter 5
(h)	include the relevant plans listed in Schedule C;	See Schedule C plans below
(i)	include a process for ongoing review and update of the OEMP (including documenting any changes to the development, surface water management system and mitigation measures identified in the surface water mitigation and monitoring plan and any audits);	Chapter 9
(j)	describe the procedures that would be implemented to: i. keep the local community and relevant agencies informed about the operation and environmental performance of the Development; ii. receive, handle, respond to, and record complaints; iii. resolve any disputes that may arise; iv. respond to any non-compliance; and v. respond to emergencies.	Chapter 6, Chapter 7 and Chapter 8
Schedule C – management and monitoring plans		
C1	The Applicant shall prepare a Waste Monitoring Program for the Development.	Appendix A
C10	As part of the OEMP for the Development, required under Condition D2 of this consent, the Applicant shall prepare a Noise Management Plan.	Appendix B
C17	As part of the OEMP for the Development, required under Condition D2 of this consent, the Applicant shall prepare a Dust Management Plan.	Appendix C
C38	Within six months of the commencement of the expanded operations. The Applicant shall conduct a Groundwater Monitoring Program.	Appendix D
C41	Prior to any controlled discharges permitted under the EPL the Applicant must provide a Surface Water Mitigation and Monitoring Plan.	Appendix E

2.2 Environment protection licence

Under the NSW *Protection of the Environment Operations Act 1997* (POEO Act) the site is a scheduled premise and is licensed for resource recovery and waste storage. Environment protection licence (EPL) 11815 has been granted for the site. As this document is amended from time to time the most recent version can be found via the NSW EPA public register http://www.epa.nsw.gov.au/prpoeoapp/. A hard copy of the EPL is held on site and an electronic copy is available on the Boral website https://www.boral.com.au/our-commitment/environmental-reporting

The site's EPL provides environmental management, monitoring and reporting criteria, including specific controls for air quality, water, waste and noise.

2.3 Resource Recovery Order and Exemptions

All products sold by the facility are required to meet the appropriate Resource Recovery Orders and Exemptions under Part 9, Clause 93 of the NSW *Protection of the Environment Operations (Waste) Regulation 2014*. These Orders impose the requirements that must be met by suppliers of resource recovered materials.

3 Strategic framework for environmental management

3.1 Statutory requirements

The facility's environmental performance criteria are defined in the development consent SSD 6525 and EPL 11815. All environmental monitoring and management will be carried out in accordance with the requirements of the development consent and the EPL.

3.2 Boral HSEQ management system

Boral has adopted a standardised approach to documenting its Health and Safety, Environment and Quality Management System (HSEQ MS) to ensure best practice in its core operating activities is in place and measured.

Boral has a HSEQ MS to:

- assist company employees and contractors to identify and understand their responsibilities in meeting their HSEQ obligations;
- provide the primary requirements for implementation of a common HSEQ MS;
- establish the implementation guidelines that sit between relevant legislative, regulatory and Industry standard requirements, and the businesses functional and/or line of business operating procedures; and
- provide a single point of reference for company compliance to Australian standards, and to various accreditation bodies.

A full description of the Boral HSEQ MS can be found in GRP-HSEQ-1-01 Management System Framework and Operational Control. Several Boral sites operating under the Boral HSEQ MS are certified under the ISO14001 standards for Environmental Management Systems.

Boral is committed to the protection and minimisation of impact upon the environment and the communities in which it operates. In order to achieve this, Boral’s activities will be executed according to its Environmental Policy. The procedure; GRP-HSEQ-1-02 HSEQ Policy discusses in detail the development and review of HSEQ Policies.

Boral Group level objective requirements can be found in GRP-HSEQ-1-05 Objective Targets and Improvement Plans procedure. Environmental objectives are communicated to persons working under Boral control, and have the ability to influence the achievement of environmental compliance on site.

The environment elements within the HSEQ define the minimum standard required for environment management and provide operational controls required to manage environmental risk. The elements are discussed in the following HSEQ documents:

- GRP-HSEQ-8-02 Water Management;
- GRP-HSEQ-8-03 Land Management;
- GRP-HSEQ-8-04 Waste Management;

- GRP-HSEQ-8-05 Noise Management; and

- GRP-HSEQ-8-06 Air Management.

These HSEQ documents and how they relate to this OEMP are described below.

3.2.1 Water Management

GRP-HSEQ-8-02 Water Management provides the minimum mandatory requirements for water management so that activities that may impact on water resources are considered with measures put in place to comply with water usage and discharges on all internal and external requirements. The minimum mandatory requirements under this guideline are:

- All sites shall comply with applicable licences, permits, guidelines and standards for water quality.

- All sites shall identify clean and dirty water flows and shall segregate clean water flows from dirty water flows.

- Recycling and reusing wastewater shall be carried out wherever possible to reduce the consumption of potable water.

- All sites shall minimise any offsite discharge—any discharge shall be controlled and monitored.

Sections 5.3 and 5.4 of this OEMP and Appendices D and E have been prepared to meet Boral's water management requirements under this guideline.

3.2.2 Land Management

The HSEQ MS Land Management Procedure *GRP-HSEQ-8-03* has been developed to outline land management practices and to ensure that operations are carried out within relevant regulatory requirements relating to contamination, remediation and rehabilitation. The minimum mandatory requirements under this guideline are:

- All Boral businesses shall maintain a Contaminated Land Register that identifies any contamination, assesses the level of risk to human health and the environment, and the status of recommended remediation and/or control measures.

- All Boral businesses shall undertake land management practices and reviews in cases of significant change of land use or changes of ownership.

- Vegetation clearing shall be carried out in a manner that ensures minimal disturbance to the surrounding environment with obtained internal approval that ensures legislative requirements are identified and met.

- All operations shall ensure final end use requirements are identified and met.

This OEMP has been prepared to meet Boral's land management requirements under this guideline.

3.2.3 Waste Management

The HSEQ MS Waste Management Procedure *GRP-HSEQ-8-04* outlines standard waste management practices to monitor and measure waste materials Boral sites produce, reuse, recycle, reduce, and dispose of, and to ensure those actions comply with both licensing and regulatory requirements. The minimum mandatory requirements under this guideline are:

- A Waste Register shall be maintained at all sites.
- Sites shall actively facilitate resource efficiency through reuse or recycling of waste materials.
- Materials not suitable for reuse or recycling shall be directed to a waste or resource recovery facility, which is lawfully permitted to accept such material.
- A Subject Matter Expert (SME) shall be consulted before any material that is not already defined in procedures is moved or disposed of.

Section 5.5 and Appendix A of this OEMP have been prepared to meet Boral's requirements for waste management under this guideline.

3.2.4 Noise Management

Environmental noise (including vibration) is kept to acceptable levels for neighbours and the community. *GRP-HSEQ-8-05 Noise Management* outlines the protocol and minimum standards for noise management. The minimum mandatory requirements under this guideline are:

- Regulatory requirements shall be met.
- Monitoring of boundary noise (and vibration) shall be conducted where required.
- Noise (and Vibration) Management Plans shall be prepared and implemented where operations are at risk of non-compliance with regulatory limits or disturbance of local stakeholders.
- Community complaints are to be investigated and mitigating measures adopted to ensure noise and vibration levels are acceptable to the local community and/or regulatory authorities.

Section 5.1 and Appendix B of this OEMP have been prepared to meet Boral's requirements for noise management under this guideline.

3.2.5 Air Management

Air quality resulting from the site's operations and/or maintenance is managed to minimise its impact on the amenity of the local environment, and to prevent adverse environmental and/or health impacts. Boral HSEQ procedure *GRP-HSEQ-8-06 Air Management* element provides air management practices for all Boral sites**.** The minimum mandatory requirements under this guideline are:

- Air quality shall be managed at all sites, documenting operations and maintenance of pollution control equipment.
- All emissions to air (point source and fugitive) shall meet regulatory requirements and where required, applicable air quality data shall be reported to relevant regulatory agencies.
- All complaints, incidents and breaches shall be reported, documented, investigated and appropriately actioned.

Section 5.2 and Appendix C of this OEMP have been prepared to meet Boral's requirements for air management under this guideline.

3.3 Hazards and risk

3.3.1 Hazard identification and risk management

The Boral HSEQ MS procedure GRP-HSEQ-1-03, Hazard Identification and Risk Management outlines the risk management protocol and framework for management of risk within Boral. The risk assessment process for the environment for a site is captured within the site specific 'Aspects and Impacts Register'.

3.3.2 Environmental aspects and impacts

Risk management applies to every decision that could affect the environmental objectives and outcomes of the site, from the construction method selected to the treatment of issues.

An aspects and impacts register has been developed for the site in accordance with Boral's GRP-HSEQ-8-01 Environmental Aspects and Impacts Procedure and using risk management procedures outlined within HSEQ-1-03 Hazard and Risk Identification and Risk Management. The purpose of the aspects and impacts register is to identify and assess the operations and activities that can interact with the environment, and ensure these impacts are identified, reviewed and appropriately managed. The minimum mandatory requirements under Boral's GRP-HSEQ-8-01 Environmental Aspects and Impacts procedure are:

- An initial aspect identification shall be carried out by a Site Manager and/or Supervisor together with a person of competent environmental experience.
- Risks shall be adequately assessed against the established Company Risk Matrix.
- Aspects identified during the assessment shall be documented in an Environmental Aspects and Impacts Register.
- 'Medium' or 'High' risks shall be considered in setting Business Unit environmental action plans.
- The Environmental Aspect and Impacts Register shall be reviewed at a frequency as required (minimum of three years or after changes to processes).

The aspects and impacts register has been used to identify and prioritise environmental management measures outlined throughout this OEMP.

4 Roles and responsibilities

4.1 Environmental roles and responsibility

The facility has established roles and responsibilities for personnel to implement the requirements of this OEMP. Personnel are supported by an organisational structure that provides appropriate levels of support and authority for the effective execution of roles, including environmental management. The organisational structure relevant to the site is located on the Boral Intranet and can be found at OrgPlus. The HSEQ element GRP-HSEQ-2-01 Organisational Roles, and Responsibilities and Resources provides the framework for identifying and developing the HSEQ roles and responsibilities. Key roles and responsibilities for the site are summarised in Table 4.1.

Table 4.1 Environmental roles and responsibilities

Role	Responsibility	Authority
State manager	• approve the OEMP and any revisions which are incorporated; and • delegate environmental management responsibilities to personnel.	• to suspend site work if health and safety of personnel and/or environment is endangered; and • to suspend an individual from activities for disregarding the OEMP following consultation with the Site Manager
Operations Manager / Site manager	• implement the OEMP at the site including having relevant resources, and developing site specific components (such as the aspects and impacts register); • undertake the required environmental reporting including EPP, Regulatory Reporting, Compliance Declaration, filling incidents forms and maintaining records; • lead continuous environmental improvement including providing training, managing incidents and issues as required; • issue clearances for work where required; • co-ordinate with personnel on matters in relation to site operations; • document and act upon complaints; and • ensure all personnel possess the required skills and are appropriately trained for the type of work that they are undertaking.	• to direct personnel to change work practices if they are deemed to be hazardous to the environment and/or health and safety of personnel; • to temporarily suspend site work if health and safety of personnel and/or environment is endangered, pending further consideration with the State Manager; and • to temporarily suspend an individual from activities for disregarding the OEMP.
Regional environmental manager	• support the site manager and site staff with development and implementation of the OEMP; • assist the site manager with environmental training, managing environmental incidents and issues; • undertake audits as required;	

Table 4.1 Environmental roles and responsibilities

Role	Responsibility	Authority
	• review the site environmental documentation as required; and • assist with developing site EPP and Environment Limits Poster.	
Site supervisor	• liaise with the site manager in relation to the requirements of the OEMP; • ensure that work activities are undertaken in a manner consistent with the OEMP; and • implement environmental management measures outlined in the OEMP.	• to report activities in which the environment and/or health and safety of site personnel is at risk.
Weighbridge operator	• liaise with the site manager in relation to the requirements of the OEMP; and • ensure that materials are managed in a manner consistent with the OEMP.	• to report on materials management activities, and notify management of instances in which the activities cause or have potential to cause risk to the environment.
All site personnel	• reporting all incidents, near misses and hazards; • comply with all environmental policies, procedures and instructions; and • participate in environmental training, meetings and toolboxes.	

Boral Recycling site safety and environmental personnel responsible for implementing this OEMP are listed below.

- State manager
- Operations manager
- Site manager
- Site supervisor
- Environment Manager NSW/ACT
- HSE advisor
- Weighbridge operator

5 Environmental performance

The management procedures described in this section are site specific and are employed to ensure that environmental impacts are controlled to acceptable levels according to the development consent Schedule C.

5.1 Noise and vibration

A noise management plan (NMP) has been prepared for the site in accordance with Condition C10 and C11, Schedule C of the development consent. The NMP is provided in Appendix B and is summarised in this section.

5.1.1 Overview

The closest residential receptors are located approximately 1 km to the east of the facility in Greystanes and 1.5 km north-east of the facility in Pemulwuy, with no direct line of sight to the facility. A comprehensive Noise Assessment (Appendix D of the EIS) was prepared as part of the development application and concluded that noise emissions from worst case scenario site activities were well below the project specific noise levels (PSNLs) at all assessment locations. In addition, the Noise Assessment also concluded that:

- potential sleep disturbance impacts satisfied the relevant criteria at all assessment locations;
- the facility's cumulative impacts at the closest residential receptors were negligible (up to 1 dB during the daytime and no increase for night time periods);
- road traffic noise associated with the recycling facility's operations was calculated to comply with the relevant NSW Road Noise Policy criteria; and
- there is no history of noise complaints received at the facility or by the EPA.

5.1.2 Performance criteria

The site's noise limits, as specified in development consent SSD 6525 and EPL 11815, are provided in Table 5.1.

Table 5.1 Operational noise limits (dB)

Location	**Day (7am – 6pm)**	**Evening (6pm – 10pm)**	**Night (10pm – 12am)**		**Morning shoulder (6am – 7am)**
	$L_{Aeq,15\ minute}$	$L_{Aeq,15\ minute}$	$L_{Aeq,15\ minute}$	$L_{Aeq,15\ minute}$	$L_{Aeq,15\ minute}$
71 Munro St, Greystanes	39	38	35	50	39
146 Daruga Ave, Nelsons Ridge	35	35	35	50	35
Greystanes Estate – Future southern extent[1]	39	37	35	50	39

Notes:
1. *Identified as Location R10 in Widemere Recycling Facility – Noise Impact Assessment (NIA) prepared by EMGA Mitchell McLennan (Ref J13127RP1 dated 27 April 2015).*
2. *Noise generated by the Development is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the Industrial Noise Policy.*

5.1.3 Management and mitigation measures

Condition C9 of development consent SSD 6525 requires the following in relation to noise mitigation at the site:

- implementation of best management practice, including all reasonable and feasible noise management and mitigation measures to prevent and minimise operational, low frequency and traffic noise generated by the development;
- minimise the noise impacts of the development during adverse meteorological conditions;
- maintain the effectiveness of any noise suppression equipment on plant at all times and ensure defective plant is not used operationally until fully repaired; and
- regularly assess any noise monitoring data and relocate, modify and/or stop operations to ensure compliance with the relevant conditions of development consent SSD 6525.

It is not considered necessary to include specific triggers for noise mitigation measures, given the history of compliance and no complaints, the large buffer between the site and the closest residential receptors, and the favourable modelling results from the noise assessment.

Specific noise management measures adopted at the site include the following:

- implementation of a noise management program to increase employee awareness of noise issues;
- regular servicing and maintenance of fixed and mobile plant to ensure the equipment is operating to specification;
- where reasonably practicable, mobile equipment and other maintenance activities are undertaken within the workshop;
- regular inspection of mufflers to ensure in-cab noise levels are below workplace Health and Safety Guidelines;
- use of “smart” alarms on mobile equipment (which limit the acoustic range of the warning) to warn of vehicles reversing;
- Managing plant stockpile heights to reduce noise impacts during processing operations (a One Point Lesson for stockpile heights is provided in Appendix L);
- Monitoring of wind direction for noise impact to local residents to the East of the site; and
- Maintenance of roads and speed control (e.g. speed humps) to reduce traffic noise.

Other general noise mitigation measures that may be considered at the site, if required, include:

- restricting operation and movement of equipment on exposed areas during noise sensitive periods (e.g. temperature inversions);
- scheduling the loading of materials which are potentially noisier to occur at the least sensitive time of the day or night;

- siting noisy equipment behind structures that act as barriers, or at the greatest distance from the noise-sensitive area;
- orienting equipment so that noise emissions are directed away from any sensitive areas;
- efficient muffler design on relevant equipment; and
- barriers (in the form of free-standing walls, earth-mounds or bunds or placing acoustically significant equipment in trenches or cuttings).

5.1.4 Monitoring environmental performance

Monitoring of environmental performance shall include:

- operator-attended noise monitoring for a minimum of 15 minutes duration at each monitoring location shown in Figure 5.1, during each period (day, evening, night and morning shoulder); and
- attended noise monitoring scheduled with consideration given to the occurrence of regular operations and forecast appropriate meteorological conditions. The method for attended noise monitoring is detailed in the NMP (see Appendix B).

Noise monitoring locations consistent with the requirements of EPL 11815 are shown in Figure 5.1.

Noise monitoring shall occur within one year of the date of the consent and after a substantial change to onsite operations such as upon the commencement of expanded operations, as well as in response to complaints regarding noise.

Condition L5.7 of EPL 11815 states that "*for the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.*"

Source: EMM (2017); LPMA (2014)

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KEY

▭ Site boundary

● Noise monitoring location (EPA ID)

☐ Cadastre

— Local road

— Watercourse

🟩 NPWS reserve

Noise monitoring locations

Boral Widemere

Operational environmental management plan

Figure 5.1

5.2 Air quality

A dust management plan (DMP) has been prepared for the site in accordance with Condition C17, Schedule C of the development consent. The DMP is provided in Appendix C and is summarised in this section.

5.2.1 Performance criteria

Air quality criteria adopted for the site's most recent environmental assessment (EMM 2014) are summarised in Table 5.2. Air quality criteria apply to the total pollutant concentrations in the air (i.e. cumulative concentrations), not just the pollutants produced by the facility.

Table 5.2 Adopted impact assessment criteria

Pollutant	Averaging period	Criterion
TSP	Annual	90 µg/m³
PM_{10}	24 hours	50 µg/m³
	Annual	30 µg/m³
$PM_{2.5}$	24 hours	25 µg/m³
	Annual	8 µg/m³
Dust deposition	Annual	2 g/m²/month – increment 4 g/m²/month – cumulative

5.2.2 Management and mitigation measures

Mitigation measures are summarised in Table 5.3 below. The performance of all on-site mitigation measure technology will be routinely checked and serviced to maintain ongoing performance.

Table 5.3 Emission source mitigation measures

Emission source category	Mitigation measures in place at the facility
Wheel generated dust – unpaved roads	• wet suppression of haul roads is undertaken by watercart(s) on a regular basis; • travel speeds along all unpaved roads within the facility are limited to 15 km/hr; and • primary unsealed roads will be routinely maintained to minimise surface silt content and dust generation potential.
Wheel generated dust – paved roads	• all paved surfaces are routinely swept. The facility has a road sweeper that attends site regularly and as requested; • wet suppression of haul roads is undertaken by watercart(s) on a regular basis; • travel speeds along all paved roads within the facility are limited to 25 km/hr; and • all trucks leaving site must pass through one of two wheel wash facilities prior to exiting.

Table 5.3 Emission source mitigation measures

Emission source category	Mitigation measures in place at the facility
Material handling (truck unloading, handling by mobile plant, loading to trucks)	• the use of water sprays in the crushing and screening plant, the blending plant and at material stockpiles aids to increase the moisture content of product material and reduce the dust generation potential of material loaded to stockpiles and dispatched to market; • minimise the fall distance of material from plant (excavator, front end loader, etc) to load point (truck, stockpile, etc); and • ceasing of material handling activities under dry, windy conditions with excessive visual dust generation.
Material processing (crushing, screening, conveying)	• water sprays are fitted across the crushing and screening plant and the blending plant; • water cannons are used on crushing and screening areas to manage dust generation by wind from raw feed stockpiles; and • conveyor belts and transfer points will be routinely cleaned of overspill.
Wind erosion of stockpiles and exposed surfaces	• water sprays are installed in the material stockpiling area; • water cannons are used on crushing and screening areas to manage dust generation by wind from raw feed stockpiles; and • stockpile heights are limited to 20 m (a One Point Lesson for stockpile heights is provided in Appendix L).

5.2.3 Monitoring environmental performance

Condition M2 of the EPL for the facility identifies the air quality monitoring requirements for the facility, which are the continuous monitoring of particulates (deposited matter), in accordance with method AM-19 (NSW EPA, 2007).

Method AM-19 relates to the sampling of dust deposition rates on a monthly basis, in accordance with AS/NZS 3580.10.1:2003 - Methods for sampling and analysis of ambient air - Determination of particulate matter - Deposited matter - Gravimetric method.

This method prescribes that samples are collected every 30 ± 2 days and sent to an appropriate laboratory for analysis of the following parameters:

- insoluble solids – relates to the total filterable material within each sample;
- ash content – relates to the reside remaining following sample combustion by the laboratory (e.g. non-combustible crustal material);
- combustible material – sample content that is lost during sample combustion (biological material, coal, etc).

For assessment against regulatory compliance, ash content is compared to the criteria of 4 g/m^2/month as an annual average. Due to the physical nature of construction and demolition materials, it is generally accepted that the ash level (sample heated to 850 degrees Celsius for 30 minutes, as per the standard), may be used as a measure to reduce the impact arising from detecting other sources of organic deposited matter. These organic sources usually include insects, bird droppings, pollen, grass seed etc. Ash in the standard is defined as 'the mass of that portion of the insoluble matter remaining after combustion.

A complete 12 months of dust deposition monitoring is therefore required to assess compliance.

A sample with high ash content relative to the insoluble solids may be indicative of the influence of emissions from the facility.

Sample notes should be made at the time of collection each month, detailing the amount of water in the sample, presence of any insect/leaf matter/bird droppings, colour of the sample, clear evidence of sample contamination and anything else that may be of use for the interpretation of sample laboratory results.

Dust deposition rates are recorded at the following location at the facility:

- DDG2 – southwest corner of the site (licenced – EPL Point 1).

The location of the dust deposition gauge is shown in the DMP (see Appendix C).

Monthly results are collated into a spreadsheet for ongoing calculation of annual average for comparison to assessment criteria of 4 g/m^2/month (note: due to the proximity of the monitor to the site, 4 g/m^2/month would not be indicative of off-site sensitive receptors. Should complaints be received regarding dust from sensitive receptors, consideration will be given as to the installation of additional gauges in these locations). Sample observation notes are added to the results spreadsheet. In the event of an individual month ash result above the criteria, review of the sample ash content and sample notes will be conducted to determine if site operations are the likely contributing source.

Should the samples indicate that site operations were a contributing source, meteorological conditions and operations during that month will be reviewed, with the aim to identify the contributing emissions source or activity. Applicable management practices will be reviewed and improved as required.

Condition O6.3 of the EPL requires that a meteorological station is established and maintained onsite that complies with the requirements of the NSW EPA (2007). Should the weather station be non-operational due to outage or equipment failure, data shall be accessed from the Bureau of Meteorology's Prospect Dam weather station (site number 067019).

Contaminated samples are noted and excluded from annual average calculations.

The annual average and 12 month rolling average of deposited dust results will be reported annually as part of the EPL Annual Return and Annual Review.

In accordance with condition C15 of development consent SSD 6525, the facility shall also ensure compliance with any air quality limits in the EPL. However, there are no provisions for air quality limits in EPL 18815 and as such they have not been included in this OEMP.

5.3 Groundwater

A groundwater monitoring program (GMP) has been prepared for the site in accordance with C38, C39 and C40 of the development consent. The GMP is provided in Appendix D and is summarised in this section.

5.3.1 Performance criteria

The conditions relevant to groundwater in development consent SSD 6525 are as follows:

> C38. Within six months of the commencement of the expanded operations. The Applicant shall conduct a Groundwater Monitoring Program. The program must:

(a) be carried out by a suitably qualified and experienced expert in consultation with the EPA and to the satisfaction of the Secretary;

(b) assess the potential for leakage of the sediment basins to groundwater;

(c) detail baseline data, groundwater levels and quality against the relevant criteria;

(d) provide mitigation and contingency measures to prevent the sediment basins from leaking; and

(e) identify further groundwater monitoring if required.

C39. Within three months of the commencement of the Groundwater Monitoring Program, the Applicant shall submit a copy of the Groundwater Monitoring Program as identified in Condition C38 to the Secretary and EPA.

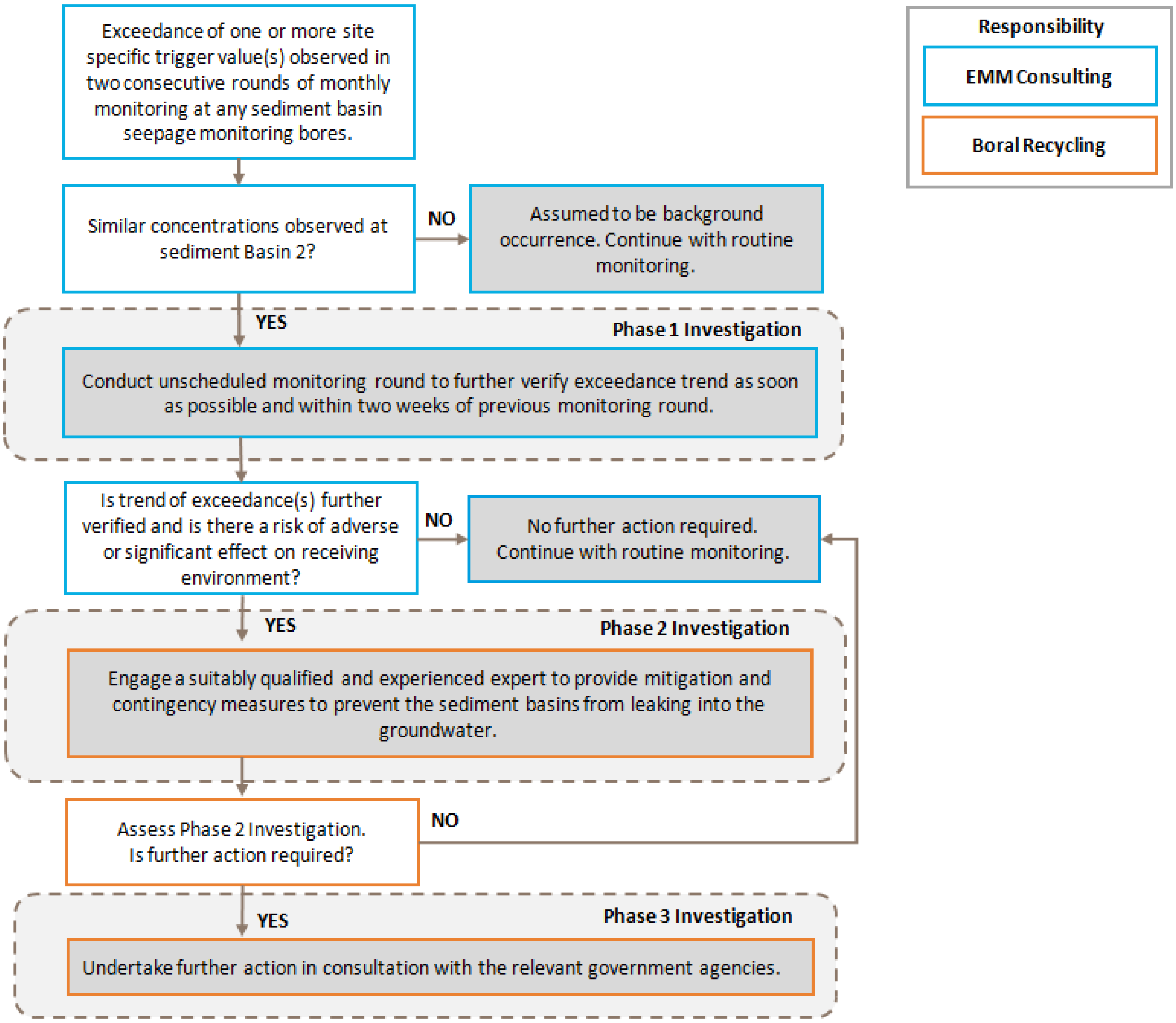
C40. The Applicant shall comply with any reasonable requirement(s) of the Secretary arising from the Groundwater Monitoring Program.

The GMP assessed the potential for leakage into the groundwater system to be negligible. Prior to the commencement of expanded operations, the requirement for site specific trigger values for ongoing groundwater monitoring will be assessed in consultation with relevant government authorities (NSW EPA) which will form the environmental performance criteria relevant for assessment of operations. As recommended by the *Australia and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ) (2000), site specific trigger values would be developed calculating the 80th percentile values (and the 20th percentile values where applicable).

5.3.2 Management and mitigation measures

The GMP assessed the potential for leakage into the groundwater system to be negligible. Therefore no groundwater mitigation measures have been recommended. The potential for sediment basin leakage will be reassessed as more data is collected. It is noted that the former clay liner for Sediments basins 1 and 2 was replaced with a HDPIE liner in 2019 in order to reduce the permeability of the basins and the likelihood of any migration of potential contaminants into the underlying groundwater system.

The GMP provides contingency measures for non-compliances detected during ongoing monitoring. It is proposed that a management response will be triggered if exceedances of any site specific trigger values occurs as described in the response action plan presented in Figure 5.2.



Exceedance of one or more site specific trigger value(s) observed in two consecutive rounds of monthly monitoring at any sediment basin seepage monitoring bores.

Similar concentrations observed at sediment Basin 2?

Assumed to be background occurrence. Continue with routine monitoring.

Conduct unscheduled monitoring round to further verify exceedance trend as soon as possible and within two weeks of previous monitoring round.

Is trend of exceedance(s) further verified and is there a risk of adverse or significant effect on receiving environment?

No further action required. Continue with routine monitoring.

Engage a suitably qualified and experienced expert to provide mitigation and contingency measures to prevent the sediment basins from leaking into the groundwater.

Assess Phase 2 Investigation. Is further action required?

Undertake further action in consultation with the relevant government agencies.

Figure 5.2 Groundwater response action plan

5.3.3 Monitoring environmental performance

The groundwater monitoring network at the site consists of a total of four monitoring bores, two deep monitoring bores targeting the uppermost water bearing zones within the site's surficial geology and two shallow monitoring bores to assess potential seepage from the sediment basins. Details of the monitoring bores are listed in Table 5.4.

Table 5.4 Groundwater monitoring bores details

Monitoring bore	Total depth (m bgl)	Total depth (m AHD)	Screened interval (m bgl)	Screened interval (m AHD)	Screened lithology	Purpose
MW01	25.5	14.95	17.5 – 23.5	23.0 – 17.0	Bringelly Shale	Regional groundwater level monitoring
MW02	11.0	28.16	3.0 – 9.0	36.2 – 30.2	Alluvial clay	Sediment basins seepage monitoring
MW03	11.0	28.54	3.0 – 9.0	36.5 – 30.5	Alluvial clay	Sediment basins seepage monitoring
MW04	29.0	18.33	20.0 – 26.0	27.3 – 21.3	Bringelly Shale	Regional groundwater level monitoring

Notes: m bgl = meters below ground level.
m AHD = meters Australian Height Datum.

Groundwater quality sampling has been conducted monthly from all four bores between January and May 2017. In accordance with the recommendations of the GMP (Appendix D), groundwater monitoring frequency will occur as two quarterly events from June/July 2021 until the commencement of the expanded operations. Once the expanded operations commence, groundwater monitoring frequency will increase to monthly for a period of six months. After these six months, the data collected will be analysed and interpreted to advise ongoing monitoring.

The recommended frequency of water quality sampling at the four monitoring bores and at Basin 2 is outlined in Table 5.5.

Table 5.5 Groundwater quality monitoring program

Monitoring phase	Monitoring frequency	
	Monitoring bores	***Sediment Basin 2***
Baseline		
January – May 2017	Monthly	January and February 2017
June/July 2021	Quarterly	
Expanded operations		
Six months from start of expanded operations	Monthly	Monthly
After six months from start of expanded operations	tbc	tbc

Notes: tbc = to be confirmed following review of monitoring data after six months of monitoring.

Within three months of completion of six months of initial monitoring during expanded operations, a groundwater monitoring report will be prepared in accordance with Condition C38 of the development consent. A copy of the groundwater monitoring report will be submitted to the Secretary and the EPA.

The groundwater monitoring report will include analysis and interpretation of groundwater quality, groundwater level and sediment basins data collected since monitoring began at all monitoring sites.

The groundwater monitoring report will also include a review of the monitoring network design and provide recommendations for ongoing monitoring, assess the adequacy of the monitoring network design, and assess whether additional monitoring bores are required.

5.3.4 Groundwater seepage investigations

Water quality results collected up to March 2017 (see Appendix M) indicate differences between water quality in the clay (seepage) monitoring bores (MW02 and MW03) and in the Ashfield Shale regional groundwater monitoring bores (MW01 and MW04).

A less clear distinction is observed between the seepage monitoring bores and the sediment basins. In summary:

- concentrations of arsenic, barium, copper, molybdenum, nickel and ammonia are detected at comparable levels; while
- concentrations of aluminium, chromium, vanadium, nitrite and nitrate are detected in the basins and not in groundwater; and
- concentrations of manganese and total phosphorus are detected at higher concentrations in groundwater compared to the basins.

Based on the available data, no clear conclusion could be made at this stage on the potential for seepage from the sediment basins and the influence of groundwater on the basins. No mitigation measures were required. Monitoring is ongoing following the sampling frequency and methodology prescribed in the GMP. It is noted that the former clay liner for Sediments basins 1 and 2 was replaced with a HDPIE liner in 2019 in order to reduce the permeability of the basins and the likelihood of any migration of potential contaminants into the underlying groundwater system.

5.4 Surface water

A surface water mitigation and monitoring plan (SWMMP) has been prepared for the site in accordance with Condition C41 and C42, Schedule C of the development consent, as well as EPL requirements for a Pollution Reduction Program (PRP). The SWMMP is provided in Appendix E and is summarised in this section. Note that the SWMMP is currently under revision in consultation with the EPA in order to address the requirements of the PRP.

The applicable PRP requirements under the EPL 11815 (U1) include:

- cessation of controlled discharge;
- a surface water characterisation assessment (SWCA);
- a surface water mitigation and monitoring plan (SWMMP); and

- a surface water validation report.

5.4.1 Performance criteria

i Discharges

Discharges from the site are permitted under EPL Condition L1.2 only when the preceding 5-day rainfall total exceeds 45 mm. No other controlled point source discharges are permitted in the EPL. As per PRP (EPL 11815 condition U1.1) controlled discharges are not permitted until the surface water validation report is completed and EPL 11815 is updated to reflect updated limit conditions.

The volume and mass limits to water discharges as specified in the EPL are shown in Table 5.6.

Table 5.6 Monitoring point locations

EPA identification number	Volume/Mass limit (kL/day)	Type of monitoring point	Location description
2	100	Discharge to waters Discharge quality monitoring Volume monitoring	Discharge outlet labelled "Stormwater Discharge Point" on map titled "Boral Recycling Plant EPL 11815 Licensed Monitoring Points" dated 11 June 2010.

Notwithstanding the above, Condition C41 of the development consent requires that the SWMMP must be prepared and approved by the Secretary in consultation with the EPA prior to any controlled discharges occurring under the EPL.

ii Water quality

The water quality concentration limits for monitoring specified in the EPL are given in Table 5.7.

Table 5.7 Concentration limits for monitoring/discharge points

Pollutant	Units of measure	50 percentiles concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
Oil and grease	milligrams per litre	-	-	-	10
pH	pH	-	-	-	6.5-8.5
Total suspended solids	milligrams per litre	-	-	-	50
Turbidity	nephelometric turbidity units	-	-	-	150

A surface water characterisation assessment (SWCA) has been prepared for the site as part of the PRP and is provided in Appendix H. Trigger values were established in the SWCA for each detected contaminant using the methods documented in the Australian and New Zealand Environment and Conservation Council (ANZECC) Guidelines (2000) for slightly-to-moderately disturbed ecosystems. These trigger values provide a conservative reference for water quality, below which levels are unlikely to cause environmental harm to a slightly-to-moderately disturbed watercourse. Water quality trigger values from the SWCA report are shown in Table 5.8.

Table 5.8 Water quality trigger values

Analyte	Trigger value	Units
pH	6.5-8.5	
Suspended solids	50	(mg/l)
Total Phosphorous	25	(ug/l)
Ammonia	20	(ug/l)
Nitrate (total NO_x)	40	(ug/l)
Total Nitrogen	350	(ug/l)
Aluminium (Al)	55	(ug/l)
Barium (Ba)	8	(ug/l)
Chromium IV (Cr)	1	(ug/l)
Copper (Cu)	2.9	(ug/l)
Strontium (Sr)	150	(ug/l)
Vanadium (Va)	6	(ug/l)
Hexavalent Chromium	1	(ug/l)
Fluoride	115	(ug/l)
Cyanide	7	(ug/l)
2-Methyphenol	13	(ug/l)
3, 4-Methyphenol	35	(ug/l)
2, 4-Dimethyphenol	2	(ug/l)
Aniline	8	(ug/l)
Carbendazim	0.5	(ug/l)
Anionin Surfactants	50	(ug/l)
Chlorine	3	(ug/l)

5.4.2 Human health risks

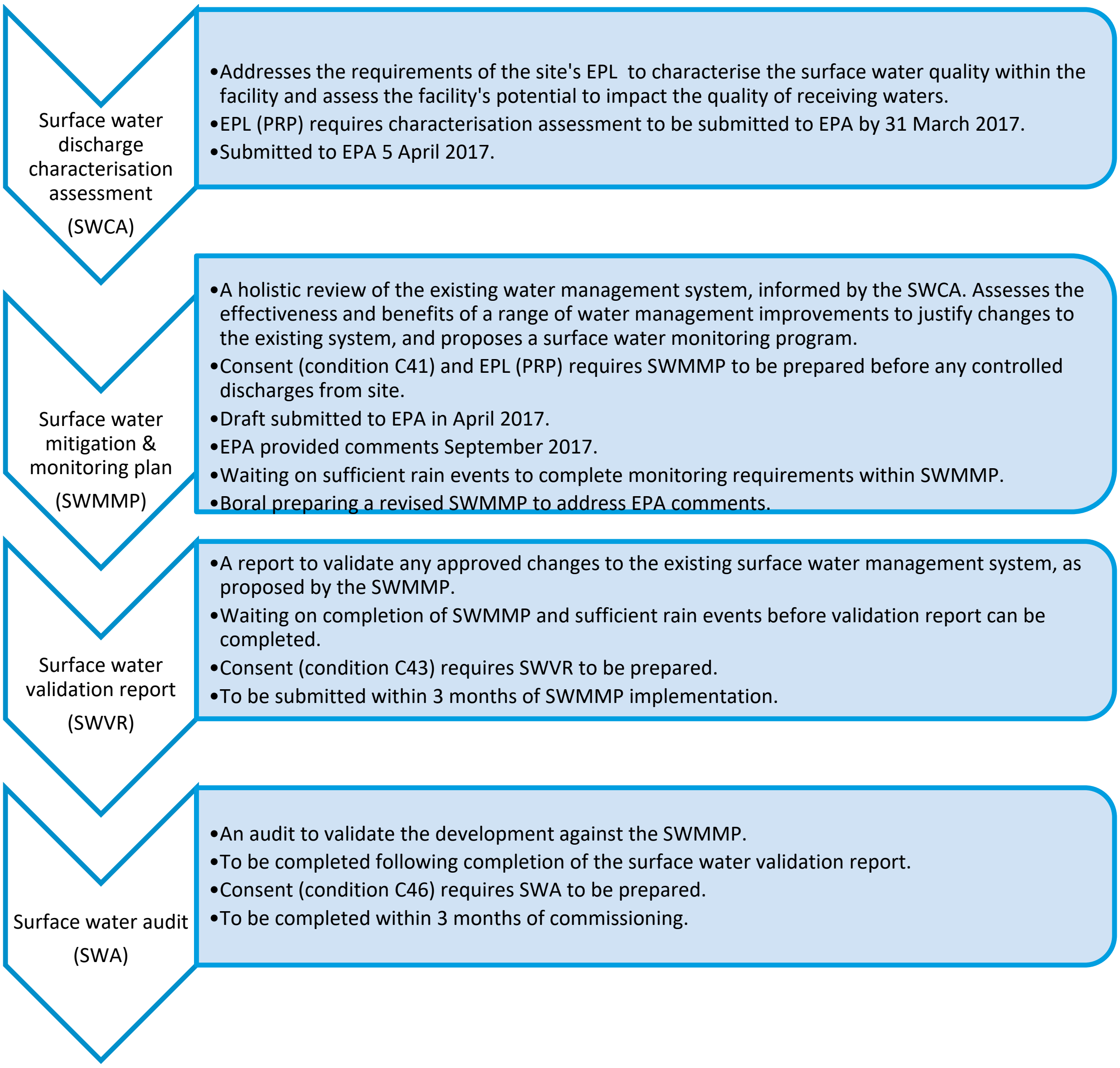
The SWMMP discusses human health risks associated with the use of water sourced from the site’s detention basins, in accordance with Condition C41 (f) of development consent SSD 6525. All process water is sourced from the onsite basins and is used for haul road, stockpile and conveyor dust suppression. The majority of the stockpile dust suppression is achieved using a water cannon that is mounted on a water cart.

Monitoring undertaken to inform the SWCA identified elevated counts of Total Coliforms (TC) and Total Plates (TP) in some of the basin samples, indicating there is potential for pathogens to exist in the process water. The facility currently irrigates the treated wastewater effluent to areas around the existing detention basis, which may cause elevated counts of TC and TP.

In response to this risk, Boral is investigating relocating the irrigation area and/or adding an appropriate disinfectant dosing system to the process water system.

5.4.3 Management and mitigation measures

A water management improvement plan has been developed to mitigate the surface water impacts of the site. The development consent SSD 6525 and EPL 11815 require Boral to prepare several water management documents including a surface water discharge characterisation assessment (SWCA), surface water mitigation and monitoring plan (SWMMP), surface water validation report (SWVR) and surface water audit (SWA). The water management documents, their timing and relationship between documents are detailed in Figure 5.3.



Surface water discharge characterisation assessment (SWCA)

- Addresses the requirements of the site's EPL to characterise the surface water quality within the facility and assess the facility's potential to impact the quality of receiving waters.
- EPL (PRP) requires characterisation assessment to be submitted to EPA by 31 March 2017.
- Submitted to EPA 5 April 2017.

Surface water mitigation & monitoring plan (SWMMP)

- A holistic review of the existing water management system, informed by the SWCA. Assesses the effectiveness and benefits of a range of water management improvements to justify changes to the existing system, and proposes a surface water monitoring program.
- Consent (condition C41) and EPL (PRP) requires SWMMP to be prepared before any controlled discharges from site.
- Draft submitted to EPA in April 2017.
- EPA provided comments September 2017.
- Waiting on sufficient rain events to complete monitoring requirements within SWMMP.
- Boral preparing a revised SWMMP to address EPA comments.

Surface water validation report (SWVR)

- A report to validate any approved changes to the existing surface water management system, as proposed by the SWMMP.
- Waiting on completion of SWMMP and sufficient rain events before validation report can be completed.
- Consent (condition C43) requires SWVR to be prepared.
- To be submitted within 3 months of SWMMP implementation.

Surface water audit (SWA)

- An audit to validate the development against the SWMMP.
- To be completed following completion of the surface water validation report.
- Consent (condition C46) requires SWA to be prepared.
- To be completed within 3 months of commissioning.

Figure 5.3 Water management documents flow chart

5.4.4 Monitoring environmental performance

A surface water monitoring program is implemented with the objective of collecting data to enable:

- the occurrence, duration and volume of site overflows to be estimated;
- the quality of surface water during overflow conditions to be characterised;
- the site water balance model to be progressively updated (as required); and
- compliance with EPL and consent conditions to be assessed.

The surface water monitoring plan framework and analytes that will be monitored are detailed in the SWMMP (refer Appendix E).

Surface water monitoring will include the following:

- rainfall monitoring at the on-site weather station;
- process water monitoring including water cart use and all other process water uses;
- water level monitoring in Dams 1 and 2; and
- water quality monitoring of the Dam 1 inflows and near the Dam 2 outlet.

An overflow event is defined as a period for which overflows occur from Dam 2. An overflow event may comprise intermittent overflows over a period of two to three days. An overflow event is considered to have ceased when no overflow has occurred for a period of 48 hours. A single sample is required for each overflow event.

Reporting for the surface water monitoring plan is detailed in the SWMMP (Appendix E).

5.5 Waste management

A waste monitoring program (WMP) has been prepared for the site in accordance with Condition C1, Schedule C of the development consent SSD 6525. The WMP is provided in Appendix A.

5.5.1 Performance criteria

Performance criteria for waste management relate to the volumes and stored quantities and type of waste permitted, as specified in the development consent SSD 6025 and EPL 11815. Relevant criteria are presented in Table 5.9 and 5.10.

Table 5.9 Volume and storage of waste

Aspect	Criterion
Volume of waste permitted on the site at any one time [1]	750,000 tonnes
Volume of waste permitted to be received per year	1,000,000 tonnes
Maximum stockpile height	20 m above ground level

Notes: 1. Unless approved in writing by the EPA.

The types of waste permitted to be received are shown in Table 5.10.

Table 5.10 Types of waste permitted under EPL 11815

Waste	Description	Activity permitted	Other limits
Waste concrete slurry from the company's concrete batching plants	Wet concrete batching plant stirrer waste.	Resource recovery and waste storage	N/A
Concrete, bricks and roof tiles	Tiles and masonry, including seconds materials direct from manufacturer.	Resource recovery and waste storage	N/A
Excavated natural material		Resource recovery and waste storage	N/A
Building and demolition waste	As defined in Schedule 1 of the POEO Act, in force from time to time.	Resource recovery and waste storage	N/A
Asphalt waste (including asphalt resulting from the road construction and waterproofing works)		Resource recovery and waste storage	N/A
Virgin excavated natural material	As defined in Schedule 1 of the POEO Act, in force from time to time.	Resource recovery and waste storage	N/A
Plasterboard and ceramics		Resource recovery and waste storage	N/A
Cured concrete waste from a batch plant		Resource recovery and waste storage	N/A
Soils		Resource recovery and waste storage	• Arsenic 40mg/kg; • Cadmium 2mg/kg; • Copper 200mg/kg; • Mercury 1.5mg/kg; • Zinc 600mg/kg; • Petroleum Hydrocarbons C6-C9 150mg/kg; • Petroleum • Hydrocarbons C10-C36 • 1600mg/kg; • Polycyclic aromatic • hydrocarbons 80mg/kg; • Polychlorinated biphenyls (individual) 1mg/kg. • No Acid Sulfate Soil or Potential Acid Sulfate Soil is to be received at the Premises. • Soil thresholds will be subject to review from time to time.
Garden waste	As defined in Schedule 1 of the POEO Act, in force from time to time.	Resource recovery and waste storage	Not more than 1,000 tonnes stockpiled on site at any one time.

5.5.2 Monitoring and management

i Waste receivals

Demolition and construction waste materials, as well as some quarry products for blending, are accepted at the facility.

Procedures to manage the type of waste entering the facility are outlined in this section. The objectives of the materials management procedures are to ensure materials are consistent with the permitted wastes under development consent SSD 6025 and the EPL, and to prevent contaminated materials entering the facility.

Materials received on site will be managed by:

- clearly communicating to customers the conditions of acceptance prior to material being transported to the facility;
- communicating the recycling inspection and receivals protocol to demolishers and contractors prior to entering site;
- undertaking independent checks on material origin prior to receival on site, including checking compliance in relation to material separation and handling;
- verification of source materials by obtaining appropriate clearance certificates (eg site clearance audits, asbestos clearance) where required; and
- monitoring and tracking of materials received on site by:
    - truck registration;
    - company name;
    - driver signature;
    - material origin; and
    - load weight from certified weighbridge.
- visual inspection of loads; and
- rejecting and recording unsatisfactory loads.

ii Outputs produced

Recycled saleable products from the site include:

- unbound base (UBB) (20 mm);
- densely graded base 20 (DGB20) (20 mm);
- 20 mm recycled aggregate;
- 10 mm recycled aggregate;

- pipe bedding (8 mm); and
- recycled 20 mm road base.
- Stabilised road bases

Natural quarry materials including 10 mm and 20 mm drainage aggregate are also imported to the site for blending, with some materials directly on-sold.

Products are sampled and tested to determine compliance to the POEO (Waste) Regulation 2014 – Resource Recovery Orders and Exemptions.

Product testing must adhere to an Inspection and Test Plan (ITP) which is provided in the inspection and receivals protocol (Appendix A).

The quantity and type of inbound and outbound products are recorded at the weighbridge and tracked through the Quarry Reporting System (QRS). This is Boral's auditable system used for tracking and reconciling product volume and movement updated daily and directly linked to weighbridge management system.

iii Other waste

Wastes not able to be recycled at the facility are either disposed of through licensed contractors or collected for recycling at other facilities. All waste receipts are stored on site.

Measures for management of other waste generated include:

- maintaining clearly marked separate bins for oil absorbent material and domestic garbage;
- steel and copper is recycled through licensed contractors;
- waste disposal through licensed contractors to licensed facilities; and
- waste dockets collected and stored on site.

The types of other waste generated on site, average quantities of waste and corresponding waste disposal services are summarised in Table 5.11.

Table 5.11 Outgoing waste products and disposal services

Waste type	Method of disposal	Disposal facility
General Rubbish (plastic, timber etc)	60–80 t/month	Bingo Industries
Steel	150–200 t/month	Sims Metal Management, St Marys depot
Copper	<5 t/month	Sims Metal Management, St Marys depot
Waste Oil	1500 L/6 months	Cleanaway
Waste Water (water from dams unable to be managed on-site)	Variable/6–12 months	Cleanaway
Oily rags	1x240 L bin/6 months	Cleanaway
Oil Absorbent Materials	1x240 L bin (as required)	Cleanaway
Waste Tyres	Removal by licenced contractor	TBC

5.6 Other environmental measures

5.6.1 Odour Management

There are no potential odour generating materials accepted on site. If any potential odour generating materials arrive at the weighbridge inspection point, they are identified and turned away and the relevant data is entered into the rejected loads register.

5.6.2 Traffic

Vehicles access the facility from the south, via Widemere Road, or from the north via Reconciliation Road. The facility has a transport code of conduct as well as a site specific traffic management plan. Signage is in place to assist vehicles entering and leaving the site including speed limits, tarping requirements and also parking requirements.

The following management measures will be implemented:

- all staff, contractors and drivers are to be made aware of the site Transport Code of Conduct (staff and contractors are informed through site induction, and drivers are provided with hard copy site's Transport Handbook with copies available at weighbridge, notice board and website);
- all vehicles entering and leaving the premises are to be made aware of designated traffic routes;
- loading and unloading of materials is to be conducted within the boundaries of the facility to ensure traffic is not disrupted;
- vehicle speeds on unpaved areas are to be kept to a practical minimum to avoid dust emissions, as outlined in Section 5.2 Air Quality;
- roadways are to be regularly watered to minimise dust; and
- no parking of vehicles will be permitted on public roads.

The following management measures will be implemented in accordance with Condition C53 of the development consent:

- no vehicles shall park or queue on the public road network;
- the realigned haul road has been constructed and maintained in accordance with the relevant Australian Standards;
- all vehicles are to be wholly contained on site before being required to stop;
- all loading and unloading of heavy vehicles is carried out on-site, in particular, all materials when first received at the site shall be unloaded at the receivals area in the north of the site;
- the proposed turning areas in the car park are kept clear of any obstacles, including parked cars, at all times;
- all heavy vehicles associated with the development have their loads covered and do not track dirt onto public roads;

- all vehicles enter and leave the site in a forward direction; and
- all vehicles exiting the site, which have accessed unpaved areas, shall depart via a wheel-wash facility.

5.6.3 Aboriginal and historic heritage

In the event that any Aboriginal cultural object(s) or human remains are uncovered on site all works on site are to be ceased. The NSW Police, the Aboriginal Community and the OEH are to be notified. Works shall not resume in the designated area until consent in writing from the NSW Police and/or the OEH has been obtained.

5.6.4 Visual amenity

The recycling facility is mostly screened within the site by existing landscape features and tree plantings. These include adjoining forests north and to the south of the site, and existing trees around the western boundary. The site is mostly visible from Reconciliation drive (looking from north to south) visible from the bus way to the south east.

The following management measures will be implemented:

- all external lighting associated with the Development shall be mounted, screened, and directed in such a manner so as not to create a nuisance to the surrounding environment, properties and roadways. The lighting shall be the minimum level of illumination necessary and shall comply with Australian Standard AS4282 1997 - Control of the Obtrusive Effects of Outdoor Lighting;
- no advertising signs will be installed on site without the written consent of the Secretary of DPIE;
- existing bund walls and tree plantings (note: the casuarina trees within and around the perimeter of the dam will be removed as part of the proposed dam improvements) will be maintained in good condition;
- visible dust will be minimised by use of water sprays on site; and
- stockpile heights are to be kept under 20 m (a One Point Lesson for stockpile heights is provided in Appendix L).

5.6.5 Security

Site security is important to implementing environmental management measures. The recycling facility is bounded by security fencing and is monitored through CCTV cameras around the site and also security patrols at night when there is no staff on site. Weekly inspections of site security controls are undertaken and any security issues are reported to the site manager.

Condition 59 of development consent SSD 6525 requires the following security measures are implemented for the site:

- install and maintain a perimeter fence and security gates on the site; and
- ensure that the security gates on site are locked whenever the site is unattended.

5.6.6 Refuelling

Refuelling procedures are necessary to ensure containment and clean-up of spills which could otherwise pollute waters. The refuelling of machinery and vehicles on site will be carried out from an self-bunded diesel tank and bowser on site. Refuelling will also be supplemented by a mobile tanker visiting the site, if required.

A designated bunded area for fuel storage and transfer appropriately sign posted is provided. Oil absorbent material will be kept on site and a suitable sized, lidded waste bin will be maintained on site to hold used absorbent for disposal to appropriate landfill. The bund has a drainage valve connected to an oil/water separator. To ensure that the valve is only open for draining waters, a lock out system is in place, so that whenever the valve is open the diesel bowser is locked out.

Management procedures for refuelling include:

- where reasonably practicable, refuelling is to take place in a designated hard stand area (this may not always be practical for refuelling of some equipment refuelled by mobile tankers. In these instances, appropriate spill control equipment must be available and undertaken in accordance with SWMS);

- all fuel tanks are bunded and can capture more than 100% of volume required;

- spill kits are available to clean up any potential spills;

- employees and tanker drivers are not to smoke during the transfer of fuel;

- the driver of the mobile refuelling vehicle must be present during the transfer operation;

- in the event of a spill, oil absorbent material will be used to soak up the spill, and the contaminated absorbent material will be placed in a Coopers brown bin for collection and disposal; and

- all potential spills will be reported to the site manager.

6 Communication

6.1 Communication and consultation

Communication both internally and externally allows Boral to provide and obtain information relevant to environmental compliance, including information related to its significant environmental aspects, environmental performance, compliance obligations and recommendations for continual improvement. Regarding complaints or negative information received from external sources it is imperative that a prompt and clear answer is provided by the site. Communication shall be conducted in accordance with GRP-HSEQ-2-02 Communication and Consultation with an emphasis that all communication adheres to the following points*:*

- transparent;
- appropriate;
- truthful;
- factual;
- include all relevant information; and
- be understandable by interested parties.

6.2 Reporting

The site reports on its environmental performance annually in accordance with EPL 11815 and development consent SSD 6525. The EPL annual anniversary date is 26 November, with the annual return due to the EPA within 60 days.

In accordance with Condition D9, Schedule D of the development consent, an annual review of environmental performance will be prepared for the site. The annual review will:

- describe the development that was carried out in the previous calendar year, and the development that is proposed to be carried out over the next year;
- include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, which includes a comparison of these results against the:
  - relevant statutory requirements, limits or performance measures/criteria;
  - requirements of any plan or program required under this consent;
  - the monitoring results of previous years; and
  - the relevant predictions in the EIS.

- identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;

- identify any trends in the monitoring data over the life of the development;

- identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies;

- describe what measures will be implemented over the next year to improve the environmental performance of the development; and

- First annual review will be completed by 30th January 2018 and will cover the period from 25th November 2016 to 24th November 2017, then annually thereafter.

6.3 Complaints and dispute resolution procedure

It is the responsibility of the site manager to document and act upon complaints received in relation to the facility's operation. A complaints register shall be maintained to enable:

- complaints/concerns received regarding the facility to be documented; and

- an appropriate response to complaints is initiated (this may include changing management practices/monitoring procedures or adopting new practices/monitoring procedures).

Complaints must be reported to the site manager within 24 hours of receipt. The site manager will log the complaint within the Safety and Environment Management System (SEQuence) and retain a copy on site within the site Environment Management System (EMS) folder. All complaints will be acknowledged within 24 hours of receipt by the site manager, where reasonably practical.

The person recording the complaint should provide the manager with the following information:

- date of the complaint;

- name of the person making the complaint;

- telephone number of the person making the complaint;

- reason for the complaint; and

- actions taken in response to the complaint.

Upon being informed of a complaint the manager must:

- determine whether any further response actions are required;

- determine whether changes to site management procedures/monitoring programs are required; and

- report the complaint in the EPA Annual Return.

As per Condition D12 Access to Information, the complaints register will be updated monthly (as required) on Boral's website.

6.4 Non-compliance

As per condition D5 of development consent SSD 6525, Boral shall notify, at the earliest opportunity, the Secretary and any other relevant agencies of any incident that has causes, or threatens to cause, material harm to the environment. For any other incident associated with the facility, the applicant shall notify the Secretary and any other agencies as soon as practicable after Boral becomes aware of the incident.

Within seven days of the date of incident, Boral shall provide the Secretary and any other relevant agencies with a detailed report on the incident and such further reports as may be requested.

An incident can be defined as, any incident causing or threatening harm to the environment, and/or an exceedance of the limits or performance of criteria in this consent.

Table 6.1 provides the performance criteria, non-compliance trigger and reporting actions for the main environmental aspects covered in Chapter 5.

Table 6.1 Non-compliance trigger table

Monitoring parameter/ incident	Performance criteria	Non-compliance trigger	Reporting actions
Incident causing or threatening harm to the environment	A pollution incident is required to be notified if there is a risk of 'material harm to the environment', which is defined in Section 147 of the POEO Acti as: (a) harm to the environment is material if: (i) it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or (ii) it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000 (or such other amount as is prescribed by the regulations), and (b) loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment.	As outlined in the PIRMP (refer Appendix J)	As per PIRMP (refer Appendix J)
Noise and Vibration	Condition C6 of SSD 6525 specifies that the Applicant shall ensure noise from the operation does not exceed the limits in Table 2 (ie Table 5.1 of this OEMP). Note 2: Noise generated by the development is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the INP.	Table 2 noise limits (dB(A)) from C6 (refer Table 5.1). If exceeded, first confirm there is no influence from meteorological conditions eg temperature inversions and wind speed.	If exceedance is confirmed, notify EPA and DPIE within seven days.
Air Quality	Condition C15 of SSD 6525 specifies that the Applicant shall ensure that the development complies with air quality limits in the EPL	No air quality limits have been specified in the EPL 11815.	None Trends of monitoring data will be presented in the Annual Review
Groundwater	N/A	N/A	N/A

Table 6.1 Non-compliance trigger table

Monitoring parameter/ incident	Performance criteria	Non-compliance trigger	Reporting actions
Surface Waters/ Discharges	Condition C23 of condition consent SSD 6525 specifies that any discharge or water quality criteria specified under the EPL must be complied with. Condition C25 of development consent SSD 6525 specifies that discharges or turbidity and/or suspended solids to waters from discharge point identified in condition EPL is only permitted when the discharge occurs solely as a result of rainfall at the premises exceeding a total of 45 millilitres over any consecutive 5-day period. Note that EPL 11815 currently prevents discharge occurring from site, as per condition U1.	Nil controlled discharge currently permitted Any controlled discharges	EPA immediately of becoming aware of the incident and DPIE within seven days.
Waste Management	Condition B7 of the development consent SSD 6525 specifies that the Applicant shall not cause, permit or allow any materials or waste generated outside the site to be received at the site for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by an EPL.	The facility will not knowingly* accept waste other than those listed within EPL 11815. Main risk is 'Asbestos Waste'	EPA immediately and DPIE within seven days.

*Notes: * While inspection protocols for waste entering the site are robust, due to the various forms of asbestos used in construction in the past, it is possible that occasionally small quantities can slip through unknowingly. The Asbestos Receival and Inspection Protocol details how asbestos risk is managed from demolition sources, weighbridge, offloading areas, throughout the crushing process and quality checks prior to sale to consumers.*

Further non-compliance reporting requirements, including internal and external contacts to notify in the event of an incident, are included and should be referred to in the PIRMP (refer Appendix J).

As the PIRMP is to be updated annually or after an incident or change in site contacts the PIRMP will remain separate from the OEMP. Any enactment of the PIRMP during the reporting period will be included in the annual review.

7 Incident and non-conformance response

Incidents and non-conformances are managed in accordance with Boral's GP-HSEQ-3-02 Incident Reporting Investigation and Action Management procedure. This section summarises the key sections of the HSEQ procedure.

7.1 Definition of incident

HSEQ incidents include, but are not limited to:

- injury to workers;
- damage to plant or property;
- near miss events (including dangerous incidents);
- quality (product or service) issues; and
- environmental non-conformances.

All incidents must be reported immediately to the Supervisor of the area where the incident occurred.

In accordance with Condition D5 of development consent SSD 6525 Boral will:

> notify, at the earliest opportunity, the Secretary and any other relevant agencies of any incident that has caused, or threatens to cause, material harm to the environment. For any other incident associated with the Development, the Applicant shall notify the Secretary and any other relevant agencies as soon as practicable after the Applicant becomes aware of the incident. Within 7 days of the date of the incident, the Applicant shall provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.

7.2 Procedure

These minimum mandatory requirements shall be implemented for all incident responses:

- all incidents shall be reported immediately to a Supervisor, and shall be recorded as defined;
- defined actions shall be taken to respond to any incident (ie manage the incident);
- all internal and external reporting, and notification requirements shall be met; and
- all HSEQ incidents shall be investigated to the defined risk level and actions identified, communicated and implemented to prevent recurrence.

During the induction process, visitors, contractors or other workers will be advised of who to contact if an incident (near miss or non-conformance) occurs or is suspected while they are visiting or engaged in work directed by the Company. A detailed incident management chart is provided in Appendix F.

7.3 Initial response to incidents

The first priority in response to an incident is to ensure that all affected persons are attended to and any person(s) requiring first aid or medical treatment are provided with that treatment as soon as possible.

Any first aid injuries shall be managed in accordance with GRP-HSEQ-4-05 First Aid Standard.

Areas subject to an incident investigation must be made safe and barricaded off (e.g. tape or other barrier) to preserve material relevant to any investigation.

The need to secure the scene may be under the direction of WHS or Environmental Authorities for serious incidents, with various conditions applied.

7.4 Incident reporting

The Operations and/or Site Manager (or delegate) must ensure that all relevant persons are informed of an incident within any prescribed or defined timeframes. A One Point Lesson document has been prepared for reporting environmental incidents at the facility and is provided in Appendix K.

7.4.1 Internal

Personnel with site safety and environmental responsibilities are provided in Table 4.2. Contact details for the relevant personnel are displayed on the site HSEQ notice board. Internal incident notification is incident specific. Detailed incident notification details are provided in GRP-HSEQ-3-02-A02 Incident Management Chart (see Appendix F).

7.4.2 External

The relevant Operations Manager or Site Manager, in consultation with the relevant HSE Advisor, must notify the Business Unit or Regional General Manager if the regulator or other external agenda is to be notified of an incident. Table 8.1 provides contact details for relevant external authorities that may require notification.

Refer to the GRP-HSEQ-2-09 Emergency Preparedness and Response Standard and the associated forms for any additional contact and procedural information.

7.5 Incident investigation

All incidents shall be investigated to a level commensurate with the risk. The purpose of all investigations is to identify:

- the cause or causes of an incident or non-conformance; and
- any preventive and/or corrective actions that once implemented are to eliminate recurrence of the incident or reduce the likelihood of a recurrence as far as reasonably practicable.

Responsibility for investigating incidents rests with the relevant Site Manager. The level of investigation depends on the type and severity of the incident or non-conformance. In general, higher risk incidents attract greater resources and formality in the investigation process, which includes specialist skills and methods. An investigation is to be carried out by a competent person or persons as soon as reasonably practicable after a notice of an incident or non-conformance has been received.

The findings of an investigation are to be recorded in SEQuence.

7.6 Corrective actions

Following an investigation, the incident investigator should consider corrective actions. Corrective actions deal with responding to the result of an incident. Preventive actions aim to prevent recurrences of similar events. Once the root cause(s) and contributory factors of an incident or non-conformance are established, corrective and/or preventive actions should be identified and implemented in response and to stop the incident or non-conformance from happening again.

Controls are to be selected from the Hierarchy of Controls and according to the GRP-HSEQ-1-03 Hazard Identification and Risk Management Standard. An investigator must consult with employees and other workers before finalising any corrective or preventive actions that may impact on operational controls in the workplace.

Furthermore, corrective and preventive actions must be assigned and prioritised (in order of most to least important) with an agreed time set to close them out. All corrective and preventive actions are to be recorded in SEQuence.

7.7 Closing incidents

Any nominated corrective or preventive action is to be verified for completion and effectiveness before an issue can be closed out, by the responsible manager.

SEQuence allows actions to be assigned and verified as completed as part of the reporting process.

Once an action is complete, the nominated employee is to send the issue to a nominated management representative to be verified and signed off. This will be defined in the database or through the assigned action in an incident spreadsheet.

When a non-conformance is corrected, the issue can be closed out by a nominated or required management representative.

Issue close outs are tracked in accordance with the GRP-HSEQ-3-01 Monitoring and Review Standard and by the Business Unit’s HSE Manager and/or Quality Manager. Any follow up requirements are initiated as they are identified.

7.8 Incident alerts

Incidents that may have broader consequences across the business should be communicated to the business using the HSEQ-2-02-F02 HSE Alert template or the HSEQ-2-02-F03 Quality Alert template, as appropriate.

Before distributing HSE and Quality Alerts, the appropriate HSE Manager or Quality Manager must approve them. All personal details of any injured person or party directly involved in a serious non-conformance must be kept confidential.

7.9 Incident response roles and responsibilities

Table 7.1 describes the roles and responsibilities for Boral personnel responsible for implementing the incident response procedure.

Table 7.1 Incident and non-compliance roles and responsibilities

Role	Responsibility
Recycling operations manager	• ensure all incidents are investigated and apply resources as needed; and • notify external regulator agencies (e.g. regulators, insurers) when an incident occurs and when required.
Regional Environmental Manager	• assist in the HSE and Quality incident response and investigation process, as required; and • communicate any necessary change(s) from corrective and preventive actions to the relevant authorising manager responsible for the procedure(s) within the Company HSEQ Management System.
HSE advisor NSW/ACT	• take part in the incident response and investigation process, as appropriate; and • recommend action on incident data and trends, as relevant.
Person identifying incident	• take immediate action — immediately notify one-up manager (notify Site Manager as a minimum).
Incident scene/senior manager	• contact Emergency Services (ambulance, fire brigade or police), when required; • preserve the incident scene; and • coordinate help where needed at the incident scene.
Incident team leader	• assess the risk. Decide and set up a structured approach to link data and activities on non-conformances; • initiate formal incident investigation using the approved Company template; • recommend final remedial, corrective and preventive actions to the Regional General Manager; and • communicate critical issue and findings to other businesses (as appropriate).
Employees	• report all incidents to the manager or supervisor as soon as they occur; and • complete the relevant sections in the Incident and Investigation Form as soon as possible.

Notes: 1. Responsible personnel are provided in Table 4.2.

8 Emergency response

An Emergency Response Plan (ERP) has been prepared for the site and is provided in Appendix I. This section summarises the key sections of the ERP.

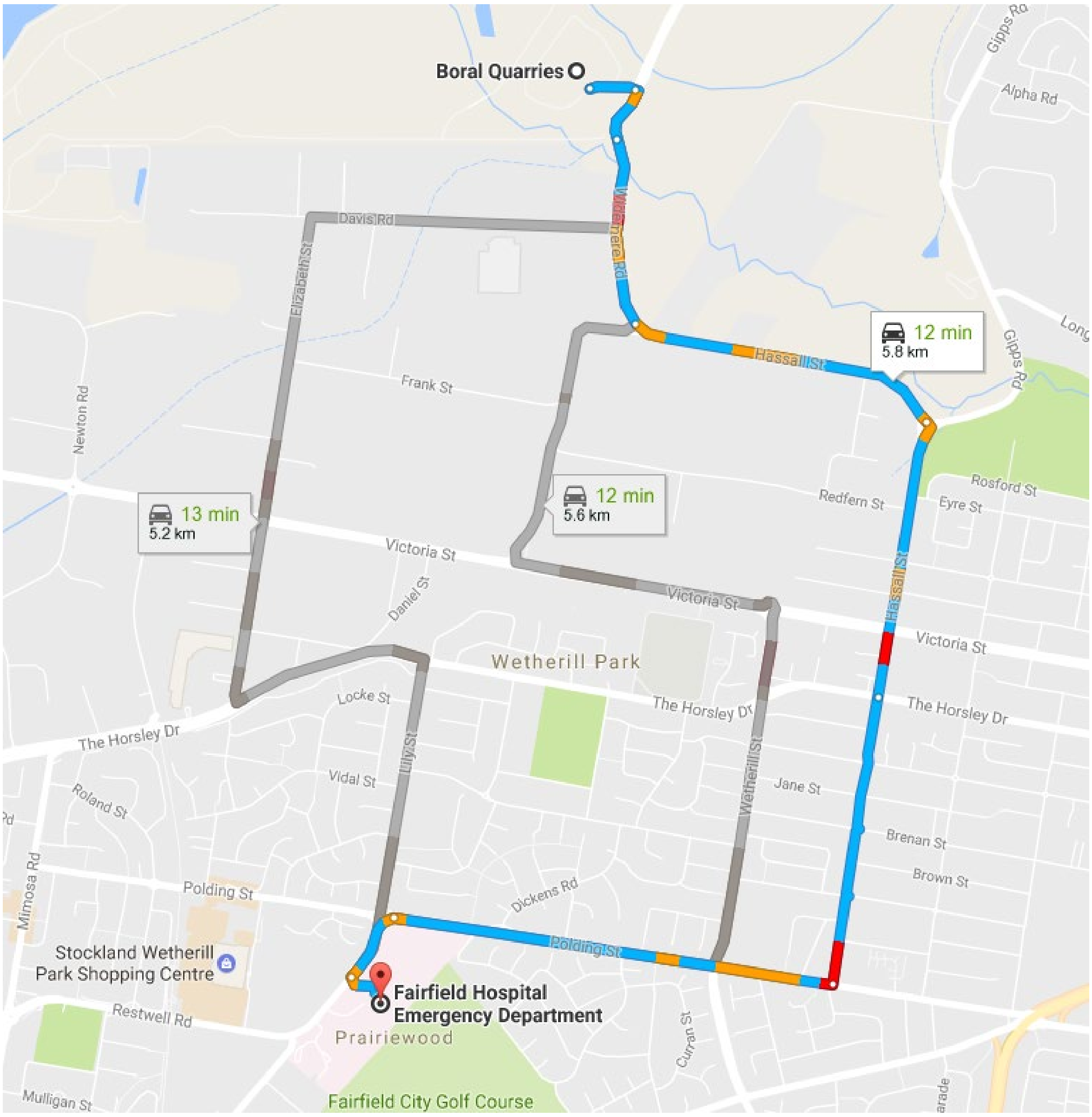
8.1 Notification

Table 8.1 provides contact details for external notification of emergency incidents.

Table 8.1 Emergency telephone numbers

Contact	Person/agency	Telephone
Emergency services	Fire, ambulance, police	000
Fairfield hospital	Casualty	(02) 9618 8111
Poisons Information Centre		13 11 26
EPA Pollution Incidents (24 hours)		131 555
Public Health Unit (Sydney West AHS)	Parramatta NC PHU	Healthlink (24 hours) – 1800 063 635 Head Office Parramatta – 9840 3603
SafeWork NSW		13 10 50 Company ABN if asked: 51 000 187 002
RMS		132 701
DPI Water		1800 353 104
Bush Fire Control Officer		1800 049 933
Poisons Information Centre		131 126
Endeavour (power line emergencies)		13 23 91
Fairfield City Council		(02) 9725 0222
City of Holroyd Council		(02) 9840 9840

A map showing the route from the site to Fairfield Hospital is shown in Figure 8.1.



Source: Google Maps (2017)

1. *head south on Prospect Hwy/Widemere Rd;*
2. *at the roundabout, take the 2nd exit onto Hassall St;*
3. *continue onto Gipps St;*
4. *at the roundabout, continue straight to stay on Gipps St;*
5. *turn right onto Polding St;*
6. *turn left onto Prairie Vale Rd; and*
7. *turn left.*

Figure 8.1 Route to Fairfield hospital

8.2 Emergency roles and responsibilities

Contact details for personnel with responsibility for management of emergency incidents are provided in Table 8.2.

Table 8.2 Main control staff and wardens

Emergency appointment	Emergency Control Organisation (ECO)	Stand in control staff (if ECO absent)
Chief Warden	Site Manager	Site Supervisor
Deputy Warden	Site Supervisor	Site Supervisor
Area Warden	Site Supervisor	Site Supervisor
Area Warden	Plant Leading Hand	Plant Leading Hand
Area Warden	Plant Leading Hand	Plant Leading Hand
Area Warden	Weighbridge	Weighbridge
Area Warden	Stab Plant Operator	
Area Warden	Receivals	
Communications Officer	Weighbridge	Administration Officer

8.3 Emergency response policy

All emergency situations must be managed in accordance with the GRP-HSEQ-2-09 Emergency Preparedness and Response Standard, and as required the GRP-HSEQ-2-10 Crisis Management Standard.

In the event of an injury, fuel spillage or other incident, the Boral Recycling ERP and Pollution Incident Response Management Plan (PIRMP) (see Appendix J) should be adopted.

Where emergency services are involved, company personnel shall act in accordance with their directions and requests, including preserving areas for investigation.

Any incident which may potentially harm the environment must be notified to the EPA. On site employees must be aware of the EPA License conditions.

Area Wardens must ensure that the ERP and PIRMP are kept in a prominent position and that all personnel are made aware of the contents. All personnel must make themselves aware of the location of all emergency alarms, exits and fire appliances within or near their work area and location of the external Safe Assembly Areas.

8.4 Procedure

In the event of an emergency the process to follow shall include:

- move people in immediate danger to safety, and ensure their continued safety and care;
- if safe to do so, provide assistance to injured persons;
- shut down or switch off appliances. LEAVE LIGHTS ON;
- report details to the Area Warden or Chief Warden immediately;
- restrict access to the area;
- care for injured personnel;

- await instructions from the Area Warden or Chief Warden;
- stand by to provide assistance, and await further instructions; and
- evacuation.

Detailed instructions for responses to specific emergency scenarios are provided in the ERP (see Appendix I).

8.5 Evacuation

In an emergency, an evacuation may be initiated in order to ensure the safety of personnel. The Chief Warden is responsible for determining if an evacuation is necessary and sounding a siren or other suitable warning system (ie two-way radio / CB radio) to alert all employees and visitors of the evacuation.

During an evacuation, all personnel must assemble at the designated Assembly Points (see Figure 8.2) and remain with their Area Warden at all times.

The stages of evacuation are:

- Stage 1 – Immediate – move away from immediate danger; and
- Stage 2 – Total – total evacuation of the premises.

Factors which must be considered to determine evacuation stages and priorities are:

- location and extent of the emergency;
- the proximity of flammable gases, liquids and other flammable materials or suspect item (in the case of a bomb threat);
- if there has been a toxic emission, evacuation must be kept away from direction of emission and wind;
- whether it is safe to try to extinguish the fire or block off smoke, or whether the initial attack on the fire looks like it will be successful;
- the nature and type of any injuries sustained by people in the danger area and whether those present are capable of evacuating all people in danger; and
- the nearest safe exit route.

In an evacuation the Area Warden responsible for each respective area will complete the evacuation checklist provided in the ERP (see Appendix I).

Entry or re-entry to the site following an evacuation is strictly forbidden until authorised by the Officer-in-Charge of the attending emergency authority. If no emergency authority is in attendance, entry or re-entry is forbidden until the Chief Warden gives the all clear and the Site/Operations Manager authorises re-entry.

Locations of emergency assembly areas, first aid kits and emergency equipment are shown in Figure 8.2.

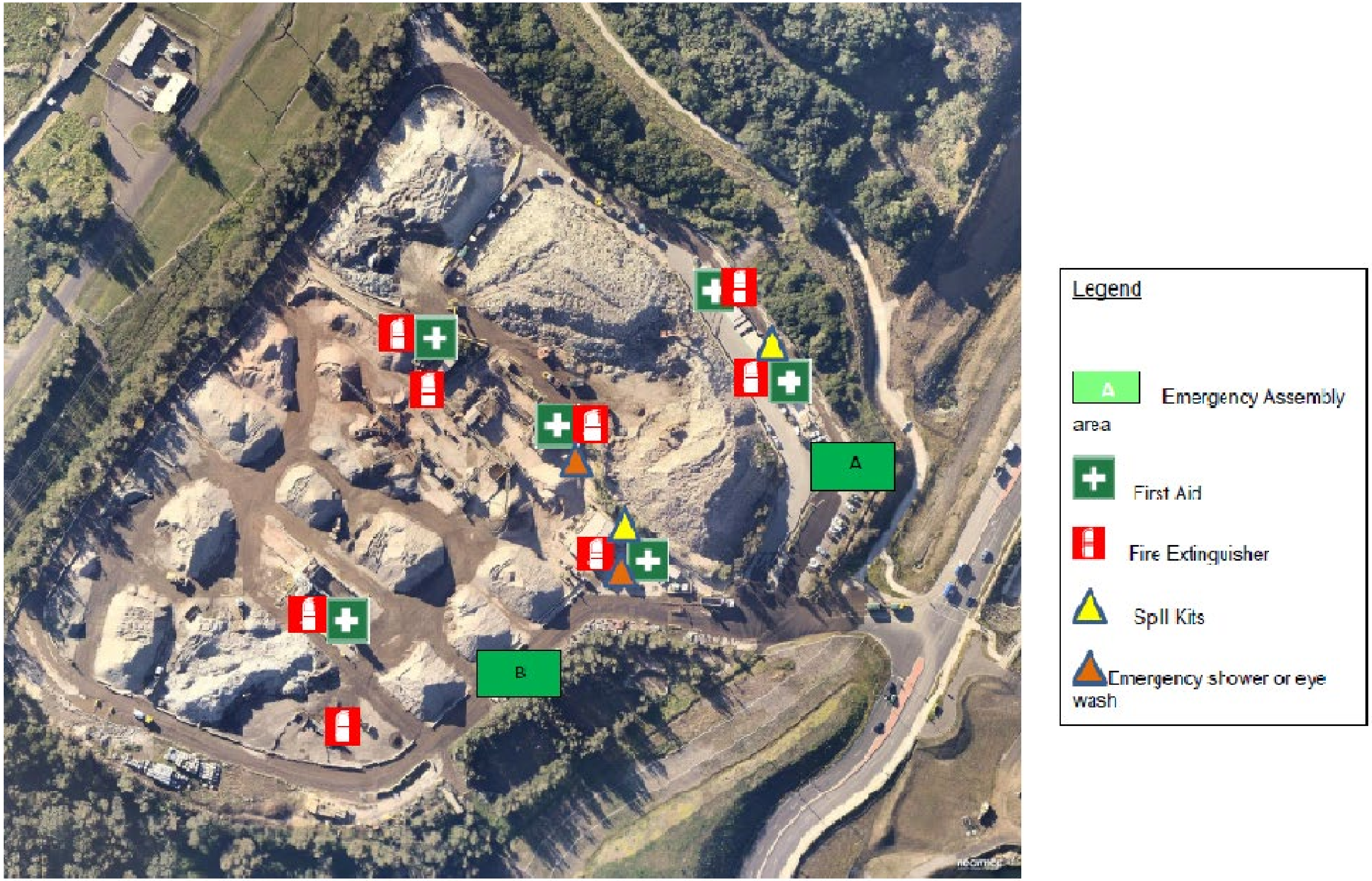


Figure 8.2

Emergency response site plan

9 Training and review

9.1 Training, competency and awareness

Training and inductions, including basic environmental awareness are provided to site staff and subcontractor staff as shown in Table 9.1 below. Training records will be maintained, and readily available in either hard copy and/or electric copy, as verification that personnel have received the appropriate training, and are competent to fulfil their roles.

The Boral HSEQ Elements, GRP-HSEQ-2-03 Training Competency and Awareness outlines the procedures and minimum mandatory requirements to ensure an effective system in place to manage training and competency of workers.

Table 9.1 Training requirements

Requirement	Who	When	Facilitated
Boral Group online induction (includes basic environmental awareness)	Self-facilitated online by employee and embedded contractors	At commencement of employment, and three yearly thereafter.	Online
Regional Facilitated Induction	Regional HSE Team	Commencement of employment with some components three yearly	Regional based induction - contact HSE team
Site/Business Unit Induction	Everyone - employees, contractors and visitors	Before commencing work on site, and yearly thereafter	By site staff
Environmental Awareness Training	For Supervisors and Managers	At commencement of employment in a supervisor role	Online
Asbestos Awareness Training	For All Employees	Within 4 months of employment, and yearly thereafter	By HIBBS & Associates

Notes: All levels of induction incorporate basic environmental awareness and all site inductions include an over view of site specific environmental aspects and legal obligations.

9.2 Monitoring and review

The Boral *GRP-HSEQ-3-01 Monitoring and Review* standard describes the obligations of all Boral sites to monitor and record the key performance characteristics of their operations, which have or may have a significant impact on the environment.

The review of this OEMP will be undertaken, at a minimum of every 3 years, or where there are significant changes to legislation. Reviews are to be conducted by the Environmental Manager in consultation with the Site Manager to ensure suitability and adequacy of the Operational Environmental Management Plan and associated compliances tools.

In accordance with Condition D10 of development consent SSD 6525 this OEMP is to be reviewed (and if necessary revised) within three months of submission of:

- an annual review;
- an incident report;
- an audit; or
- any modification to the consent.

9.3 Performance assessments and audits

In accordance with Condition D9 of development consent SSD 6525 an annual review of the site's environmental performance will be prepared and submitted to DPIE (see Section 6.2).

The site inspection and audit program is in accordance with GRP-HSEQ-3-03 Performance Assessments and Audits procedure. All records of inspections will be maintained electronically and/or in hard copy on site, audits are saved within the site's electronic system and/or SEQuence. Table 9.2 summarises the inspection, self-assurance and audit program for the site.

Table 9.2 Inspection, self-assurance and audit program

Type	Frequency	Responsibility	Criteria
EPP checklist	Monthly	Site manager	Checking off activity based environment actions from compliance obligations
Environment Inspection	As per site weekly inspection schedule	Site manager	Check off compliance requirements from legislations, housekeeping, HSEQ-MS minimum standards and identify areas of improvement
Compliance and EMS audit	As per regional audit schedule	Regional Environmental Manager	Environmental Compliance Audit against regulatory documents and EMS related elements from the Boral HSEQ MS

Appendix A

Waste monitoring program

Widemere Recycling Facility

Waste Monitoring Program

Prepared for Boral Resources Pty Ltd | 26 May 2021

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Widemere Recycling Facility

Final

Report J17038RP1 | Prepared for Boral Resources Pty Ltd | 5 April 2018

Prepared by	**Lawrence Wallis**	Approved by	**Brett McLennan**
Position	Environmental Scientist	Position	Director
Signature		Signature	
Date	26 May 2021	Date	26 May 2021

Document Control

Version	Date	Prepared by	Reviewed by
v01	5 December 2017	Lawrence Wallis	Kate Cox/Brett McLennan
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1 Introduction

1.1 Site description

Boral’s Widemere recycling facility processes demolition and surplus construction materials, particularly concrete and brick for re-use. The site is located off Widemere Road, Wetherill Park and has approval to process 1,000,000 tpa. Products produced by the site include recycled densely graded base (DGB), recycled aggregates (10 mm and 20 mm), recycled road base, unbound base, pipe bedding, sub-base (40 mm) and reclaimed asphalt pavement (RAP).

1.2 Purpose

This waste monitoring program (WMP) has been prepared for the Widemere recycling facility to provide site specific guidance about the waste management and monitoring systems used onsite. The objectives of this WMP are to:

- provide detailed information about site specific waste management; and
- satisfy the conditions of the site’s development consent SSD 6525.

The Operational Environmental Management Plan of which this WMP is a sub-plan, covers the entire Development and applies to a processing capacity at the facility of up to 1,000,000 tonnes per annum (tpa).

2 Roles and responsibilities

2.1 Responsibilities

Responsibilities of site personnal for the Widemere waste monitoring program are provided in Table 2.1 below.

Table 2.1 Waste monitoring program responsibilities

Role	Responsibility
Recycling manager	• initiating and implementing the inspection and receivals protocol; and • deliver annual asbestos awareness training for customers (in conjunction with receival account managers).
Recycling operations manager	• monitoring the ongoing operation of the inspection and receival procedure to assess its efficiency; and • initiating staff training.
Site manager	• implementing this WMP; • implementing the inspection and receivals protocol; • monitoring the ongoing operation of the waste monitoring program to assess its efficiency; • implementation of staff training including inductions; and • implementing the site based auditing process.
Receivals account manager	• where appropriate, visually monitor demolition sites and waste separation facilities, for compliance with industry best practices in material preparation, separation and handling; • inspecting demolition sites, where appropriate, to assess the suitability for recycling and to advise customers on what construction and demolition waste is accepted at Boral Recycling sites; • obtaining clearance certificates where asbestos has been identified within a customer's demolition site; • communicating to customers feedback on the quality of material received at the recycling plant, including rejected loads; • review rejected and overloaded load registers for non-conformance and opportunities to engage customers for continuous improvement; and • assisting the recycling manager with selecting customers for the annual formal asbestos awareness training for customers.
Weighbridge receivals clerk	• interviewing delivery drivers to identify the source of the material being delivered and noting this information; • visually inspecting, classifying and weighing/estimating each load for compliance as it arrives on the weighbridge; • rejecting loads that contain unexpected material containing asbestos (or suspect material) at the initial inspection and noting details of the customer in the rejected loads register; • issuing a docket for each load detailing material type and classification and issuing it to the driver; and • directing all conforming loads to the dedicated unloading area.
WOF spotter	• communicating with the driver to direct the load to the dedicated unloading area; • obtaining the docket from the driver to check the load has been initially inspected at the weighbridge; • instructing the driver to tip the load and conduct a second inspection for potential contamination; • where a WOF Spotter identifies material containing asbestos (or suspect material) in the load, follows the method for handling suspected contaminated materials (see Section 4.2.3); • when the load has been inspected and accepted, a WOF Spotter will sign the docket to signify that the second inspection has been carried out; and • collecting all dockets and delivering them to the weighbridge.

Table 2.1 Waste monitoring program responsibilities

Role	Responsibility
Plant operator	All plant operators on site will receive formal and ongoing asbestos awareness training and are to maintain vigilance for the presence of asbestos-containing materials (or suspect material) at any given location across the recycling process. This includes: • prior to incorporating recently tipped material into bulk stockpiles; • prior to and whilst pulverising material in preparation for feeding the plant; and • prior to feeding the plant.

2.2 Key personnel details

Details for Boral personnel and contractors responsible for implementing this WMP are listed below.

- Recycling manager;
- Recycling operations manager;
- Manager;
- Receivals account manager;
- Receivals clerk;
- Occupational hygiene consultants; and
- Asbestos removal contractor.

3 Regulatory requirements

3.1 Development consent

This WMP has been prepared to satisfy Condition C1 of the site's development consent SSD 6525. The WMP has also been prepared in general accordance with Condition D3 of development consent SSD 6525. The relevant conditions of development consent SSD 6525 and where they are addressed in this WMP are provided in Table 3.1 below.

Table 3.1 Conditions from development consent SSD 6525 relevant to the WMP

Condition	Detail required	Location in WMP
C1	The Applicant shall prepare a Waste Monitoring Program for the Development. This program must:	This document
a	be prepared in consultation with the EPA by a suitably qualified and experienced expert within 3 months of the date of this consent;	Front cover and certification page
b (i)	include suitable provision to monitor the: (i) quantity, type and source of waste received on site; and	Section 4.2
b (ii)	include suitable provision to monitor the: (ii) quantity, type and quality of the outputs produced on site.	Sections 4.3 and 4.4
c (i)	ensure that: (i) all waste that are controlled under a tracking system have the appropriate documentation prior to acceptance at the site; and	Section 4.2
c (ii)	ensure that: (ii) staff receive adequate training in order to be able to recognise and handle any hazardous or other prohibited waste including asbestos.	Section 7.1
C2	The Applicant shall carry out the Development in accordance with the Waste Monitoring Program approved by the Secretary (as revised and approved by the Secretary from time to time), unless otherwise agreed by the Secretary.	Section 1.2
D3	The Applicant shall ensure that the environmental management plans required under this consent are prepared in accordance with any relevant guidelines and include:	
a	detailed baseline data.	Section 4.1
b (i)	a description of the relevant statutory requirements (including any relevant approval, licence or lease conditions).	Chapter 3
b (ii)	a description of any relevant limits or performance measures/criteria	Section 3.2
b (iii)	a description of the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the Development or any management measures	Section 3.2
b (iv)	a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria	Chapter 4
c (i)	a program to monitor and report on the impacts and environmental performance of the Development	Chapter 4
c (ii)	a program to monitor and report on the effectiveness of any management measures	Section 5.1
c (iii)	a contingency plan to manage any unpredicted impacts and their consequences	Section 4.2.3
c (iv)	a program to investigate and implement ways to improve the environmental performance of the Development over time	Sections 4.2.1, 4.4.2 and 5.2
d (i)	a protocol for managing and reporting any incidents	Chapter 6
d (ii)	a protocol for managing and reporting any complaints	Section 5.2
d (iii)	a protocol for managing and reporting any non-compliances with statutory requirements	Chapter 6
d (iv)	a protocol for managing and reporting any exceedances of the impact assessment criteria and/or performance criteria	Chapter 6
d (v)	a protocol for periodic review of the plan	Section 7.3

3.2 Environment protection licence

Under the *Protection of the Environment Operations Act 1997* (NSW) (POEO Act) the site is a scheduled premise and is licensed for resource recovery and waste storage. Boral holds environment protection licence (EPL) 11815 for the site.

The EPL conditions relevant to the site's waste management are:

- The authorised amount of waste permitted on the premises cannot exceed 750,000 tonnes at any one time, unless approved in writing by the EPA.
- The Licensee must not receive or process on the Premises, more than 1,000,000 tonnes of waste per year.
- The height of any stockpile of any material on the Premises must not exceed 20 m above ground level.

The types of waste permitted onsite and the under the EPL are limited to those shown in Table 3.2 below.

Table 3.2 Types of waste permitted under EPL 11815

Waste	Description	Activity permitted	Other limits
Waste concrete slurry from the company's concrete batching plants	Wet concrete batching plant stirrer waste.	Resource recovery and waste storage	N/A
Concrete, bricks and roof tiles	Tiles and masonry, including seconds materials direct from manufacturer.	Resource recovery and waste storage	N/A
Excavated natural material		Resource recovery and waste storage	N/A
Building and demolition waste	As defined in Schedule 1 of the POEO Act, in force from time to time.	Resource recovery and waste storage	N/A
Asphalt waste (including asphalt resulting from the road construction and waterproofing works)		Resource recovery and waste storage	N/A
Virgin excavated natural material	As defined in Schedule 1 of the POEO Act, in force from time to time.	Resource recovery and waste storage	N/A
Plasterboard and ceramics		Resource recovery and waste storage	N/A
Cured concrete waste from a batch plant		Resource recovery and waste storage	N/A

Table 3.2 Types of waste permitted under EPL 11815

Waste	Description	Activity permitted	Other limits
Soils		Resource recovery and waste storage	• Arsenic 40 mg/kg; • Cadmium 2 mg/kg; • Copper 200 mg/kg; • Mercury 1.5 mg/kg; • Zinc 600 mg/kg; • Petroleum Hydrocarbons C6-C9 150 mg/kg; • Petroleum • Hydrocarbons C10-C36 • 1600 mg/kg; • Polycyclic aromatic • hydrocarbons 80 mg/kg; • Polychlorinated biphenyls (individual) 1 mg/kg. • No Acid Sulfate Soil or Potential Acid Sulfate Soil is to be received at the Premises. • Soil thresholds will be subject to review from time to time.
Garden waste	As defined in Schedule 1 of the POEO Act, in force from time to time.	Resource recovery and waste storage	Not more than 1,000 tonnes stockpiled onsite at any one time.

4 Waste monitoring and tracking

4.1 Existing waste processing

The site's processing capacity is limited to 1,000,000 tpa under EPL 11815 and development consent SSD 6525. At the time of writing the production quantities recorded in the latest Annual Environmental Management Report (AEMR) were:

- November 2019 – November 2020 = 674,011 t.

4.2 Waste received

4.2.1 Source sites

The Receivals Account Manager must communicate the importance of managing unexpected materials at the source to all customers as part of their ongoing customer management program. The Receivals Account Manager will visually inspect and monitor demolition sites and waste separation facilities, when appropriate, for compliance in relation to construction and demolition material separation, preparation and handling.

Clearance certificates are to be obtained for sites where asbestos has been identified and clearance certificates are required, or when it is otherwise deemed necessary by the Receivals Account Manager. Copies of all clearance certificates are retained in the site office.

4.2.2 Incoming materials

Upon arrival at the site, all material delivery trucks must report to the weighbridge. Once on the recycling site all demolition materials are inspected at least twice. The inspection regime is conducted in accordance with the Standards for Managing Construction Waste in NSW issued by the EPA. The receivals procedure is:-

i At the weighbridge office

- all customers delivering materials are identified and their details noted;
- all loads are inspected, classified, weighed and/or estimated prior to tipping. Where any unexpected materials containing fibrous material (or suspect material) is identified during this initial inspection the load is immediately rejected;
- loads rejected at the initial inspection are directed off site and the details noted in the "Rejected Loads Register";
- upon successful initial inspection, a three part docket is produced for the load; and
- the docket is signed by the Receivals Clerk as having been inspected on arrival and given to the driver to present to the "spotter" before tipping (a copy of the docket is retained at the weighbridge).

The Widemere weighbridge office is shown in Photograph 4.1.

Photograph 4.1 Widemere weighbridge office

ii At the raw feed stockpile area

- the driver hands the docket to the ‘working on foot’ (WOF) Spotter prior to tipping, this is proof the load has been inspected and weighed by the weighbridge Receivals Clerk;
- once the load is unloaded in the designated raw feed stockpile area the load is then visually inspected by the WOF Spotter;
- should any unexpected material containing fibrous material (or suspect material) be identified during this inspection, the load is immediately isolated and handled in accordance with the “method for handling suspected contaminated material” as outlined in the inspection and receivals protocol (see Appendix A);
- for all loads that pass the second point of inspection, the WOF Spotter will sign the docket to signify the further inspection has been carried out, the material has been accepted, and is suitable for inclusion into the raw feed stockpile; and
- a copy of the docket is then held at the site office for future reference.

The Widemere raw feed stockpile area is shown in Photograph 4.2.

Photograph 4.2 Widemere incoming raw feed stockpile area

4.2.3 Handling suspected contaminated material

Boral Recycling retains the services of occupational hygiene contractors, to advise us on matters relating to the safe handling of potential hazardous material in construction and demolition waste. The Widemere occupational hygiene contractor is:

- Hibbs and Associates Pty Ltd.

Contact details for Hibbs and Associated Pty Ltd are provided in Table 2.1.

The steps to be taken for handling potential contaminated material are as follows:

- The WOF Spotter will closely inspect tipped loads and may arrange for loader or excavator to spread load to assist in locating any potential unexpected materials containing fibrous materials (or suspect material). WOF Spotter may call for Supervisor to assist or make decision on any suspect materials identified in the load. Delivery trucks will be held onsite until the load has been tipped and the WOF spotter has inspected the load and given clearance for the truck to leave.

- If unexpected materials containing fibrous material (or suspect material) is found in the load, the material is to be wet down and loaded back onto the waiting truck. The dockets are then returned to weighbridge. The decision to reject the suspect load is the responsibility of Boral Recycling only and shall be final. The Receivals Account Manager will be contacted where necessary to provide an opportunity for the customer to be informed of the decision to reject the load.

- The truck details, including weights are checked by the Receivals Clerk for weight legality. Dockets will be cancelled, and the customer is to be notified. The details of the rejected load are then placed in the “Rejected Loads Register”. Dockets for rejected loads are to be scanned and a copy is kept onsite.

- If unexpected materials containing fibrous material (or suspect material) is found after a truck leaves the site, the load is to be wet down, isolated and marked with bollards and safety tape. Receivals Account Manager will contact the customer to request pick up of rejected load.

- If customer is unable or unwilling to pick up rejected load, Boral Recycling shall within 48 hours organise for an approved/licenced transport contractor to attend site to remove the contaminated load and transport to a licensed landfill. The details of the rejected load are then placed in the “Rejected Loads Register”. Dockets for rejected loads, including dockets confirming disposal of contaminated materials at licensed landfill, are to be scanned and copy kept on site. All costs associated with the clean-up of the area will be invoiced to the customer.

- Supervisors are to inspect the area surrounding the contaminated load after the load is removed to ensure no further contaminants are visible. Verbal approval is given by the Supervisor that the area is free from contamination and isolations can be removed.

- Appropriate PPE will be worn at all times whilst performing this work.

4.2.4 Tracking received waste

Copies of received load dockets are kept in the weighbridge and site offices.

A rejected loads register is maintained in the Widemere site office. Dockets for all rejected loads are to be placed in the rejected loads register.

The receivals account manager will use the rejected loads register to identify non-conformances and opportunities to engage customers for continuous improvement.

4.3 Other waste

Wastes not able to be recycled at the facility are either disposed of through licensed contractors or collected for recycling at other facilities. The types of outgoing waste and the contractors used for waste disposal are summarised in Table 4.1.

Table 4.1 Outgoing waste products and disposal services

Waste product	Average quantity/frequency	Disposal service
General Rubbish (plastic, timber etc)	60–80 t/month	Bingo Industries
Steel	150–200 t/month	Sims Metal Management, St Marys depot
Copper	<5 t/month	Sims Metal Management, St Marys depot
Waste Oil	1500 L/6 months	Cleanaway
Waste Water (water from dams unable to be managed on-site)	Variable/6–12 months	Cleanaway
Oily rags	1x240 L bin/6 months	Coopers Environmental

The site's sewage management is controlled by an Econocycle unit which is inspected and maintained routinely by a qualified contractor. Treated water from the system is used as non-potable water around the site to irrigate tree and shrub plantings.

Dockets for all outgoing waste products are obtained from the respective waste disposal services and are retained in the Widemere site office.

4.4 Outgoing products

4.4.1 Product types

Recycled saleable products from the site includes:

- unbound base (UBB) (20 mm);
- densely graded base 20 (DGB20) (20 mm);
- 20 mm recycled aggregate;
- 10 mm recycled aggregate;
- pipe bedding (8 mm);
- road base; and
- stabilised road bases including:
  - UBB;
  - pipe bedding;
  - DGB; and
  - road base.

Widemere Recycling also imports and sells natural quarry material:

- 20 mm drainage aggregate; and
- 10 mm drainage aggregate.

The quantity and type of outgoing products are recorded at the weighbridge and tracked through the Quarry Reporting System (QRS).

4.4.2 Testing for potentially hazardous material

Sampling of material produced onsite will be conducted on a weekly basis. After 12 consecutive satisfactory samples have been obtained the frequency of sampling will reduce to monthly. However, if the site receives a result that shows the presence of unexpected materials containing asbestos, then sampling will recommence weekly over a 12 week process.

A new stockpile sampling method is being prepared by Hibbs and Associates in consultation with the EPA. This section will be updated to reflect the new stockpile sampling method once it is developed.

The product sampling method is as follows:

- a front end loader bucket of material produced on the day, is to be taken and moved to a safe area for visual inspection and material sampling;
- employees with asbestos awareness training will undertake a visual inspection and complete a Take 5 form (Appendix B) confirming whether or not the processed product comprises of unexpected materials containing fibrous material. The completed Take 5 form will be kept in the site office in a folder labelled "Take 5 for Potential Hazardous Materials";
- if the visual assessment determines there is no signs of unexpected materials containing fibrous material, then sample the product in accordance with AS1141.3.1.9.2 – Sampling off a stockpile using a shovel. The sample (approximately 20 kg) is to be sent to Hibbs & Associates with a toe tag placed within the bucket for identification of the sample. The delivery address for Hibbs and Associates is Unit 48/378 Parramatta Rd Homebush NSW 2140. Hibbs and Associates contact details are provided in Table 2.1;
- if potential hazardous materials are detected by Hibbs & Associates then the material will be re-sampled and re-tested. Re-sampling of the material is to be performed as above. The site is to engage a hygienist to manage the potential hazardous material;
- if potential hazardous materials is found after re-sampling, a hygienist will be engaged to recommend an appropriate risk based management strategy which will be governed by the nature and extent of the contamination.

If the presence of unexpected material containing fibrous material (or suspect material) is found, production is to stop, and the Supervisor shall be notified. The site employees will complete a visual assessment across the face of the unprocessed raw feed and processed product. If it is deemed that the site is visually clear from potential hazardous material this will be documented by a completed Take 5 form before operations resume.

4.4.3 Recovered aggregate order 2014

Before blending into finished product, raw feed product is sampled and tested to determine compliance to the *POEO (Waste) Regulation 2014 – Recovered Aggregate Order 2014*.

Raw feed product testing must adhere to an inspection and Test Plan which is provided in the inspection and receivals protocol (Appendix A).

All raw feed product samples are to be labelled 'recovered aggregate'. The POEO (Waste) Regulation 2014 defines this as material comprising of concrete, brick, ceramics, natural rock and asphalt processed into an engineered material. This does not include refractory bricks or associated refractory materials, or asphalt that contains coal tar.

5 Communication

5.1 Reporting

The site reports on its environmental performance annually in accordance with EPL 11815 and development consent SSD 6525. The annual EPL anniversary date is 21 February, with the annual return due to the EPA within 60 days.

In accordance with development consent SSD 6525 an annual review of environmental performance will be prepared for the site. The annual review will:

- describe the development that was carried out in the previous calendar year, and the development that is proposed to be carried out over the next year;
- include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, which includes a comparison of these results against the:
    - relevant statutory requirements, limits or performance measures/criteria;
    - requirements of any plan or program required under this consent;
    - the monitoring results of previous years; and
    - the relevant predictions in the EIS.
- identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;
- identify any trends in the monitoring data over the life of the Development;
- identify any discrepancies between the predicted and actual impacts of the Development, and analyse the potential cause of any significant discrepancies; and
- describe what measures will be implemented over the next year to improve the environmental performance of the Development.

5.2 Complaints and dispute resolution

It is the responsibility of the site manager to document and act upon complaints received in relation to the facility’s operation. A complaints register shall be maintained to enable:

- complaints/concerns received regarding the facility to be documented; and
- an appropriate response to complaints is initiated (this may include changing management practices/monitoring procedures or adopting new practices/monitoring procedures).

Complaints must be reported to the site manager within 24 hours of receipt. The site manager will log the complaint within the Safety and Environmental Information Management System (SEQuence) and retain a copy on site within the site Environment Management System (EMS) folder.

The person recording the complaint should provide the manager with the following information:

- date of the complaint;
- name of the person making the complaint;
- telephone number of the person making the complaint;
- reason for the complaint; and
- actions taken in response to the complaint.

Upon being informed of a complaint the manager must:

- determine whether any further response actions are required;
- determine whether changes to site management procedures/monitoring programs are required; and
- report the complaint in the EPA Annual Return.

6 Incident and non-conformance response

6.1 Definition of incident

HSEQ incidents include, but are not limited to:

- injury to workers;
- damage to plant or property;
- near miss events (including dangerous incidents);
- quality (product or service) issues; and
- environmental non-conformances.

All incidents must be reported immediately to the Supervisor of the area where the incident occurred.

In accordance with Condition D5 of development consent SSD 6525 Boral will:

> notify, at the earliest opportunity, the Secretary and any other relevant agencies of any incident that has caused, or threatens to cause, material harm to the environment. For any other incident associated with the Development, the Applicant shall notify the Secretary and any other relevant agencies as soon as practicable after the Applicant becomes aware of the incident. Within 7 days of the date of the incident, the Applicant shall provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.

6.2 Procedure

These minimum mandatory requirements shall be implemented for all incident responses:

- all incidents shall be reported immediately to a Supervisor, and shall be recorded as defined;
- defined actions shall be taken to respond to any incident (i.e. manage the incident);
- all internal and external reporting, and notification requirements shall be met; and
- all HSEQ incidents shall be investigated to the defined risk level and actions identified, communicated and implemented to prevent recurrence.

During the induction process, visitors, contractors or other workers will be advised of who to contact if an incident (near miss or non-conformance) occurs or is suspected while they are visiting or engaged in work directed by the Company.

6.3 Initial response to incidents

The first priority in response to an incident is to ensure that all affected persons are attended to and any person(s) requiring first aid or medical treatment are provided with that treatment as soon as possible.

Any first aid injuries shall be managed in accordance with GRP-HSEQ-4-05 First Aid Standard.

Areas subject to an incident investigation must be made safe and barricaded off (e.g. tape or other barrier) to preserve material relevant to any investigation.

The need to secure the scene may be under the direction of WHS or Environmental Authorities for serious incidents, with various conditions applied.

Contact Boral Legal immediately for advice on more serious incidents, and particularly when WHS or environmental Authorities are likely to attend.

6.4 Incident reporting

The Operations and/or Site Manager (or delegate) must ensure that all relevant persons are informed of an incident within any prescribed or defined timeframes.

6.4.1 Internal

Contact details for personnel with site safety and environmental responsibilities are provided in Table 2.2. Internal incident notification is incident specific. Detailed incident notification details are provided in GRP-HSEQ-3-02-A02 Incident Management Chart.

6.4.2 External

The relevant Operations Manager or Site Manager, in consultation with the relevant HSE Advisor, must notify the Business Unit or Regional General Manager if the regulator or other external agenda is to be notified of an incident. Contact details for relevant external authorities that may require notification are provided in Table 6.1 below.

Table 6.1 Emergency telephone numbers

Contact	Telephone
Emergency services	000
Fairfield hospital	(02) 9618 8111
Poisons Information Centre	13 11 26
EPA Pollution Incidents (24 hours)	131 555
Public Health Unit (Sydney West AHS)	Healthlink (24 hours) – 1800 063 635 Head Office Parramatta – 9840 3603
SafeWork NSW	13 10 50 Company ABN if asked: 51 000 187 002
RMS	132 701
DPI Water	1800 353 104
Bush Fire Control Officer	1800 049 933
Poisons Information Centre	131 126
Endeavour (power line emergencies)	13 23 91
Fairfield City Council	(02) 9725 0222
City of Holroyd Council	(02) 9840 9840
Emergency services	000

Refer to the GRP-HSEQ-2-09 Emergency Preparedness and Response Standard and the associated forms for any additional contact and procedural information.

6.5 Incident investigation

All incidents shall be investigated to a level commensurate with the risk. The purpose of all investigations is to identify:

- the cause or causes of an incident or non-conformance; and
- any preventive and/or corrective actions that once implemented are to eliminate recurrence of the incident or reduce the likelihood of a recurrence as far as reasonably practicable.

Responsibility for investigating incidents rests with the relevant Site Manager. The level of investigation depends on the type and severity of the incident or non-conformance. In general, higher risk incidents attract greater resources and formality in the investigation process, which includes specialist skills and methods. An investigation is to be carried out by a competent person or persons as soon as reasonably practicable after a notice of an incident or non-conformance has been received.

The findings of an investigation are to be recorded in the Safety and Environment Information Management System (SEQuence).

6.6 Corrective actions

Following an investigation, the incident investigator should consider corrective actions. Corrective actions deal with responding to the result of an incident. Preventive actions aim to prevent recurrences of similar events. Once the root cause(s) and contributory factors of an incident or non-conformance are established, corrective and/or preventive actions should be identified and implemented in response and to stop the incident or non-conformance from happening again.

Controls are to be selected from the Hierarchy of Controls and according to the GRP-HSEQ-1-03 Hazard Identification and Risk Management Standard. An investigator must consult with employees and other workers before finalising any corrective or preventive actions that may impact on operational controls in the workplace.

Furthermore, corrective and preventive actions must be assigned and prioritised (in order of most to least important) with an agreed time set to close them out. All corrective and preventive actions are to be recorded in SIMS.

6.7 Closing incidents

Any nominated corrective or preventive action is to be verified for completion and effectiveness before an issue can be closed out, by the responsible manager.

The Company incident reporting database system(s) allow actions to be assigned and verified as completed as part of the reporting process.

Once an action is complete, the nominated employee is to send the issue to a nominated management representative to be verified and signed off. This will be defined in the database or through the assigned action in an incident spreadsheet.

When a non-conforming product is corrected, it must be re-verified to show that it conforms to the requirements. After action verification has completed, the issue can be closed out by a nominated or required management representative.

Issue close outs are tracked in accordance with the GRP-HSEQ-3-01 Monitoring and Review Standard and by the Business Unit's HSE Manager and/or Quality Manager. Any follow up requirements are initiated as they are identified.

6.8 Incident alerts

Incidents that may have broader consequences across the business should be communicated to the business using the HSEQ-2-02-F02 HSE Alert template or the HSEQ-2-02-F03 Quality Alert template, as appropriate.

Before distributing HSE and Quality Alerts, the appropriate HSE Manager or Quality Manager must approve them. All personal details of any injured person or party directly involved in a serious non-conformance must be kept confidential.

6.9 Incident response roles and responsibilities

Table 6.1 describes the roles and responsibilities for Boral personnel responsible for implementing the incident response procedure.

Table 6.1 Incident and non-compliance roles and responsibilities

Role	Responsibility
Recycling operations manager	• ensure all incidents are investigated and apply resources as needed; and • notify external regulator agencies (e.g. regulators, insurers) when an incident occurs and when required.
Environmental Manager NSW/ACT	• assist in the HSE and Quality incident response and investigation process, as required; and • communicate any necessary change(s) from corrective and preventive actions to the relevant authorising manager responsible for the procedure(s) within the Company HSEQ Management System.
HSE advisor NSW/ACT	• take part in the incident response and investigation process, as appropriate; and • recommend action on incident data and trends, as relevant.
Person identifying incident	• take immediate action — immediately notify one-up manager (notify Site Manager as a minimum).
Incident scene/senior manager	• contact Emergency Services (ambulance, fire brigade or police), when required; • preserve the incident scene; and • coordinate help where needed at the incident scene.
Incident team leader	• assess the risk. Decide and set up a structured approach to link data and activities on non-conformances; • initiate formal incident investigation using the approved Company template; • recommend final remedial, corrective and preventive actions to the Regional General Manager; and • communicate critical issue and findings to other businesses (as appropriate).
Employees	• report all incidents to the manager or supervisor as soon as they occur; and • complete the relevant sections in the Incident and Investigation Form as soon as possible.

Notes: 1. Contact details for all responsible personnel are provided in the Widemere Recycling OEMP.

7 Training and review

7.1 Asbestos awareness training

All Widemere personnel and site contractors are to receive both asbestos awareness training and removal of non-friable asbestos training. Personnel and contractors will receive training when they first commence work at Widemere recycling facility. Formal refresher asbestos awareness training will be held annually for all site personnel and contractors.

Through a review of customer performance records (eg rejected loads register, sales and receival daily reports, etc) Boral Recycling may invite selected customers to attend an annual formal asbestos awareness training program developed by an external industry expert.

In addition to staff and customer awareness training examples of restricted and prohibited wastes will be displayed at the weighbridge (see Section 3.0, Appendix A).

7.2 Auditing

Routine auditing will be undertaken to review the conformance of onsite waste management with this WMP and the inspection and receivals protocol. The site's waste auditing will include:

- an internal short form audit carried out by Boral Recycling staff once every month;
- a formal audit carried out by a suitably experienced representative of the Boral Recycling management team with assistance from Boral Health, Safety & Environment (HSE) representative at least once per year; and
- an external audit carried out by a suitably qualified consultant hygienist at least every two years.

7.3 Review of WMP

In accordance with Condition D10 of development consent SSD 6525 this WMP is to be reviewed (and if necessary revised) within three months of submission of:

- an annual review;
- an incident report;
- an audit; or
- any modification to the consent.

Appendix A

Inspection and Receivals Protocol

Boral Recycling

Inspection and Receivals Protocol

This protocol covers the Inspections and Receivals actions at Widemere and Kooragang Boral Recycling Facilities

Document Control			
Document Holder Name/Signature:		**Date:**	
Site:		**Document No.**	

Revision History

Revision	Reviewed Date	Approved by
Revision 1.1	28/1/2016	Charlie Bounassif
Revision 1.2	27/1/2017	Jason Sweeney
Revision 1.3	31/3/2018	Jason Sweeney
Revision 1.4	15/5/2019	Jason Sweeney
Revision 1.5	4/8/2020	Jason Sweeney

Contents:

Definitions

ACM	Asbestos-containing materials
Asbestos	Fibrous form of mineral silicates belonging to the serpentine and amphibole groups of rock-forming minerals, including actinolite, amosite (brown asbestos), anthophylite, chrysotile (white asbestos), crocidolite (blue asbestos), termolite, or any mixture containing one or more of the mineral silicates belonging to these groups
Contamination	Any unwanted substance found in waste materials
C&D materials	Construction and demolition materials received at the recycling facility
C&D waste facility	Construction and demolition waste facility within the meaning of clause 90B of the Waste Regulation
Customers	Any person or business entity delivering C&D waste materials to a Boral Recycling facility.
Embedded Contractors	Contractors that regularly interact with Boral Recycling directly engaged workforce and are under direct supervision by management and are directly involved in activities that may involve asbestos.
EPA	New South Wales Environment Protection Authority
Friable Asbestos	ACM that, when dry, is (or may become) crumbled, pulverised or reduced to powder by hand
Inspection Point 1	A weighbridge that is verified in accordance with Clause 36(3)(f) of the Waste Regulation
Inspection Point 2	A dedicated area located on a C&D waste facility after Inspection point 1 that is solely used for tipping, spreading, turning and inspecting each load of construction waste as required by Standard 1.2. This area must: - Have a combined minimum surface area of 100 square metres and large enough for each load to be tipped, spread, turned and inspected as required by Standard 1.2

	- Be clearly delineated form waste storage areas and other areas at the C&D waste facility - Be a hardstand constructed from material that is: clearly distinguishable from any waste being tipped; and capable of withstanding tipping, spreading and scraping waste, the load and frequency of incoming vehicles and machinery used at the C&D waste facility
Listed waste type	Waste types listed in Attachment A of the Standards for managing construction waste in NSW (Appendix 8)
Minimum Standards	Minimum Standards for managing construction waste in NSW set out by the EPA
Non-friable Asbestos	ACM that is not friable and reinforced with a bonding compound
PPE	Personal Protective Equipment – the equipment worn by workers to reduce their exposure to hazards and may include respirators, hard hats, safety boots, glasses, ear protection, overalls and the like
Recovered Fines Specifications	The requirements for recovering fines set out in the Recovered *Fines Alternative Daily Cover Specifications* made for the purpose of clause 12 (7)(c) of the Waste regulation
Rejected Load Register	Hard copy or electronic document held on-site at a C&D waste facility that records the details of each load of waste rejected from the facility in accordance with the Standards
Resource Recovery Order	An order made under clause 93 of the Waste Regulation which generators and processors must comply with in order to lawfully supply the waste for land application, use as fuel or in connection with a process of thermal treatment
Sorting	The separation of waste into individual waste types, waste which meets the requirements of a resource recovery order, or waste which meets the requirements of the recovered fines specifications
Suspect Material	Any load of waste material determined by suitably experienced Boral Recycling site representatives as 'suspected' to contain asbestos-containing materials (or any

	other fibrous materials) whether or not physical evidence of the same can be identified through visual inspection. In the event that a suspect load is identified, it will be treated as contaminated and rejected immediately. The final decision on classifying a load of waste as 'suspect' will remain with Boral Recycling site management.
Trained Personnel	Any person employed, contracted, engaged, or permitted to perform, manage or supervise tasks or duties at the C&D waste facility who has completed training under Standard 1.3
Unpermitted Waste	Waste not permitted by the C&D waste facility's environment protection licence to be received at the C&D waste facility
Vehicle	Includes a motor vehicle, trailer and any combination thereof
Waste Separation Facility	Any facility where waste streams are received, sorted and separated prior to the C&D waste being loaded and transported to a Boral Recycling Facility for further processing
Waste Storage Area (Inspection Point 3)	A dedicated space with clearly labelled or signposted stockpile areas (free-standing stockpile areas or enclosed bays) as required by Standard 4 of the Minimum Standards
Working on Foot	Refers to the Working on Foot (WOF) Program that has been developed to provide standardised and mandatory controls across all Boral Recycling operations for the receival of C&D materials

1.0 Inspection and Receival Protocol for Construction and Demolition Materials

1.1 Health, Safety and Environment

Boral Recycling aims to achieve excellence in all areas in our business with "zero" harm to our people, contractors, the environment, and the community.

At Boral Recycling,

Health and safety is non-negotiable

The health and safety of one's self and others comes before production.

Boral Recycling is a processor and employer with a responsibility to ensure we meet industry best practice in relation to the processing of construction and demolition materials.

1.2 The core elements of the protocol are:

- All Boral Recycling personnel and Embedded Contractors receive both asbestos awareness training and bonded-asbestos handling training as well as training required by the Standards for managing construction waste in NSW.
- All C&D materials received are inspected at least twice to minimise the risk of contamination from suspect ACM before it is incorporated into bulk stockpiles.
- All C&D material received is inspected and logged when complete.
- The system is audited internally and externally.
- Both internal and external Quality Control testing schedule for saleable products is in place.

1.3 This protocol covers:

- Asbestos awareness and bonded-asbestos handling training
- Protocol set out by the Standards for Managing Construction Waste in NSW
- Demolition site and waste separation facility inspections, monitoring and communication of handling enhancements to Customers
- Recycling site receival inspections and material re-handling procedures for rejected or suspect loads
- Quality Control Protocol
- Auditing of the protocol

1.4 Asbestos Awareness and Minimum Standards for managing Construction Waste in NSW Training

All Boral employees undertaking any tasks involved in meeting the requirements of the Minimum Standards, including the management and supervision, must be trained on

- Requirements of the POEO Act and its regulations
- The requirements of the Environmental Protection License for the site
- Requirements of these Standards

Boral training records will be kept in accordance with the Training Attendance Record (Appendix 6).

All Boral Recycling personnel and Embedded Contractors receive asbestos awareness training delivered by a qualified third-party occupational hygienist.

- Initial training and then refresher training every twelve (12) months.

Through a review of Customer performance records (e.g. Rejected Loads Register, Sales & Receival Daily Reports, etc) Boral Recycling may engage with customers to take part in a Customer awareness package covering the requirements of the Minimum Standards and Asbestos Awareness.

Boral Recycling retains the services of occupational hygiene contractors, to advise us on matters relating to the safe handling of potential hazardous material in C&D waste:

- Hibbs and Associates Pty Ltd

1.5 Rejected Loads Register

All Boral C&D waste facilities must keep and maintain a Rejected Loads Register (Appendix 1). The rejected loads register must be made available for inspection to an authorised officer of the EPA if requested. The rejected loads register must record the following details for each load of waste rejected from the C&D waste facility:

- The date and time in which the load of waste was rejected;
- The registration of the vehicle(s) and any accompanying trailers transporting the rejected load of waste both to and from the facility;
- The type of waste(s) in the rejected load of waste; and
- The reason the load of waste was rejected

1.6 Demolition and Material Source Sites and Customer Awareness

Boral Recycling recognises that if C&D materials are to be sustainably recycled, handling processes at all demolition sites and waste separation facilities need to be enhanced with the risk of suspect ACM managed at source by our Customers.

In response to this Boral Recycling retains Receivals Account Managers who will endeavour to communicate this Boral Recycling Inspection and Receival Protocol to our Customers prior to entering any Boral Recycling site and as part of their ongoing Customer management program.

The Receivals Account Manager visually inspects and monitors demolition sites and waste separation facilities, when appropriate, for compliance in relation to C&D material separation, preparation, and handling.

Where practical, clearance certificates are obtained for sites where asbestos has been identified and clearance certificates are required, or when it is otherwise deemed necessary by Boral Recycling Account Manager. A copy of the clearance certificate is retained at the Boral Recycling site.

Where appropriate, a customer awareness package will also be supplied to Boral customers detailing the Boral Recycling Inspection and Receival Protocol, Asbestos Awareness and the requirements of the Minimum Standards.

1.7 Recycling Plant Receival

Upon arrival at the site, all C&D material delivery trucks report to Inspection Point 1 (the weighbridge or office as per maps in Appendix 9). Any overloaded delivery trucks must adhere to the Safe Tipping Protocol for Overloads (located in the Widemere Safety ‘SWMS, SOP’s and Risk Assessment Folder’).

Once a C&D Truck has entered site, the procedure is then:

1.7.1 Inspection Point 1 (Initial Inspection at the weighbridge/office):

- All Customers delivering C&D materials are identified and their details noted.
- All C&D loads are inspected using an elevated inspection point, or a camera where an elevated point is not available, classified and weighed prior to tipping. Where

any suspected ACM (or any suspect or unpermitted waste) is identified during this initial inspection the load is immediately rejected.

- Loads rejected at the initial inspection are directed off-site and the details noted in the "Rejected Loads Register", as per Standard 1.4 of the Minimum Standards for managing waste in NSW.
- Upon initial success at Inspection Point 1, a docket is produced for the load, recording the details for the load. A docket is only printed for a load when the load has been accepted by the recycling facility.
- The driver is then directed to proceed with the load of waste directly to Inspection Point 2.

1.7.2 Inspection Point 2 (At the raw feed dedicated stockpile areas):

For all loads excluding those with previous exemptions (ie. Concrete washout and agitator waste as per Listed Waste Types in the Minimum standards, see Appendix 8):

- The WOF Spotter checks the docket prior to tipping, this is proof the load has been inspected and weighed by the weighbridge Receivals Clerk.
- Once the entire load is tipped in the designated Inspection Point 2 the surface area of the load is then visually inspected by person or camera.
- Should any suspected ACM be identified during this inspection, the entire load is rejected as per 1.2 of the Minimum Standards.
- Should any other unpermitted material be identified during this inspection, the load is immediately isolated, and the waste removed, or the entire load is rejected as per Standard 1.2 of the Minimum Standards.
- The load is then manually or mechanically turned, and the newly available surface area is visually inspected for any suspected ACM.
- Again, should any suspected ACM be identified during this inspection, the entire load is rejected as per 1.2 of the Minimum Standards.
- Should any other unpermitted material be identified during this second part of the inspection, the load is again immediately isolated, and the waste removed, or the entire load is rejected as per Standard 1.2 of the Minimum Standards.
- At any time during this process, each load of waste is not to come into contact with any other load of waste on the tip and inspection area, waste storage area or other working areas as detailed in Standard 1.2 of the Minimum Standards.

- For all loads that pass the second point of inspection, the WOF Spotter will complete the “Inspection Point 2 Load Register” to signify that the second inspection has been completed, the material has been accepted and is suitable for inclusion into the Waste Storage Area (Inspection Point 3).
- A copy of the docket is then held by Boral Recycling for future reference.
- Where the load is rejected under Standard 1.2 of the Minimum Standards, ensure the entire load is immediately reloaded onto the vehicle in which it arrived or onto another vehicle with the appropriate license. Ensure that the rejected load is removed from the Boral C&D waste facility within one working day and immediately record the details in the C&D waste facility’s Rejected Load Register as required by Standard 1.4 of the Minimum Standards.
- Where the load has been rejected and removed, the Inspections Area is to be inspected by a suitably trained Boral employee to ensure no further contaminants are visible prior to next load being set down. Verbal approval is then given that the area is free from contamination, isolations can be removed and work can continue.
- Appropriate PPE will be worn at all times whilst performing this work.
- Ensure that all waste that may be lawfully received at the C&D waste facility proceeds to be sorted and stored in accordance with Standards 2,3 and 4 of the Minimum Standards.

1.7.3 Waste Storage Area (Inspection Point 3)

All construction waste received at the C&D waste facility that has been inspected and sorted in accordance with Standards 1 and 2, is stored in accordance with the following requirements:

- Waste shall be stored in a separate storage area that is clearly identified as per the Inspection Area maps included in Appendix 9.
- Maps shall clearly identify Inspection Areas 1,2 and 3 and shall be placed in the Weighbridge, the daily toolbox meeting room or other areas as determined by the site manager.
- If waste is being stored outside of an enclosed bay, each stockpile of waste must be clearly delineated and separated from stockpiles of processed material by a minimum of three-metres from the base of the stockpile.
- Separate stockpiles containing the same listed waste type may touch at the base and are exempt from the three-metre separation requirement.

1.7.4 Mixing of Waste

Construction waste that has been inspected and sorted in accordance with Standards 1 and 2 is then processed and tested in accordance with the Recovered Aggregate Order (2014) to meet the Minimum Standards. To avoid contamination, once the waste has been processed it must be stored separately and must not be mixed with any other unprocessed construction waste at the C&D waste facility unless the other waste has been inspected and sorted at the C&D waste facility in accordance with Standards 1 and 2.

1.8 Auditing of the Protocol

Key to the effectiveness and usefulness of this protocol is for all stakeholders to have confidence that its process is being adhered to.

To ensure compliance, the following three-tiered auditing regime will be followed:

- The Task Observation against the Inspections Receivals Protocol will be carried out by Boral Recycling staff once every month (refer to Appendix 4). The audit will be part of the EAM (Electronic Asset Maintenance) system.
- A formal audit will be carried out by a suitably experienced representative of the Boral Recycling management team with assistance from Boral Health, Safety & Environment (HSE) representative at least once per year (refer to Appendix 5).
- A suitably qualified consultant hygienist will be engaged to carry out at least one audit every two years per recycling resource recovery facility.

1.9 Responsibilities and Accountabilities

This protocol applies to all construction and demolition material that is received at Boral Recycling NSW/ACT resource recovery facilities complying with the Minimum Standards for managing construction waste in NSW (EPA).

1.9.1 The Recycling Manager is responsible for:

- Initiating and implementing this procedure.
- In conjunction with Receival Account Managers through review of Customer performance, deliver a Customer Awareness Package that incorporates the relevant requirements of the Minimum Standards and Asbestos Awareness.

1.9.2 The Recycling Operations Manager is responsible for:

- Monitoring the ongoing operation of the procedure to assess its efficiency.
- Initiating staff training in the receival protocol and Minimum Standards.
- Ensuring the auditing process is complied with.

1.9.3 The Site Manager and Supervisor is responsible for:

- Implementing the protocol.
- Monitoring the ongoing operation of the procedure to assess its efficiency.
- Implementation of staff training including inductions.
- Implementing the site-based auditing process.
- Inspecting and maintaining the Waste Storage Area (Inspection Point 3)
    - Ensuring that waste is stored in accordance with 1.7.3 of this protocol.
    - Immediately moving any waste, which meets the requirements of a resource recovery order, found in an incorrect storage area to the correct storage area.
    - Recording observations, including each incidence of waste being identified in the wrong storage area, along with the date, time, the role and name of trained personnel carrying out the inspection.
        - These records must be kept in the C&D waste facility for a period of three years from the date of inspection in accordance with Standard 4.2.1.
- Completing a daily checklist detailing the responsibilities that must be carried out in the inspection.

1.9.4 The Supervisor Leading Hand is responsible for:

- Ensuring onsite compliance with the Inspections and Receivals Protocol
- Monitoring the ongoing operation of the Protocol and assess its efficiency

1.9.5 The Receivals Account Manager is responsible for:

- Where appropriate, visually monitoring demolition sites and waste separation facilities, for compliance with industry best practices in material preparation, separation and handling.
- Inspecting demolition sites, where appropriate, to assess the suitability for recycling and to advise Customers on what C&D waste is accepted at Boral Recycling sites.

- Where possible, obtaining clearance certificates where asbestos has been identified within a Customer's demolition site.
- Communicating to Customers feedback on the quality of material received at the recycling plant, including rejected loads.
- Review Rejected and Overloaded load registers for non-conformance and opportunities to engage Customers for continuous improvement.
- Deliver the Customer Awareness Package outlining the inspection and receivals protocol and the Minimum Standards.

1.9.6 The Weighbridge/Office Receivals Clerk at Inspection Point 1 is responsible for:

- Interviewing delivery drivers in accordance with the specified procedure to identify the truck registration, customer, product, and source of the material being delivered and noting this information.
- Visually inspecting, classifying, and weighing each load for compliance as it arrives on the weighbridge/site.
- Rejecting loads that contain suspect ACM or other unpermitted waste at the initial inspection and noting details of Customer in the "Rejected Loads Register".
- In the event of an overloaded vehicle, completing the Overloads Register and following the procedures set out in the "Safe Tipping Protocol".
- Issuing a docket for each load detailing material type and classification and issuing it to the driver.
- Directing all conforming loads to the dedicated unloading area.

1.9.7 The "WOF Spotter" at Inspection Point 2 is responsible for:

- Communicating with the driver to direct the load to the dedicated unloading area.
- Checking the docket from the driver to confirm the load has been initially inspected at the weighbridge.
- Instructing the driver to tip the load and conduct a second inspection for potential contamination.
- Ensuring the load is inspected in accordance with 1.7.2 of this protocol.
- Where a WOF Spotter identifies material containing suspected ACM in the load, following the Method for Handling Suspected Contaminated Materials (see Section 4.0 of the Inspections and Receivals Protocol).

- When the load has been inspected and accepted, a WOF Spotter will complete the Inspection Point 2 Register to signify that the load has been accepted and can be moved to Inspection Point 3 (Waste Storage Area, Raw Feed).
- Complete the Inspection Point 2 Register and delivering it to the weighbridge.

1.9.8 The Plant Operator is responsible for:

- All plant operators on site, having received formal and ongoing asbestos awareness training, will maintain vigilance for and report (to their supervisor) the presence of suspected ACM at any given location across the recycling process.
- Assisting with turning the loads for inspection at Inspection Point 2.
- Maintaining the Waste Storage Area (Inspection Point 3).

It is important that these steps are completed:

  - Prior to incorporating recently inspected material into Waste Storage Area (Raw Feed).
  - Prior to and whilst pulverising material in preparation for feeding the plant and
  - Prior to and during feeding the plant.

2.0 Receivals and Operations Process

2.1 Widemere Process

	
Step 1 – Inspection Point 1	**Step 2 – Inspection Point 2**
	
Step 3 – Inspection Point 3 (Waste Storage Area – Raw Feed)	**Step 4 – C&D Raw Feed processed**
	
Step 5 – Processed Raw feed loaded into crushing plant	**Step 6 – Picking Station**

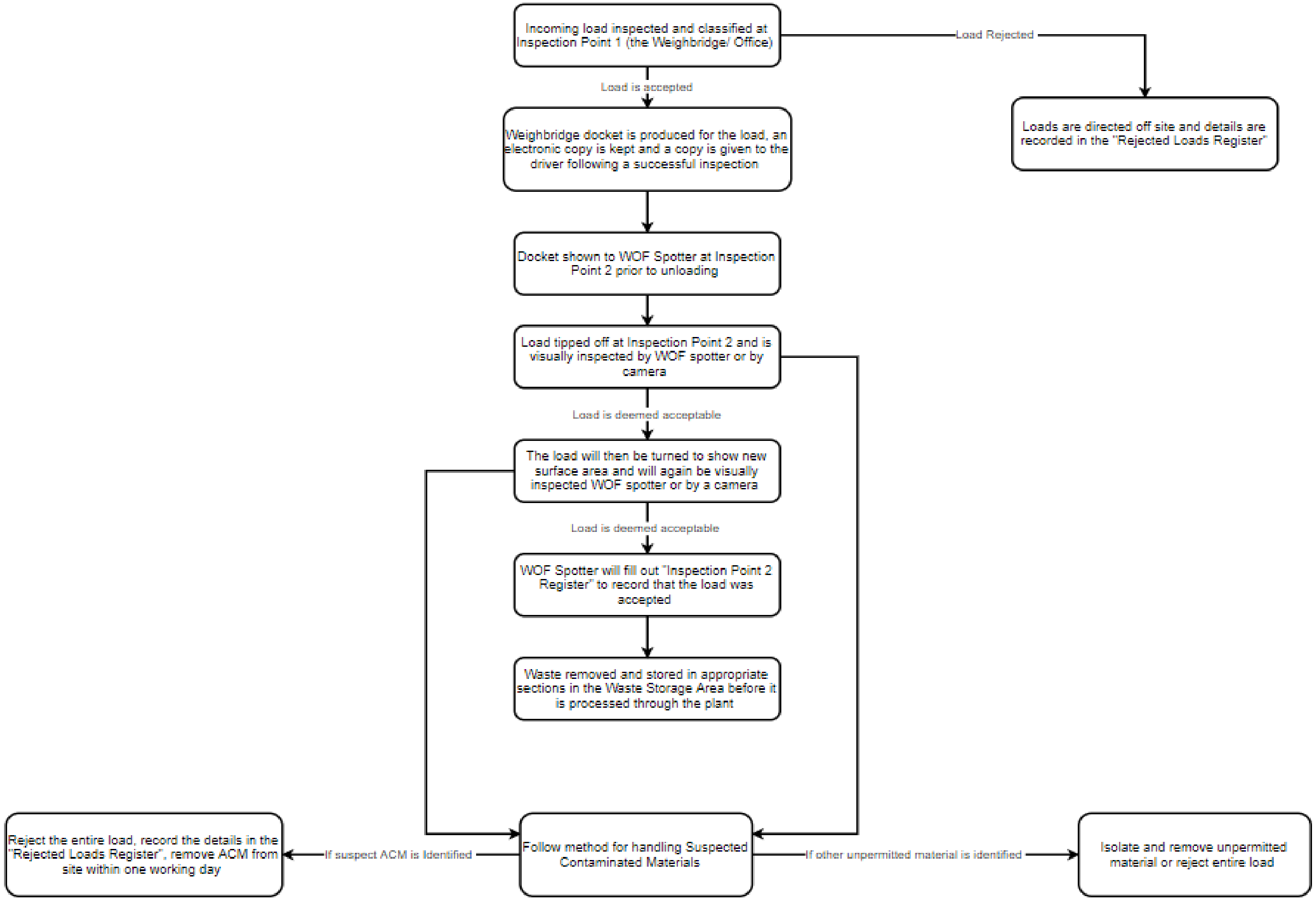
	
Step 7 – Processed material (saleable product)	**Step 8 - Inspection Point 3 (Waste Storage Area – Finished product)**
	
Step 9 – Loading of saleable product Loader	

2.2 Kooragang Process

	
Step 1- Inspection Point 1	**Step 2- Inspection Point 2**
	
Step 3 - Inspection Point 3 (Waste Storage Area – Raw Feed)	**Step 4– C&D Raw Feed processing**
	
Step 5- Processed Raw feed loaded into crushing plant	**Step 6- Processed material (saleable product)**

	
Step 7 - Inspection Point 3 (Waste Storage Area – Finished product)	**Step 8- Loading of saleable product Loader**

3.0 Inspection and Receival Flow Chart



4.0 Method for Handling Suspect Contaminated Materials

4.1 If suspect ACM is found in load, the load is to be rejected, material is to be wet down, loaded back onto waiting truck and weighbridge is notified. Rejected dockets are returned to the weighbridge as per normal procedure.

4.2 If any other unpermitted waste is identified, remove the waste or reject the entire load. The decision to reject the suspect load is the responsibility of Boral Recycling only and shall be final. The Receivals Account Manager(s) will be contacted where necessary to provide an opportunity for the Customer to be informed of the decision to reject the load and to reinforce the Inspections and Receivals Protocol.

4.3 The truck details, including weights are checked by the Receivals Clerk for weight legality. The dockets for the rejected loads will be recorded and the Customer is to be notified. The details of the rejected load are then placed in the “Rejected Loads Register”. Dockets for rejected loads are to be retained in scanned copy as required by Minimum Standard 1.4.

4.4 If suspect ACM is found post truck departing site, load is to be wet down, isolated and marked with bollards and safety tape. Receivals Account Manager to contact Customer to request pick up of rejected load under Standard 1.2 of the Minimum Standards.

4.5 If the load is unable to be reloaded onto the vehicle in which it arrived or Customer unable or unwilling to pick up rejected load, Boral Recycling shall, within one working day, organise for an approved/licenced transport contractor to attend site to remove the contaminated load and transport to an licensed landfill, in accordance with the Minimum Standards. The details of the rejected load are then placed in the “Rejected Loads Register”. Dockets for rejected loads, including dockets confirming disposal of contaminated materials at licensed landfill, are to be retained in scanned copy. All costs associated with the clean-up of the area will be invoiced to the Customer.

4.6 Area to be inspected by a suitably trained Boral employee after the load is removed to ensure no further contaminants are visible. Verbal approval is then given that the area is free from contamination and isolations can be removed.

4.7 Appropriate PPE will be worn at all times whilst performing this work.

5.0 Examples of Typical Asbestos Containing Material (ACM)

	
Photo 1 – Asbestos Cement conduit	**Photo 2 – Moulded Asbestos Cement product – Cable Tray**
	
Photo 3 – Flat Asbestos Cement sheet fragments	**Photo 4 – Membrane & Flashing containing Asbestos**

5.0 Examples of Typical Asbestos Containing Materials (ACM) cont.

	
Photo 5 – Old Train Block Fragments containing Asbestos	**Photo 6 – Fragments of Asbestos Cement sheeting on ground surface**
	
Photo 7 – Flat Asbestos Cement sheet fragments	

Signage boards shall also be visible at the weighbridge(s) for each Boral Recycling facility to provide further information on typical asbestos containing materials and the site protocols for inspection of ALL loads delivered by Customers.

6.0 Quality Control Protocol – Testing for Potential Hazardous Material

Boral Recycling material testing is conducted in accordance with the requirements and frequency of the Recovered Aggregate Order (RAO) and Exemptions (ROE) 2014. The Boral Inspection and Testing Protocol (ITP) exceeds the minimum requirements of the RAO and includes additional monthly testing for other ACM by an independent testing laboratory. Visual inspections are also conducted continuously throughout the day by various trained staff members including supervisors and lab technicians.

6.1 Asbestos Testing Method:

6.1.a A Front End Loader bucket of material produced on the day, at the scheduled sampling frequency, is to be taken and moved to a safe area for visual inspection and material sampling.

6.1.b Employees with asbestos awareness training will undertake a visual inspection & complete an assessment confirming whether or not the processed product comprises of suspect ACM.

6.1.c If the visual assessment determines there is no signs of suspect ACM, then sample the product in accordance to AS1141.3.1.9.2 – Sampling off a stockpile using a shovel. The sample (approx. 20kg) is to be sent to Hibbs & Associates with a toe tag placed within the bucket for identification of the sample.

6.1.d If potential hazardous materials are detected by Hibbs & Associates then resample the material and send to Hygienist to be retested. Resampling of the material is to be performed as per clause 4.1.b and 4.1.c. Site is to engage with the Hygienist to manage the potential hazardous material.

6.1.e If potential hazardous materials is found after resampling, A Hygienist will then be engaged to recommend an appropriate risk based management strategy which will be governed by the nature and extent of the contamination.

6.2 Asbestos Testing Frequency:

6.2.a Sampling will be conducted on a weekly basis. After 12 consecutive satisfactory samples have been obtained the frequency of sampling will reduce to monthly. However, if the site receives a result that shows the presence of suspected ACM, then sampling will recommence weekly over a 12 week process.

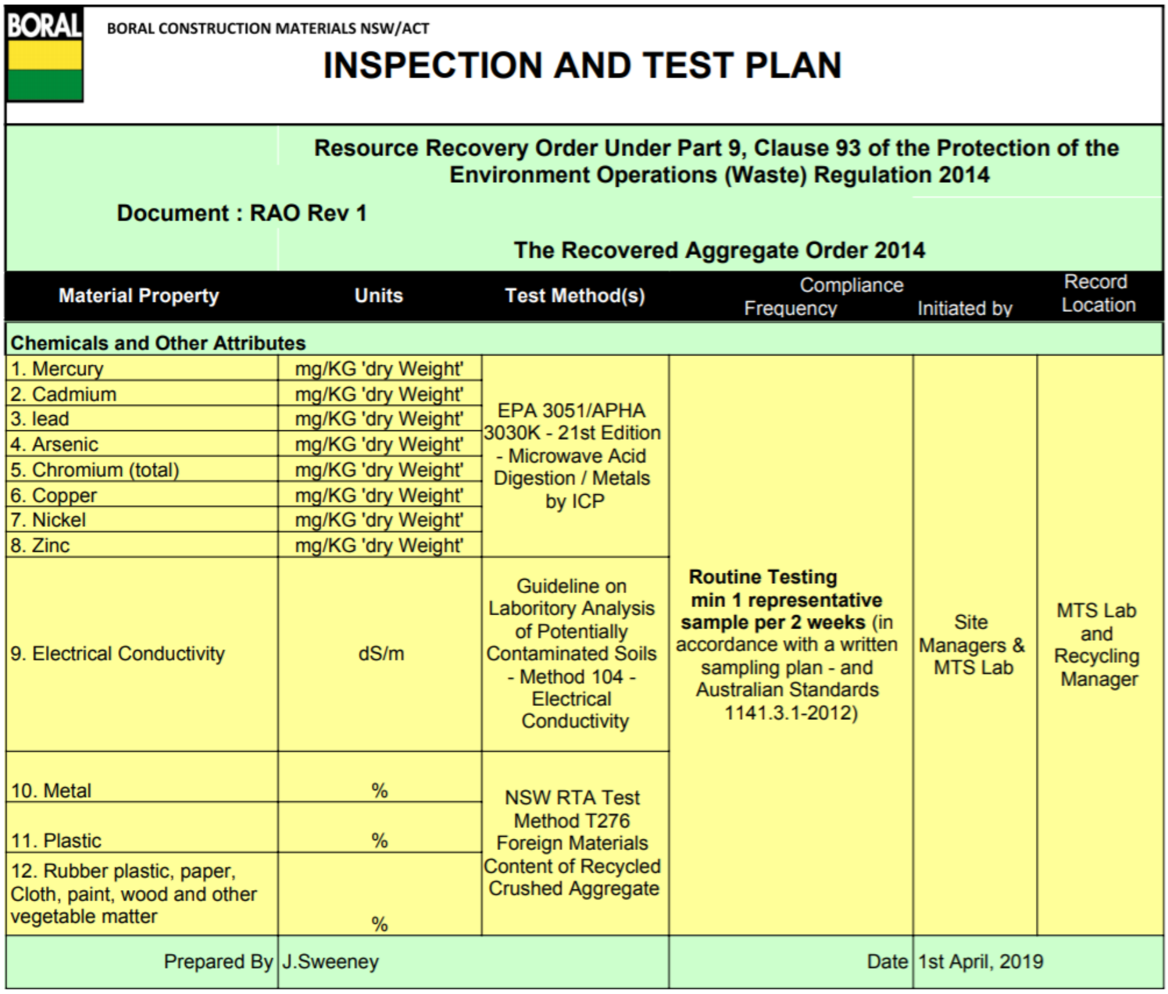
6.2.b If the presence of suspect ACM is found, production is to stop and the Supervisor shall be notified. The site employees will complete a visual assessment across the face of the unprocessed raw feed and processed product. If it is deemed that the site is visually clear from potential hazardous material (documented by a completed take5), then site continues its operation.

6.3 Delivery address for samples:

6.3.a Hibbs and Associates, Suite B, 255 Rawson St, Auburn NSW 2144
Phone: (02) 9746 3244.

6.4 Recovered Aggregate Order 2014

In relation to protocol compliance, raw feed product before blending into finished product is sampled and tested to determine compliance to the POEO (Waste) Regulation 2014 - Recovered Aggregate Order 2014. The following Inspection and Test Plan must be adhered to;



BORAL CONSTRUCTION MATERIALS NSW/ACT

INSPECTION AND TEST PLAN

Resource Recovery Order Under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014

Document : RAO Rev 1

The Recovered Aggregate Order 2014

Material Property	Units	Test Method(s)	Compliance Frequency	Initiated by	Record Location
Chemicals and Other Attributes					
1. Mercury	mg/KG 'dry Weight'	EPA 3051/APHA 3030K - 21st Edition - Microwave Acid Digestion / Metals by ICP	**Routine Testing min 1 representative sample per 2 weeks** (in accordance with a written sampling plan - and Australian Standards 1141.3.1-2012)	Site Managers & MTS Lab	MTS Lab and Recycling Manager
2. Cadmium	mg/KG 'dry Weight'				
3. lead	mg/KG 'dry Weight'				
4. Arsenic	mg/KG 'dry Weight'				
5. Chromium (total)	mg/KG 'dry Weight'				
6. Copper	mg/KG 'dry Weight'				
7. Nickel	mg/KG 'dry Weight'				
8. Zinc	mg/KG 'dry Weight'				
9. Electrical Conductivity	dS/m	Guideline on Laboritory Analysis of Potentially Contaminated Soils - Method 104 - Electrical Conductivity			
10. Metal	%	NSW RTA Test Method T276 Foreign Materials Content of Recycled Crushed Aggregate			
11. Plastic	%				
12. Rubber plastic, paper, Cloth, paint, wood and other vegetable matter	%				
Prepared By	J.Sweeney		Date	1st April, 2019	

Samples to be labelled “recovered aggregate” defined as material comprising of concrete, brick, ceramics, natural rock and asphalt processed into an engineered material. This does not include refractory bricks or associated refractory materials, or asphalt that contains coal tar. (Definition as per POEO Waste Regulations 2014)

7.0 Appendices

Appendix 1: Boral Rejected Load Register

Date	Month	Time	Boral Site	Docket Number	Docket Cancelled	Truck Type	Truck Rego.	Trailer Rego.	Rejection Inspection Point	Customer	Source	Rejection Reason

Appendix 2: Inspection Point 2 Register

Date:

Time	***Material Type***	***Truck and Trailer Rego.***	***Accepted (Y/N)***

Appendix 3: Contact Names and Telephone Numbers:

Name	Title	Office	Mobile
Jason Sweeney	Recycling Manager	02 9604 9101	0408 400 661
Angus Shedden	Recycling Operations Manager	02 9604 9101	0401 894 513
Widemere – Reconciliation Road Prospect NSW			
Adrian Preece	Site Manager	02 9604 9101	0401 894 981
Justin Ainge	Receivals Account Manager	02 9604 9001	0401 899 399
Weighbridge Operator	Receivals Clerk Widemere	02 9604 9101	
Kooragang – Egret Street Kooragang			
Richard Haskett	Site Manager	02 4920 1030	0401 894 967
Rebecca Brown	Receivals Account Manager	02 4920 1030	0401 893 546
Weighbridge Operator	Receivals Clerk	02 4920 1030	
Consultants			
Hibbs & Associates	Occupational Hygiene Consultants	02 9746 3244	
Ross Mitchell Mitchell & Associates	Asbestos Removal Contractor	02 9642 0011	0418 215 076

Appendix 4: Internal Audit – Task Observation against Inspection and Receival Protocol

Task Observations against Inspection and Receival protocol[1]

Observer:	**Task:**	**Date:**	**Time:**
Observed:	**Site:**	**Area:**	

Announce – Explain the Task Observation process to worker & confirm the following (circle Yes, No or n/a)	
Have the employee completed the Boral 2 day Induction? Yes / No	Has the employee been inducted to this work site within the last 12 months? Yes / No
Is there a written procedure for this task? Yes / No	Have they signed onto SWMS for task? Yes / No / n/a

Is the Inspection & Receivals Protocol current?	Yes / No / n/a
Has the employee been trained in the Inspection & Receivals Protocol	Yes / No / n/a
Has the employee received asbestos awareness and removal of non-friable asbestos training?	Yes / No / n/a
Has the employee received the full Working on Foot training program?	Yes / No / n/a
Has the employee been trained in all risk assessments/SWMS associated with the Inspection and Receival Protocol and Minimum Standards for Managing construction waste in NSW?	Yes / No / n/a
What is the procedure for handling suspected contaminated material? Was answer appropriate?	Yes / No / n/a
Does the site comply with the Method for Handling Suspected Contaminated Materials?	Yes / No / n/a
How were your competencies confirmed & were they able to be verified? Was answer appropriate	Yes / No / n/a
Do you know where to find written instructions for working activities associated with the inspection and receival protocol?	Yes / No / n/a
If there was a new hazard you identified in the task, what would you do? Was answer appropriate?	Yes / No / n/a
What communication do you perform before, during & after this task? Was answer appropriate?	Yes / No / n/a
What would you do if you noticed an unsafe behaviour by someone else? Was answer appropriate?	Yes / No / n/a
Check with supervisor - Are they fit for the task?	Yes / No

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[1] Task Observations are a constructive approach to identify and address issues and reinforce positive behaviours.

Appendix 4 cont.

<u>W</u>atch – Observe task completion. **<u>A</u>sk** questions throughout to clarify as required

Mark "√" for positive observations, "X" for concerns/issues and "-" if not applicable. Add comments below.

PPE		**Receivals Area**		**Behaviours**		**Movement**	
Glasses/goggles		Pre-start check completed		Eyes on task		Repetitive	
Safety boots		Emergency preparedness		Standing in safety zone		Communicating movement	
Gloves		Adequate lighting		Manual handling		Standing with back to stockpile	
Hi-vis shirt/Long / longs		Two way radio functional		Frustrated / confused		Visual contact with HME	
Hard hat		**Plant & Equipment**		Rushing			
Hearing protection		Pre-start check completed		Complacent			
Dust mask		Isolation trained		Communicating		**Work Practices**	
Whistle		Other-		Hazard identification		Take 5 / SWMS / SOP	
LED Hi-Viz vest				Fatigue		Reporting - Haz / Inc / Env	
LED Baton				Aware other work groups		Traffic management	
Environmental		**Housekeeping**		Consider zero/one/ten		Communication	
Air – (dust)		Designated areas- equipment		Other-		WoF Protocol	
Land – (oil spills)		Bins available		**Administration**		Quality control Protocol	
Noise		Area clean and tidy		Rejected Load Register		Appropriate Signage	
		Other-		Inspection Test Plan			

Comments:

<u>R</u>einforce positive behaviours and **<u>E</u>ncourage** improvements. Agree actions with worker and supervisor.

Recognised safe and positive behaviours observed		Supervisor updated? (name: ________________________________)	

Observed	**Action(s)**[2]	**Responsible**	**Date**	**SIMS**

---

[2] Actions may be preventative &/or reinforcing (e.g. sharing improvements/best practices, communication or recognition)

Appendix 5: Inspection Protocol and Final Production Contamination QA Audit

Issued to :	Recycling Manager	
Copies to :	Operations Manager - Recycling	
	Site Manager	
	Site Supervisor(s)	

BORAL RECYCLING PTY LTD
CONSTRUCTION AND DEMOLITION RECYCLING - RECIEVALS INSPECTION PROTOCOL & FINAL PRODUCT CONTAMINATION QA AUDIT

Site: ……………………………………

Premises Details: ……………………………………

Conferred With: ……………………………………

Previous Audit Date: ……………………………………

Audit Date: ……………………………………

Audited By: ……………………………………

Publication Date: ……………………………………

Forward

The purpose of this audit is to identify areas where a potential for contamination of recycled products could occur through receiving, inspecting, processing and distribution of recycled construction and demolition materials. The audit focuses on the current protocols and procedures either documented or not.

General: This audit pro forma has been designed to be used for internal purposes only either as a site check list or as an internal audit tool

Appendix 5 cont.

Area of Review	Yes/No/NA (records or visual)	Responsibility	Comments
1.0 Asbestos Awareness and Minimum Standards Training			
1.1 Provide evidence that all employees employees undertaking any tasks involved in meeting the requirements of the Minimum Standards have been trained in accordance with the Minimum Standards. 1.2 Provide evidence that permanent employees have been trained in asbestos awareness in the last 12 months.			
1.3 Provide evidence that all temporary employees involved with the tasks covered by the Minimum Standards receive asbestos awareness training as part of the induction process and annual refresher. 1.4 Provide evidence that permanent employees have been trained in removal of non-friable asbestos training in the last 12 months. 1.5 Provide evidence of non-friable asbestos removal SWP or similar and safety equipment.			
1.6 Are visual examples of typical suspected ACM materials displayed in the weighbridge?			
Comments:			
2.0 Demolition and Material Source Sites			
2.1 Who are the designated receivals account managers?			
2.2 Are demolition sites inspected for compliance in relation to material separation and handling?			
2.3 How frequently is this performed?			

Appendix 5 cont.

Area of Review	Yes/No/NA (records or visual)	Responsibility	Comments
2.4 On what occasions are clearance certificates obtained.			
Comments:			
3.0 Recycling Plant – Material Delivery: Weighbridge (Inspection Point 1)			
3.1 Upon arrival material delivery trucks report to Weighbridge/Office?			
3.2 Persons delivering materials are identified and details noted. How?			
3.3 Loads inspected, classified and weighed/estimated.			
3.4 Rejected loads directed off site and noted in 'Rejected Loads Register' and a copy of the docket for the rejected load is provided to the truck driver noting cancellation/rejection			
3.5 Is the 'Rejected Loads Register' available for inspection, what details are contained within?			
3.6 How frequently are loads rejected from the weighbridge/office or tip off? Check Rejected Loads Register			
3.7 A docket is produced electronically for all loads.			
3.8 The docket is given to the driver as an indication of an accepted load at Inspection Point 1.			
Comments:			
4.0 Recycling Plant – Material Delivery: Material Tipping (Inspection Point 2)			
4.1 Loads directed to Inspection Point 2.			
4.2 Driver shows the docket to the spotter prior to tipping as proof of weighbridge/office inspection.			

Appendix 5 cont.

Area of Review	Yes/No/NA (records or visual)	Responsibility	Comments
4.3 All loads spread and the surface area inspected for any suspected ACM.			
4.4 The load is then manually or mechanically turned, and the newly available surface area is visually inspected for any suspected ACM by a person or by a camera.			
4.5 The spotter completes the Inspection Point 2 Register to indicate that the load has passed the second inspection.			
4.6 Provide evidence of the Inspection Point 2 Register for future reference with the inspection verifications.			
Comments:			
5.0 Waste Storage Area (Inspection Point 3)			
5.1 Is each waste type stored in a separate area that is clearly identified as per the Inspection Point Maps?			
5.2 Maps identifying the Inspection Points are placed in the Weighbridge and daily toolbox areas.			
5.3 Each stockpile of waste is clearly separated from stockpiles of other waste if it is being stored outside of an enclosed bay.			
Comments:			
5.0 Suspect Load Handling Procedure			
5.1 Are all relevant employees trained on this procedure?			
5.2 If source of material is unknown and disposal is required are these non-conformances recorded.			

Appendix 5 cont.

Area of Review	Yes/No/NA (records or visual)	Responsibility	Comments
5.3 Are records maintained on all suspected ACM disposed off site?			
Comments:			
6.0 On site Plant operators			
6.1 Operators involved in tasks associated with the Inspection receivals Protocol and minimum standards are vigilant in the identification of suspected ACM.			
Comments:			
7.0 Auditing			
7.1 Internal short form audit by recycling staff on a monthly basis. Provide evidence.			
7.2 Formal audit by Boral Recycling management team with assistance from HSE representative performed annually. Provide evidence.			
7.3 External audit by a consulting occupational hygienist annually on a random occasion. Provide evidence of agreement with consultant and copy of audits.			
Comments:			
9.0 Protocol Document Control			
9.1 Date Issued displayed:			
9.2 Document review date displayed:			
9.3 Contact names up to date:			
Comments:			

Appendix 5 cont.

Area of Review	Yes/No/NA (records or visual)	Responsibility	Comments
10.0 Recycled Product QA Practice			
10.1 Once C&D material is pulverised, crushed, screened and placed into stockpiles for sale, what QA procedure both written and not are undertaken in regards to testing and suspect ACM			
10.2 To what extent is this documented?			
10.3 How are employees trained?			
Comments:			

Appendix 5 cont.

Summary Comments (Brief comments regarding overall standard of site procedures, documentation, and any non-conformances).

	Concern	Cause	Countermeasure

Comments:

Appendix 5 cont.

RECOMMENDATIONS - ACTION PLAN

Region: **Date of Audit:**

Project Details: **Date of Response:** ____________________

The following recommendations for improving environmental risk management are proposed. The responsibility whether or not to implement these recommendations rests with the Recycling Manager receiving this report. It is vital that operations complete a copy of the Recommendations - Action Plan pages, including the response and progress on individual recommendations and forward these sheets to the Environment Manager for verification of suitability of proposed actions.

Ratings: **A** Significant non-compliance with statutory instruments, codes and/or standards, or high environmental risk exposure with major impact potential - for immediate action.

B Environmental improvements or minor non-compliances requiring only limited organisation change and/or expenditure - for prompt action.
C Lesser environmental risk exposure and/or with moderate or minor impact potential - for medium term action.
D Superior standard of environmental performance requiring significant capital expenditure - for appropriate scheduling.

Item No. (Eyear-No. eg. E02-01)	**Element** (refer Audit Item No.)	Recommendation	**Rating A,B,C,D**	**Proposed Action**	**Cost Estimate**	**Person Responsible**	**Estimated Completion Date**	**Actual Completion Date**

Appendix 6: Training Attendance Record

Training Details			
Course Name:	**Boral Recycling Inspection and Receivals Protocol**	**Date of Training:**	
Division / Business / site:	Boral Construction Materials / Recycling -		
Trainer's Name:			

Attendance Record					
To be completed by persons completing the course				***To be completed by Trainer only***	
Trainee's Name	**Trainee's Position**	**Trainee's Signature**	**Employee No.**	**Compet-ency**	**Trainer's Signoff**

Appendix 7: EPA list of waste types

Description of waste
Aggregate, road base or ballast
Aluminium (non-ferrous)
Ashes
Asphalt
Batteries
Bricks or concrete
Biosolids or manures
Ceramics, tiles, pottery
Composts or mulches
Contaminated soil
Dredging spoil
E-waste
Ferrous (iron or steel)
Food or kitchen
Glass
Mattresses
Mixed Waste
Non-ferrous (metals, not iron steel or aluminium)
Oil
Paper or cardboard
Plasterboard
Pharmacy or clinical
Plastic
Potential Acid sulphate Soils
Problem Waste
Residues or rejects
Shredder floc
Soil (not contaminated or VENM)
Textiles, rags
Tyres
Vegetation or garden
Virgin excavated natural materials
Veterinary waste
Wood, trees or timber

Appendix 8: Daily Checklist/ Receivals Spotter Pre-Start

PPE Requirements	Yes	No	Action/NA	Init
Orange Rooback LED Hi-Viz vest - Spotters Only				
Is the LED Hi-Viz vest working?				
Orange light up baton/Is it working-Spotter Only				
Do you require a Helmet lamp or torch?				
Are you carrying your Gloves?				
Have you checked your 1st Aid equipment?				
Communication				
Complete 2way radio check with HME				
Complete 2way radio check with Spotter 2				
Inspection Recievals Protocol				
P2 dust masks / Tyvek suits available?				
Are there Asbestos bags and ties available?				
Environmental				
Have checked Water pressure?				
Have checked Fire fighting equipment?				
Traffic Management				
Have you completed Take5?				
Is the Receivals ready for traffic movement				
Stockpile Management				
Have you daily toolbox on stockpiling requirement?				
Have you undertaken a visual stockpile inspection and completed a Take 5? - As per min standards, is the stockpile area compact, hard ect (Check standards) -				
Training				
Are the Spotters trained in WRSWMS-R-001 V4 Operation in receivals?				
Are the Spotters trained in WRSWMS-R-003 Tyre and Draw bar inspection?				
Are the Spotters trained in WRSWMS-G-007 Two way radio usage?				
Are the Spotters trained in WRSWMS-R-009 Rejected load protocol V2?				

Appendix 8 cont.

Collection of Dockets				
Sign Off				
Sign Spotter 1	Sign Spotter 2 -	Date		
Comments				

Appendix 9: Map indicating Inspection Points 1 and 2 and Waste Storage Area (Inspection Point 3)

Widemere

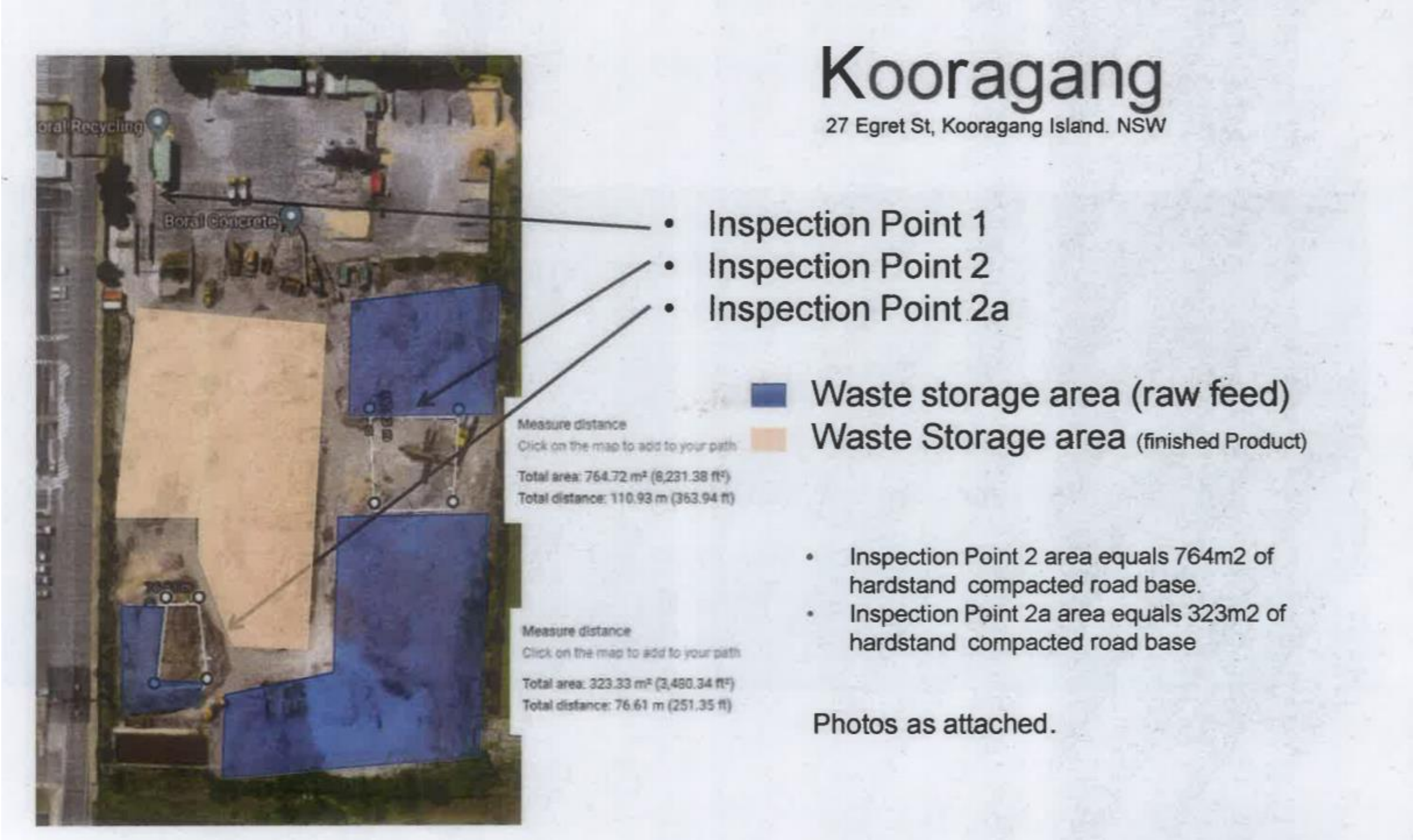
Boral Recycling Inspection Points

Boral Widemere Recycling
Widemere Rd,
Wetherill Park NSW 2164

🟪 Inspection Point 1
🟧 Inspection Point 2
🟥 Inspection Point 3
🟦 Waste Storage Area
🟩 Waste Storage Area

Inspection Point 2 area equals 1,948m2 of hardstand compacted roadbase.

Kooragang



Kooragang

27 Egret St, Kooragang Island. NSW

- Inspection Point 1
- Inspection Point 2
- Inspection Point 2a

🟦 Waste storage area (raw feed)
🟧 Waste Storage area (finished Product)

Measure distance
Click on the map to add to your path
Total area: 764.72 m² (8,231.38 ft²)
Total distance: 110.93 m (363.94 ft)

Measure distance
Click on the map to add to your path
Total area: 323.33 m² (3,480.34 ft²)
Total distance: 76.61 m (251.35 ft)

- Inspection Point 2 area equals 764m2 of hardstand compacted road base.
- Inspection Point 2a area equals 323m2 of hardstand compacted road base

Photos as attached.

Appendix B

Take 5 form

BORAL®

Take Five for Safety

Task Details

Site/Company: Date:

Name:

Describe task:

Pre-task Checks

☑ if Yes, ☒ if No OR ⊟ if NA

Am I fit to do the task? ☐

Do I clearly understand the task? ☐

Am I authorised/competent to do the task? ☐

Do I have the correct PPE and tools for the task? ☐

Have I done all pre-start checks on equipment? ☐

Have I identified, isolated, locked and tagged all energy sources? ☐

Have I done the required High Risk or Authority to Work Permits for the task? ☐

Have I told others that may be affected by my work? ☐

If ☒ see your supervisor

Hazard Identification

Have I used the checklist on the back of this form to identify hazards? ☐

Have I identified, risk ranked and managed the hazards in my work area? ☐

What is the highest residual risk identified? (circle) **H** **M** **L**

If: “**H**” STOP WORK, see your Supervisor
“**M**” prepare SWMS.
“**L**” begin the task.

Signature:

Do not start work if the risk is rated as “**H**’.
Put controls in place to reduce the risk to at least “**M**” and develop SWMS.

No.	**Hazard** (circle)				
1	**Atmosphere**	Flammable	Contaminated	Dusty	
2	**Chemical**	Reaction	Absorb/Ingest/ Inhale	Spill	Burn
3	**Electrical**	High Voltage	Overhead	Underground	Leads
4	**Environment**	Wind	Rain	Hail/ Snow	Fog
5	**General**	Bites/Stings	Sharp edges	Vibration	Body of water
6	**Gravity**	Slip or Trip	Fall from height	Falling objects	
7	**Manual Handling**	Twisting/Grip	Lifting/ Lowering	Pushing/ Pulling	Weight/Shape
8	**Light**	Too dark	Too bright	Poor visibility	
9	**Mechanics**	Struck by	Strike against	Caught between	Caught in
10	**Noise**	Continuous	Intermittent	Impact	Environmental
11	**Pressure**	Air	Fluid	Gas	
12	**Radiation**	UV	Radioactive source	Laser	Infra-Red
13	**Thermal**	Hot environment	Cold environment	Cold surfaces	Hot surfaces
14	**Traffic**	Pedestrians	Vehicles	Mobile plant	Speeding
15	**Other**				

Hazard No.	Risk Rating	Controls	Residual Risk

BCC 11876 APR13

What is the highest residual (left over) risk after controls are in place?

H M L

No work can start until the risk is reduced to “**M**” or “**L**”. If the risk is “**M**” develop a SWMS.

Appendix C

Cover letter regarding EPA consultation and EPA's response

Build something great™

BORAL®

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27 October 2017

Melissa Ward
Senior Manager Waste Compliance
Waste and Resource Recovery
Environment Protection Authority
PO Box A290
SYDNEY SOUTH NSW 1231

Dear Melissa,

Condition of Consent SSD 6525: Consultation with EPA during development of management plans
Boral Recycling Pty Ltd – 38 Widemere Road, Wetherill Park (EPL 11815)

In accordance with the requirements of Condition B12 of the Development Consent (SSD 6525) for Widemere Recycling facility, Boral is required to consult with relevant public authorities prior to submitting specific documentation to the Secretary for approval.

Boral has an obligation to consult with the EPA during the preparation of the following management plans to be incorporated into the Operational Environmental Management Plan (OEMP) for the Development:

Waste Management
C1. Waste Monitoring Program

Noise Management
C10. Noise Management Plan

Dust Management
C17. Dust Management Plan

Copies of the draft management plans are attached for review and comment by the EPA. We are working towards a milestone date for the OEMP and associated management plans to the Department of Planning & Environment (DPE) being 1st December 2017. We would appreciate receiving feedback from the EPA within this period for consideration when finalising the plans.

If you require any further information regarding our comments please feel free to contact me on 0408 400 661.

Regards

Jason Sweeney
State Manger Recycling – NSW/ACT
Boral Recycling
E: jason.sweeney@boral.com.au

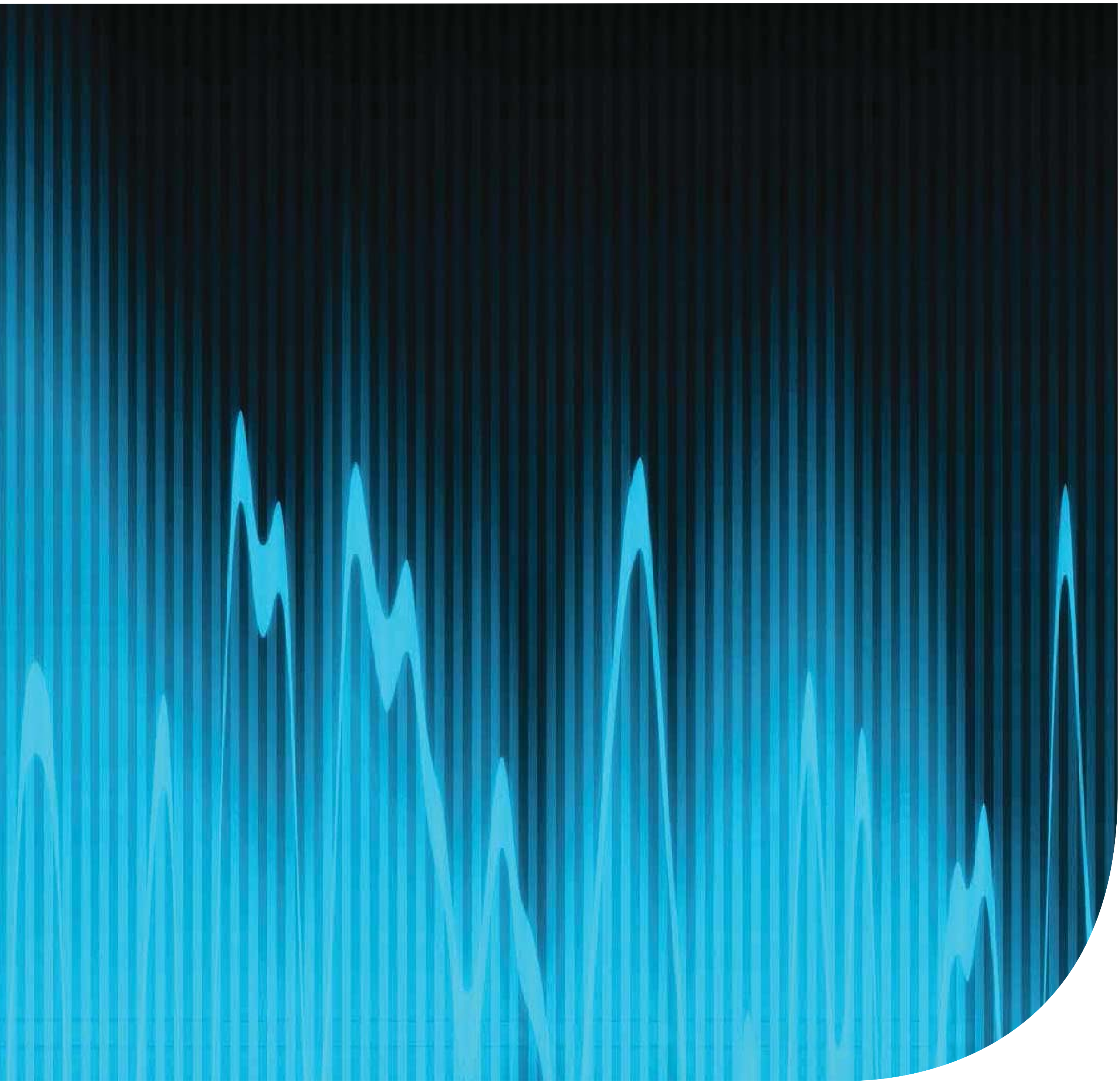
Appendix B

Noise management plan

Widemere Recycling Facility

Noise Management Plan

Prepared for Boral Recycling Pty Ltd | 26 May 2021



Widemere Recycling Facility

Noise Management Plan

Prepared for Boral Recycling Pty Ltd | 26 May 2021

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Widemere Recycling Facility

Final

Report J17038RP1 | Prepared for Boral Recycling Pty Ltd | 22 February 2018

Prepared by	**Katie Teyhan**	Approved by	**Najah Ishac**
Position	Acoustics Manager - Newcastle	Position	Director
Signature		Signature	
Date	26 May 2021	Date	26 May 2021

Document Control

Version	Date	Prepared by	Reviewed by
1	30 January 2018	Katie Teyhan	Najah Ishac
2	22 February 2018	Katie Teyhan	Najah Ishac
3	26 May 2021	Shoanne Labowitch	Lawrence Wallis/Brett McLennan

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Appendices

Tables

Figures

1 Introduction

This noise management plan (NMP) has been prepared to satisfy Condition C10 of the Development Consent SSD 6525 for the Boral Recycling Pty Ltd (Boral) recycling facility at Widemere Road, Wetherill Park. The Operational Environmental Management Plan of which this NMP is a sub-plan, covers the entire Development and applies to a processing capacity at the facility of up to 1,000,000 tonnes per annum (tpa).

The NMP has been prepared by Katie Teyhan, an associate consultant with EMM and Member of the Australian Acoustical Society (Curriculum vitae attached as Appendix A). This NMP has been prepared in accordance with the NSW *Noise Policy for Industry* (2017).

A number of technical terms are required for the discussion of noise. These are described in Appendix B.

The NMP requirements, as per Conditions C10 and D3 of the Development Consent SSD 6525, are provided in Table 1.1 together with the relevant section of the NMP where these items have been addressed.

Table 1.1 NMP requirements - Condition C10, Development Consent SSD 6525

Requirement	Relevant section of NMP
C10. As part of the OEMP for the Development, required under Condition D2 of this consent, the Applicant shall prepare a Noise Management Plan. The Plan must:	
(a) be prepared by a suitably qualified and experienced person(s) in consultation with the EPA;	Section 1 and Appendix A
(b) be approved by the Secretary prior to the commencement of the expanded operations;	
(c) include up to date site plans;	Figure 3.1
(d) identify all major sources of noise that may be emitted as a result of the operation of the Development;	Section 3.4
(e) specify the noise criteria as it applies to the particular activity;	Section 2
(f) include procedures for the monitoring of noise emissions from development, in accordance with any requirements of the EPL;	Section 4
(g) include protocols for the minimisation of noise emissions including deployment of the noise mitigation measures outlined in Condition C9;	Section 3.1 and Section 3.5
(h) describe the procedures to be undertaken if any non-compliance is detected; and	Section 6
(i) detail the mechanisms to consider and address cumulative noise impacts in the context of development in the Greystanes Estate / Widemere Area.	Section 4.2
D3. The Applicant shall ensure that the environmental management plans required under this consent are prepared in accordance with any relevant guidelines and include:	
(a) detailed baseline data;	Section 2 and Appendix C
(b) a description of:	
(i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);	Section 2
(ii) any relevant limits or performance measures;	Section 2
(iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the Development or any management measures.	Section 2
(iv) the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	Sections 3.4 and 6

Table 1.1 NMP requirements - Condition C10, Development Consent SSD 6525

Requirement	Relevant section of NMP
(c) a program to monitor and report on the:	
(i) impacts and environmental performance of the Development;	Section 4
(ii) effectiveness of any management measures;	Section 4
(iii) a contingency plan to manage any unpredicted impacts and their consequences;	Sections 3.4 and 6
(iv) a program to investigate and implement ways to improve the environmental performance of the Development over time;	Section 7
(d) a protocol for managing and reporting any:	
(i) incidents;	Section 4
(ii) complaints;	Sections 4 and 5
(iii) non-compliances with statutory requirements; and	Section 6
(iv) exceedances of the impact assessment criteria and/or performance criteria; and	Section 6
(v) a protocol for periodic review of the plan.	Section 7

2 Noise limits

Operational noise limits were established in accordance with the Industrial Noise Policy (INP) (EPA, 2000) and provided in the noise impact assessment (NIA) report prepared by EMM (refer *Widemere Recycling Facility Noise impact assessment* dated 27 April 2015) to accompany the environmental impact statement for the project. These limits were based on ambient noise data obtained through long-term unattended and operator-attended noise surveys. Relevant ambient noise data was provided in Chapter 3 of the NIA and has been reproduced here in Appendix C.

Operational noise limits provided in Condition C6 of Development Consent SSD 6525 are based on those provided in the NIA as well as operational noise predictions and are consistent with those provided in Condition L5.1 of EPL 11815. The relevant noise limits are provided in Table 2.1. It is noted that there are no cumulative noise criteria specified in either the Development Consent SSD 6525 or EPL 11815.

Table 2.1 Operational noise limits, dB

Location	Day (7am – 6pm)	Evening (6pm – 10pm)	Night (10pm – 12am)		Morning shoulder (6am – 7am)
	$L_{Aeq,15\ minute}$	$L_{Aeq,15\ minute}$	$L_{Aeq,15\ minute}$	$L_{Fmax(15\ minute)}$	$L_{Aeq,15\ minute}$
71 Munro St, Greystanes	39	38	35	50	39
146 Daruga Ave, Nelsons Ridge	35	35	35	50	35
Greystanes Estate – Future southern extent[1]	39	37	35	50	39

Notes: *1.Identified as Location R10 in Widemere Recycling Facility – Noise Impact Assessment (NIA) prepared by EMGA Mitchell McLennan (Ref J13127RP1 dated 27 April 2015).*

2. Noise generated by the Development is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the Industrial Noise Policy.

Condition L5.3 of EPL 11815 states that the noise limits apply under all meteorological conditions except for the following:

a) Wind speeds greater than 3 metres/second at 10 metres above ground level;

b) Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or

c) Stability category G temperature inversion conditions.

Condition L5.4 of EPL 11815 provides that data recorded by a meteorological station installed on site must be used to determine meteorological conditions and that temperature inversion conditions are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy (EPA, 2000).

Should the meteorological station be non-operational due to outage or equipment failure weather station data shall be accessed from the closest appropriate Bureau of Meteorology monitoring station (Prospect Reservoir or Horsely Park Equestrian Centre).

3 Site operations and noise management

3.1 Site context

The facility is located at Lot 4001 Widemere Road, Wetherill Park within the Fairfield local government area (LGA). The closest residential receptors are located approximately 1 km to the east of the facility in Greystanes and 1.5 km north-east of the facility in Pemulwuy, with no direct line of sight to the facility.

A comprehensive Noise Assessment (Appendix D of the EIS) was prepared as part of the development application and concluded that noise emissions from worst case scenario site activities were well below the project specific noise levels (PSNLs) at all assessment locations. In addition, the Noise Assessment also concluded that:

- potential sleep disturbance impacts satisfied the relevant criteria at all assessment locations;
- the facility's cumulative impacts at the closest residential receptors were negligible (up to 1 dB during the daytime and no increase for night time periods);
- road traffic noise associated with the recycling facility's operations was calculated to comply with the relevant NSW Road Noise Policy criteria; and
- there is no history of noise complaints received at the facility or by the EPA.

3.2 Site operations

Approved operations at the facility include the receipt of permitted waste which is sorted, processed and blended on site to produce a range of recycled aggregate and road base products. The facility currently has approval to process up to 1,000,000 tonnes per annum of material.

The facility occupies an area of approximately 9.8 hectares (ha), and comprises the following general areas (see Figure 3.1):

- receival area which includes a weighbridge, spot checking platform, and administration buildings;
- incoming materials stockpile area where incoming vehicles unload waste material;
- processing plant;
- processed materials stockpiles including imported quarry product; and
- water management area (including retention basins).

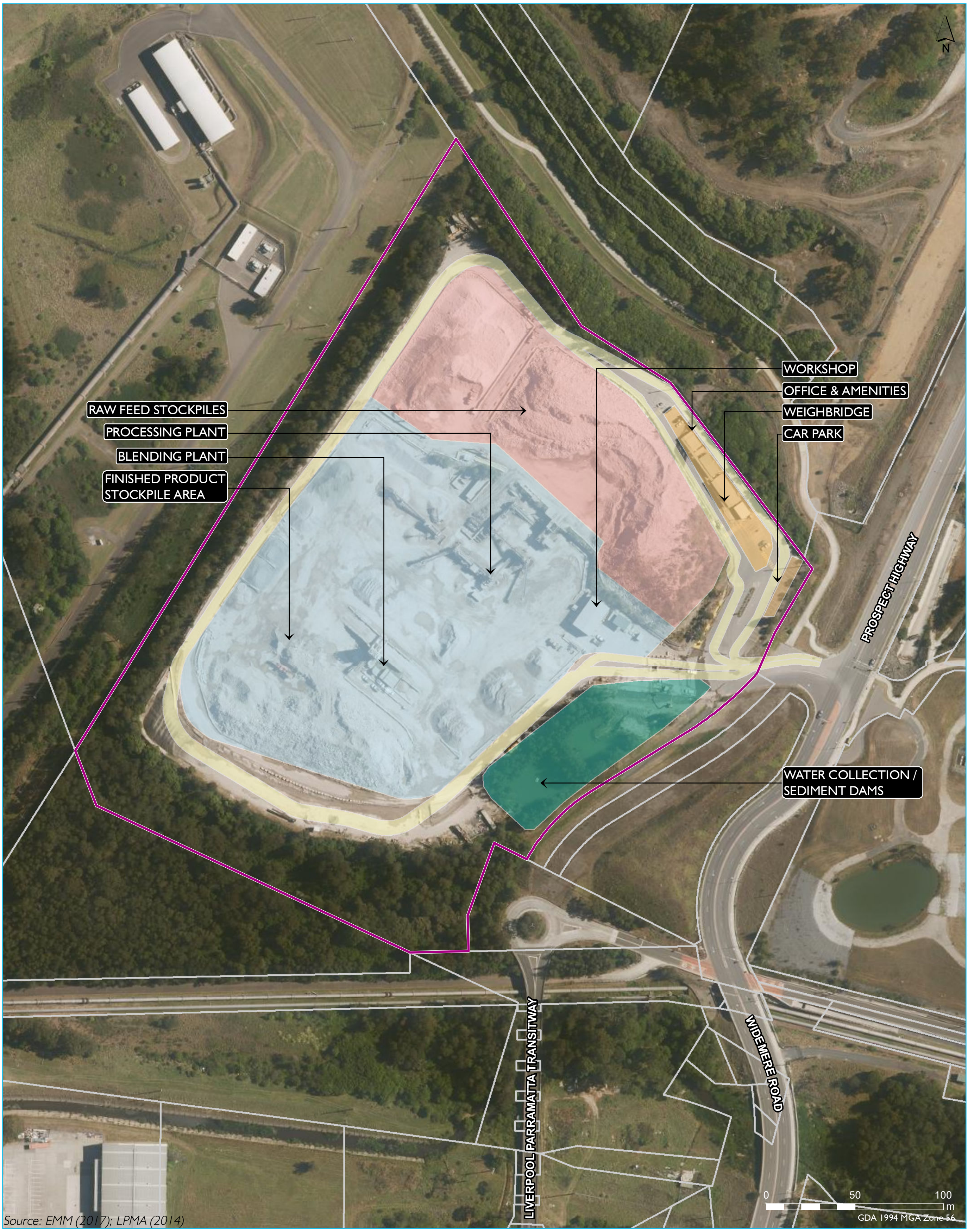
3.3 Operational hours

The approved operating hours are outlined in Condition C3 of Development Consent SSD 6525 and are provided in Table 3.1.

Table 3.1 Approved operating hours

Activity	Day	Approved hours
Processing, receival and dispatch activities	Monday to Saturday	6 am to midnight
	Sunday	6 am to 6 pm (one Sunday per month)
	Public holidays	Nil
Ancillary operations[1]	Monday to Saturday	6 am to midnight
	Sunday	6 am to 6 pm
	Public holidays	Nil

Notes: 1. Ancillary operations means any servicing and/or maintenance of the equipment/machinery associated with the development, loading and unloading of material onto/from vehicles and stockpiles and the selling of recycled product.



Source: EMM (2017); LPMA (2014)

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KEY

🟪 Site boundary	🟩 Water collection / sediment dams
⬜ Cadastre	🟧 Receivals area
🟨 Perimeter haul road	🟫 Car park
🟦 Processing area and product stockpile	
🟥 Incoming materials stockpile area	

Site layout

Boral Widemere OEMP

Noise management plan

Figure 3.1

3.4 Plant and equipment

Acoustically significant plant and equipment utilised at the site, as per the Environmental Impact Statement (EIS) for the project prepared by EMM dated 29 May 2015, and their indicative sound power levels are provided in Table 3.2.

Table 3.2 Operational plant and equipment and indicative sound power levels

Equipment	Indicative sound power level (dB)
980H loader	108
972 loader	110
Telehandler	106
Powerscreen	111
Excavator 227	105
Excavator 226	105
Freightliner	115
Jaw crusher	116
Impact crusher	112
Primary screen	115
Secondary screen	111
Screen 3	107
Blending plant	105
Trucks	95

3.5 Site noise management

Condition C9 of Development Consent SSD 6525 requires the following in relation to noise mitigation at the site:

- Implementation of best management practice, including all reasonable and feasible noise management and mitigation measures to prevent and minimise operational, low frequency and traffic noise generated by the development;
- Minimise the noise impacts of the development during adverse meteorological conditions;
- Maintain the effectiveness of any noise suppression equipment on plant at all times and ensure defective plant is not used operationally until fully repaired; and
- Regularly assess any noise monitoring data and relocate, modify and/or stop operations to ensure compliance with the relevant conditions of Development Consent SSD 6525.

It is not considered necessary to include specific triggers for noise mitigation measures, given the history of compliance and no complaints, the large buffer between the site and the closest residential receptors, and the favourable modelling results from the noise assessment (see Section 3.1).

Specific noise management measures utilised at the site include the following:

- implementation of a noise management program to increase employee awareness of noise issues;

- regular servicing and maintenance of fixed and mobile plant to ensure the equipment is operating to specification; and

- incorporation of advanced and affordable technology to minimise noise from equipment, plant and machinery used on site.

Other general noise mitigation measures that would be considered at the site, if required, include the following:

- Restricting movement of equipment on exposed areas;

- Scheduling the loading of material which are potentially noisier to occur at the least sensitive time of the day or night;

- Siting noisy equipment behind structures that act as barriers, or at the greatest distance from the noise-sensitive area;

- Orienting equipment so that noise emissions are directed away from any sensitive areas;

- Employing ‘quiet’ practices when operating equipment e.g. positioning idling trucks in appropriate areas;

- Using a non-acoustic method or “smart” alarms (which limit the acoustic range of the warning) to warn of vehicles reversing;

- Efficient muffler design on relevant equipment;

- Barriers (in the form of free-standing walls, earth-mounds or bunds or placing acoustically significant equipment in trenches or cuttings).

4 Noise monitoring

4.1 Monitoring locations

Condition L5.5 of EPL 11815 provides details regarding appropriate noise monitoring locations in determining compliance with the relevant noise limits. This condition is reproduced as follows:

> L5.5 To determine compliance:
>
> a) with the Leq(15 minute) noise limits in condition L5.1, the noise measurement equipment must be located
>
> - approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
>
> - within 30 metres of a dwelling façade, but not closer than 3m, where any dwelling on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
>
> - within approximately 50 metres of the boundary of a National Park or a Nature Reserve.
>
> b) with the LA1(1 minute) noise limits in condition L5.1, the noise measurement equipment must be located within 1 metre of a dwelling façade.
>
> c) with the noise limits in condition L5.1, the noise measurement equipment must be located:
>
> - at the most affected point at a location where there is no dwelling at the location; or
>
> - at the most affected point within an area at a location prescribed by conditions L5.5(a) or L5.5(b).

Noise monitoring locations consistent with the requirements of EPL 11815 are shown in Figure 4.1.

Source: EMM (2017); LPMA (2014)

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KEY

▭ Site boundary	🟩 NPWS reserve
● Noise monitoring location (EPA ID)	
▭ Cadastre	
— Local road	
— Watercourse	

Noise monitoring locations

Boral Widemere OEMP

Noise management plan

Figure 4.1

EMM

4.2 Monitoring methodology

Operator-attended noise monitoring shall occur for a minimum of 15 minutes duration at each monitoring location during each period (day, evening, night and morning shoulder). Attended noise monitoring is scheduled with consideration given to the occurrence of regular operations and forecast appropriate meteorological conditions.

Noise monitoring shall be conducted as guided by the following standards and guidelines:

- AS 1055.1-1997 Acoustics - Description and measurement of environmental noise - General procedures;
- AS IEC 61672.1-2004 Electroacoustics - Sound level meters – Specifications; and
- NSW Industrial Noise Policy (EPA 2000).

All acoustic instrumentation used for monitoring will have current National Association of Testing Authorities (NATA) or manufacturer calibration certificates.

Condition L5.7 of EPL 11815 states that *"for the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment."*

For each 15-minute attended noise monitoring period, the following information will be recorded:

- name of monitoring personnel;
- monitoring location (including coordinates and a map);
- dates and times that monitoring began and ended at each location;
- height of the microphone above the ground and, if relevant, distances to building facades or property boundaries;
- quantitative meteorological data such as temperature, wind speed (including the measurement height above ground), wind direction and humidity;
- qualitative meteorological information such as cloud cover, fog, rainfall and presence of temperature inversions;
- instrument type and calibration details before and after the monitoring period;
- the $L_{Aeq,15\ minute}$ noise level (total and site contributions);
- statistical noise level descriptors over the 15-minute interval: L_{Amin}, L_{A90}, L_{A10}, L_{A1} and L_{Amax};
- $L_{AF,max}$ noise levels (to allow comparison with the relevant sleep disturbance criteria);
- notes identifying the noise sources that contribute to the maximum noise levels and the overall noise environment or for periods of time when a specific noise source is audible;
- an estimate of the noise contribution from site operations;

- an estimate from other identifiable noise sources, including other industrial noise from Greystanes Estate or the Widemere Area;
- measurement of C-weighted and A-weighted level to assess low frequency noise in accordance with Section 4 of the INP (a 5 dB correction is applicable if the difference between is 15 dB or more);
- recommendations or comments where considered appropriate.

4.3 Cumulative noise impacts

Although cumulative noise criteria are not specified for the site, the relative contribution of the site to total industrial noise levels will be determined and recorded during attended noise monitoring surveys. These levels will be compared to recommended acceptable total industrial noise levels, as per the INP, and recommendations provided where relevant. Where the site's contribution is measured to be above the relevant noise criteria provided in the Development Consent or EPL 11815 the corrective action procedure summarised in Section 6 would be followed.

4.4 Monitoring frequency and reporting

The frequency of noise monitoring is not specified in either the EPL 11815 or the Development Consent. Noise monitoring shall occur upon the commencement of a substantial changes in operations (i.e. once the expanded operations definition in SSD 6525 is triggered) as well as in response to complaints regarding noise. All noise data shall be reported in the Annual Return as required in SSD 6525.

5 Community information and complaints handling

In order to effectively manage any requests for information or respond to any public concerns in relation to the operation, the following systems shall be maintained:

- An Environmental Hotline (Phone No. 1300 853 999) to allow contact with the Company in relation to any environmental matter including those concerned with noise issues.
- Boral Recycling will supply Fairfield City Council with the names and appropriate contact number for the Widemere site manager and one other senior staff member.
- Boral Recycling will use the current complaints handling system to monitor environmental noise complaints. The Company will endeavour to respond to any complaint within one working day of its receipt. All information relating to noise complaints will be kept in a register. The register will include, but not be restricted to, the following information:
    - Date and time of the complaint;
    - Complainant details (ie full name and contact details if approved for use);
    - Nature and source of complaint;
    - Action taken;
    - Follow-up with complainant.

6 Corrective action

The following measures shall be implemented as soon as practicable after receipt of a noise complaint or determination of an exceedance of the relevant noise limits:

- Identify the noise source that is the cause of the complaint and/or exceedance. This would be done by consultation with the complainant or observations made by the person undertaking noise monitoring.
- Consider the noise mitigation measures outlined in Section 3.5 with particular attention to the following:
    - Scheduling of noisy activities;
    - Siting of noisy equipment used on site;
    - Use of non-acoustic reversing alarms; and
    - Use of quieter plant and equipment.
- Following the adoption of additional mitigation measures, noise monitoring would be undertaken in accordance with the methodology provided in Section 4.2 at the relevant location to determine the success of the mitigation measure. Results of the noise monitoring shall be reported (as per Section 4.3) in the Annual Return.

7 Improvement and review

Boral will maintain awareness of new technologies for noise mitigation and, in addition to those outlined in Section 3.4, Boral will implement noise mitigation measures in line with industry best practice where reasonable and feasible to do so.

Boral will review and, where necessary, revise the NMP within three months of the submission of an audit, Annual Review, an incident report, or any modification to the conditions of the Project Approval. The NMP will further be subject to a three year periodic review. The review of the NMP will reflect changes in environmental requirements, technology and operational procedures.

Appendix A

CV - Katie Teyhan

Curriculum vitae

Katie Teyhan

Manager Acoustics Newcastle

Katie is passionate about continual professional development with regard to both technical and leadership capability of herself and her team. This commitment has been demonstrated by her appointment as a lecturer at the University of Newcastle in the faculty of Engineering and the Built Environment as well as acoustics team leader and office manager. Katie also initiated and enabled EMM’s successful application for membership to the Association of Australasian Acoustical Consultants (AAAC).

As Office Manager Katie was leader of a multi-disciplinary team of environmental consultants. Her role as Design Control Manager involved the development and coordination of technical resources across numerous technical disciplines including acoustics, environmental planning and approvals, air quality, land and water, ecology, waste management and strategy, valuations, hazardous materials and occupational hygiene.

Katie has extensive experience in the technical field of environmental acoustics including measurement, prediction and assessment of noise and vibration associated with mining, industry, roads and railway transportation systems as well as in the acoustical planning of land uses near such developments. Katie also has considerable experience in conducting peer reviews, audits and preparation of expert evidence in relation to noise and vibration assessment, methodology and compliance.

Katie is experienced in the development and execution of external acoustics and vibration training services as well as providing internal training and technical mentoring to staff.

Qualifications and memberships

- Bachelor of Engineering (Mechanical) (Hons 1st Class)
- Bachelor of Mathematics
- Advanced Diploma of Management
- Member of Engineers Australia (MIEAust)
- Member Australian Acoustical Society (MAAS)

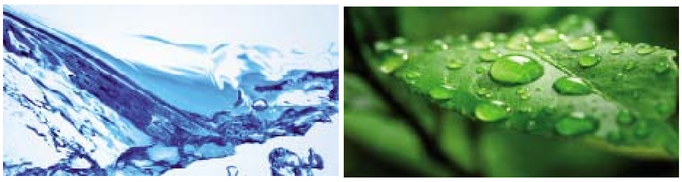
Career

- EMM Consulting, 2015–present
- Associate Consultant – Acoustics and vibration SLR, 2002–2015

Representative experience

Mining and Quarries

- Mangoola noise assessment and monitoring, ongoing acoustical advice, preparation of training material and development of noise prediction tool, Hunter Valley (Glencore)
- Ravensworth and Narama blasting noise and vibration impact assessments, Hunter Valley (Glencore)
- Mt Owen Continued Operations project noise impact assessment, Hunter Valley (Glencore)
- Centennial Coal – noise and vibration impact assessments and compliance monitoring activities, Northern and Western regions, NSW
- Werris Creek Coal Mine independent noise audit, Werris Creek NSW (Whitehaven Coal)



Agricultural

- Small stock abattoir noise impact assessment to accompany development application, Bourke NSW

Commercial/Industrial

- Kooragang and Carrington Terminals ongoing noise assessment and management, Newcastle NSW (Port Waratah Coal Services)

- Greta Train Support Facility, operational noise and vibration review, Hunter Valley (Pacific National)

- Benedict Recycling Facility noise impact assessment to support the development application and ongoing noise compliance monitoring in accordance with the environment protection licence, Mayfield NSW

Transport

- Nabiac Pacific Highway upgrade, Possums Brush to Bundacree Creek, Nabiac (Baulderstone Hornibrook JV)

- Rail noise impact assessment prepared for the Berrima Rail Project which is proposed for development alongside the Hume Coal Project, NSW

Land Use Planning

- Cawdor Planning Proposal – acoustical constraints analysis and road traffic noise impact assessment to accompany the rezoning application

- Sovereign Hills Project monitoring, modelling and assessment of road traffic noise impacts, Sovereign Hills west of Port Macquarie, NSW (Sovereign Hills Projects Pty Ltd)

- Sancrox Employment Precinct acoustical planning, Port Macquarie NSW (King & Campbell Pty Ltd)

Training Services

Katie has prepared and delivered various acoustics training packages including the following:

- Presentation of noise training material to Queensland Urban Utilities to provide environmental officers with knowledge to effectively assess and manage noise emissions from their assets

- Preparation of technical training documentation and presentation to Tasmanian EPA representatives

- Presentation to Boral environmental representatives and site managers with regard to assessment and management of environmental and occupational noise

- Training for AGL environmental and approvals personnel regarding assessment and management of environmental noise in relation to coal seam gas wells

Appendix B

Acoustic terminology

Several technical terms are discussed in this report. These are explained in Table B.1.

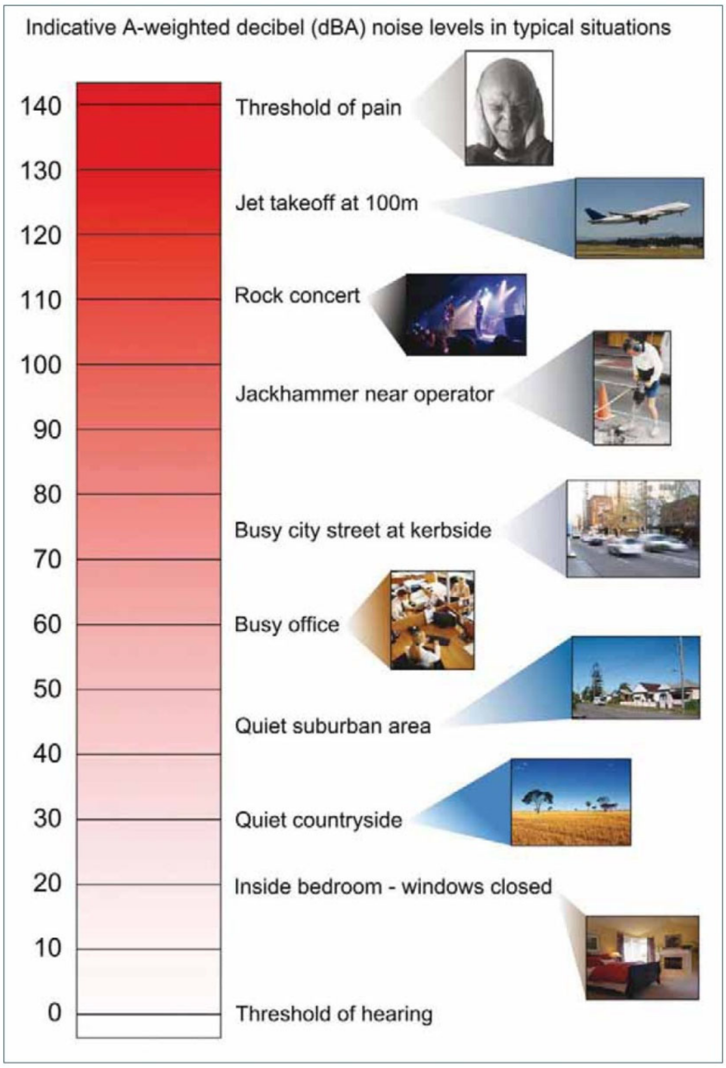
Table B.1 Glossary of acoustic terms

Term	Description
dB	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the ‘A-weighted’ scale. This attempts to closely approximate the frequency response of the human ear.
L_{A1}	The 'A-weighted' noise level which is exceeded 1% of the time.
$L_{A1(1\text{-}min)}$	The 'A-weighted' noise level exceeded for 1% of the specified time period of 1 minute.
L_{A10}	The 'A-weighted' noise level which is exceeded 10% of the time. It is approximately equivalent to the average of maximum noise level.
L_{A90}	Commonly referred to as the background noise level. The 'A-weighted' noise level exceeded 90% of the time.
L_{Aeq}	The energy average noise from a source. This is the equivalent continuous 'A-weighted' sound pressure level over a given period. The $L_{Aeq(15\text{-}min)}$ descriptor refers to an L_{Aeq} noise level measured over a 15 minute period.
L_{Amin}	The minimum 'A-weighted' noise level received during a measuring interval.
L_{Amax}	The maximum root mean squared 'A-weighted' sound pressure level (or maximum noise level) received during a measuring interval.
L_{Ceq}	This is the equivalent continuous 'C-weighted' sound pressure level over a given period. The $L_{Ceq(15\text{-}min)}$ descriptor refers to an L_{Ceq} noise level measured over a 15 minute period. C-weighting can be used to measure low frequency noise.
Temperature Inversion	A meteorological condition where the atmospheric temperature increases with altitude.

It is useful to have an appreciation of decibels (dB), the unit of noise measurement. Table B.2 gives an indication as to what an average person perceives about changes in noise levels. Examples of common noise levels are provided in Figure B.1.

Table B.2 Perceived change in noise

Change in sound level (dB)	Perceived change in noise
3	just perceptible
5	noticeable difference
10	twice (or half) as loud
15	large change
20	four times (or quarter) as loud



Source: Road Noise Policy (Department of Environment, Climate Change and Water 2011)

Figure B.1 Common noise levels

Appendix C

Ambient noise data (Baseline data)

Table B.1 Summary data Logger 1 - Munro St Greystanes

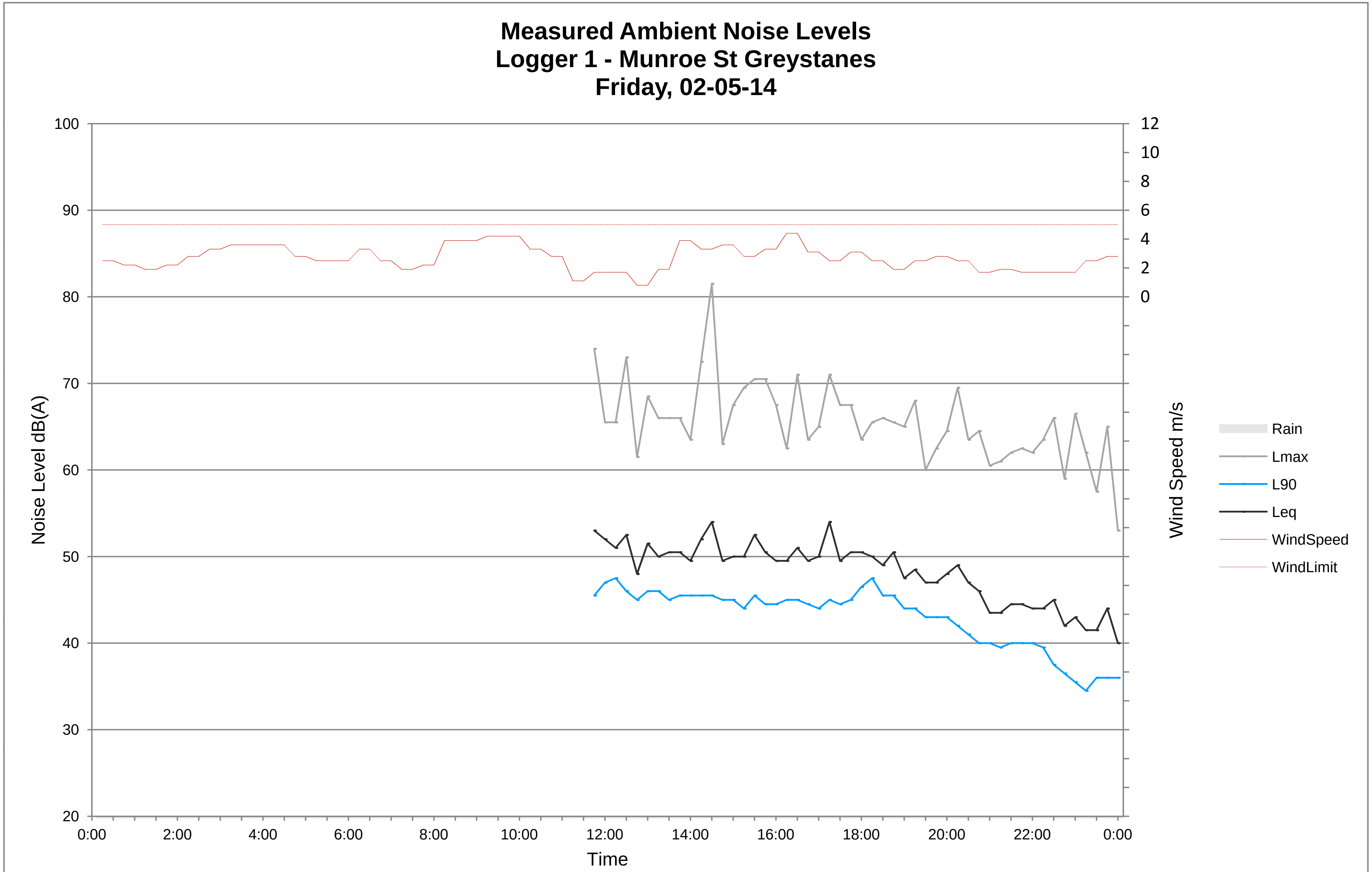
Date	ABL Day	ABL Evening	ABL Night	Leq 11hr Day	Leq 4hr Evening	Leq 9hr Night
Friday, 02-05-14	0	40	34	0	47.4	43.2
Saturday, 03-05-14	43	39	36.5	51.6	47.1	43.3
Sunday, 04-05-14	0	40	39	0	47.2	47.4
Monday, 05-05-14	41	43	39	50.7	48.9	49.2
Tuesday, 06-05-14	43	43	41.5	55.6	48.3	47.7
Wednesday, 07-05-14	44	44.5	41	51.4	52.2	47.1
Thursday, 08-05-14	44.5	43	38	51.5	48.5	47.1
Friday, 09-05-14	40.5	40	37.5	51.2	48.9	44.1
Saturday, 10-05-14	0	0	0	0	0	0
Summary Values						
RBL	**43**	**42**	**39**			
Leq				**52**	**49**	**47**

Notes: '0' indicates periods with too few valid samples due to weather or logger operation.

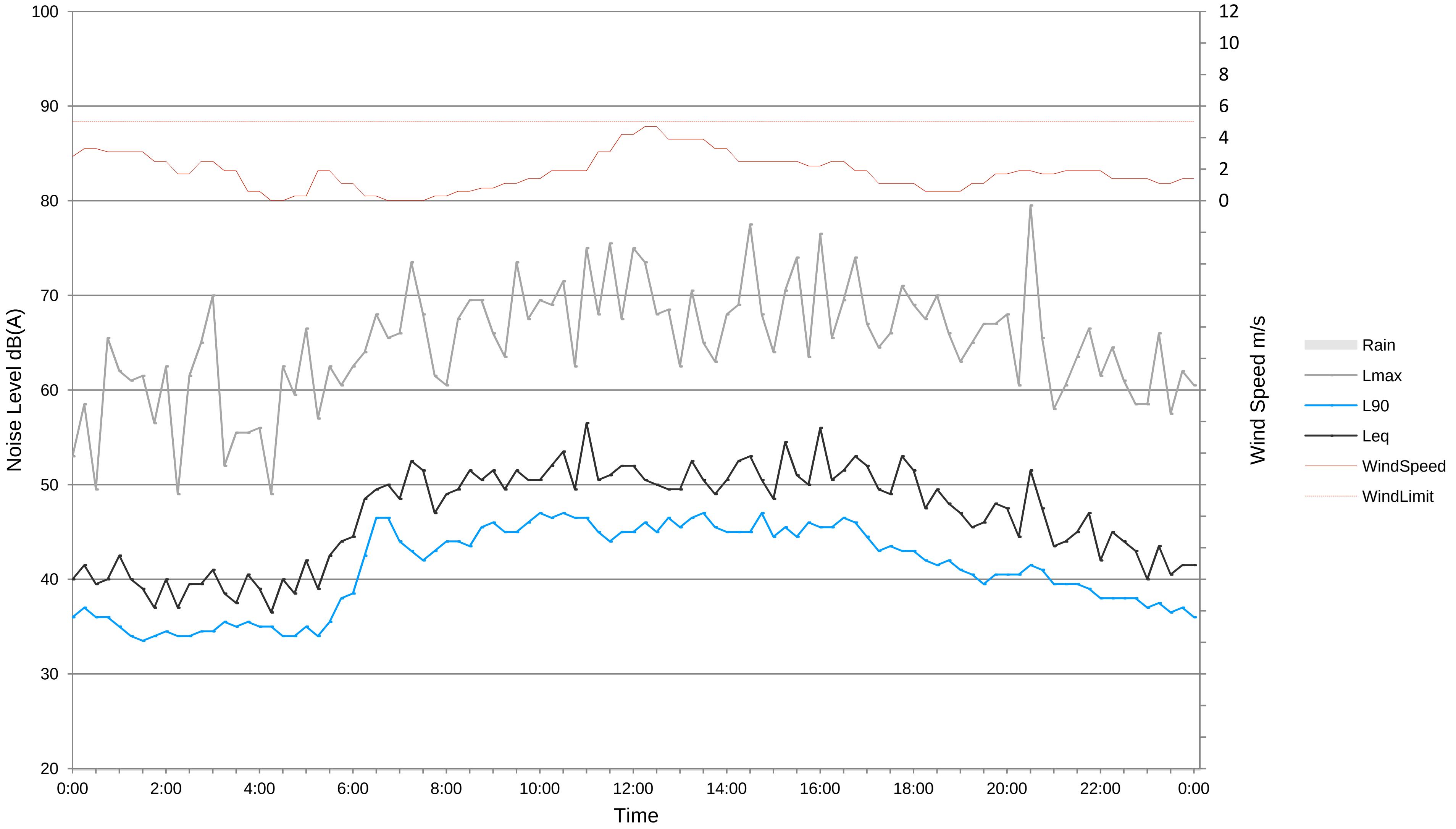
Table B.2 Summary values Logger 2 - Pemulwuy

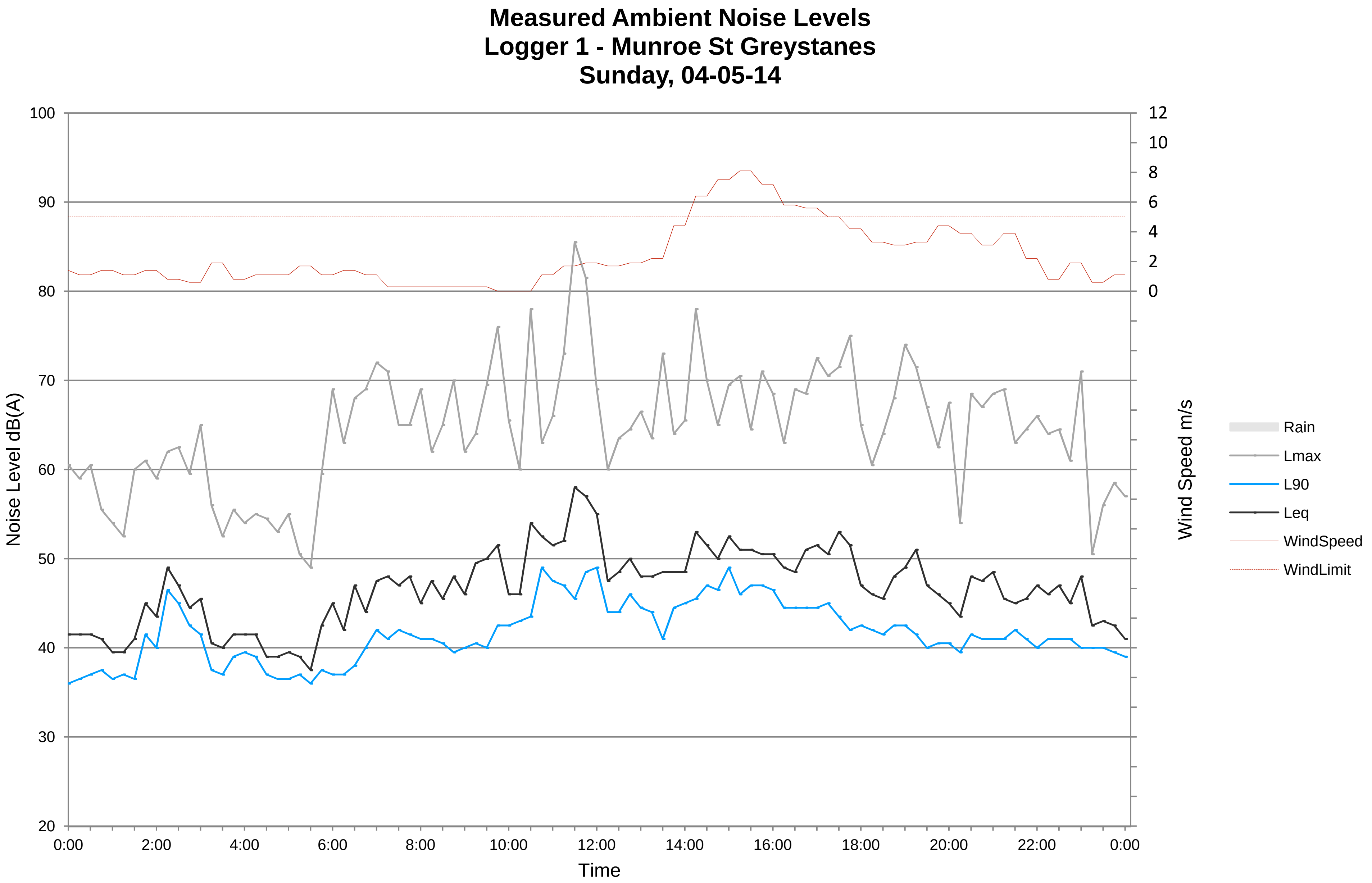
Date	ABL Day	ABL Evening	ABL Night	Leq 11hr Day	Leq 4hr Evening	Leq 9hr Night
Friday, 02-05-14	0	35.4	29.3	0	41.7	44.1
Saturday, 03-05-14	37.5	36.7	34.5	48.9	46.3	46.6
Sunday, 04-05-14	0	33.3	33.5	0	45.8	44.6
Monday, 05-05-14	33.9	37.1	35	45.8	42.6	43.3
Tuesday, 06-05-14	37.4	37.4	37.7	47.6	42.8	42.8
Wednesday, 07-05-14	39.4	40.5	37.6	46.1	45.8	43.2
Thursday, 08-05-14	41.2	39.2	37.2	46.6	43.7	43.6
Friday, 09-05-14	34.7	37.4	33	47.8	45.9	39.7
Saturday, 10-05-14	35.1	34.4	33.2	46.8	41.5	40.9
Sunday, 11-05-14	34.4	36.6	35.2	46.7	42	42.6
Monday, 12-05-14	40.3	0	0	46.6	0	0
Tuesday, 13-05-14	0	0	0	0	0	0
Summary Values						
RBL	**37**	**37**	**35**			
Leq				**47**	**44**	**44**

Notes: '0' indicates periods with too few valid samples due to weather or logger operation.

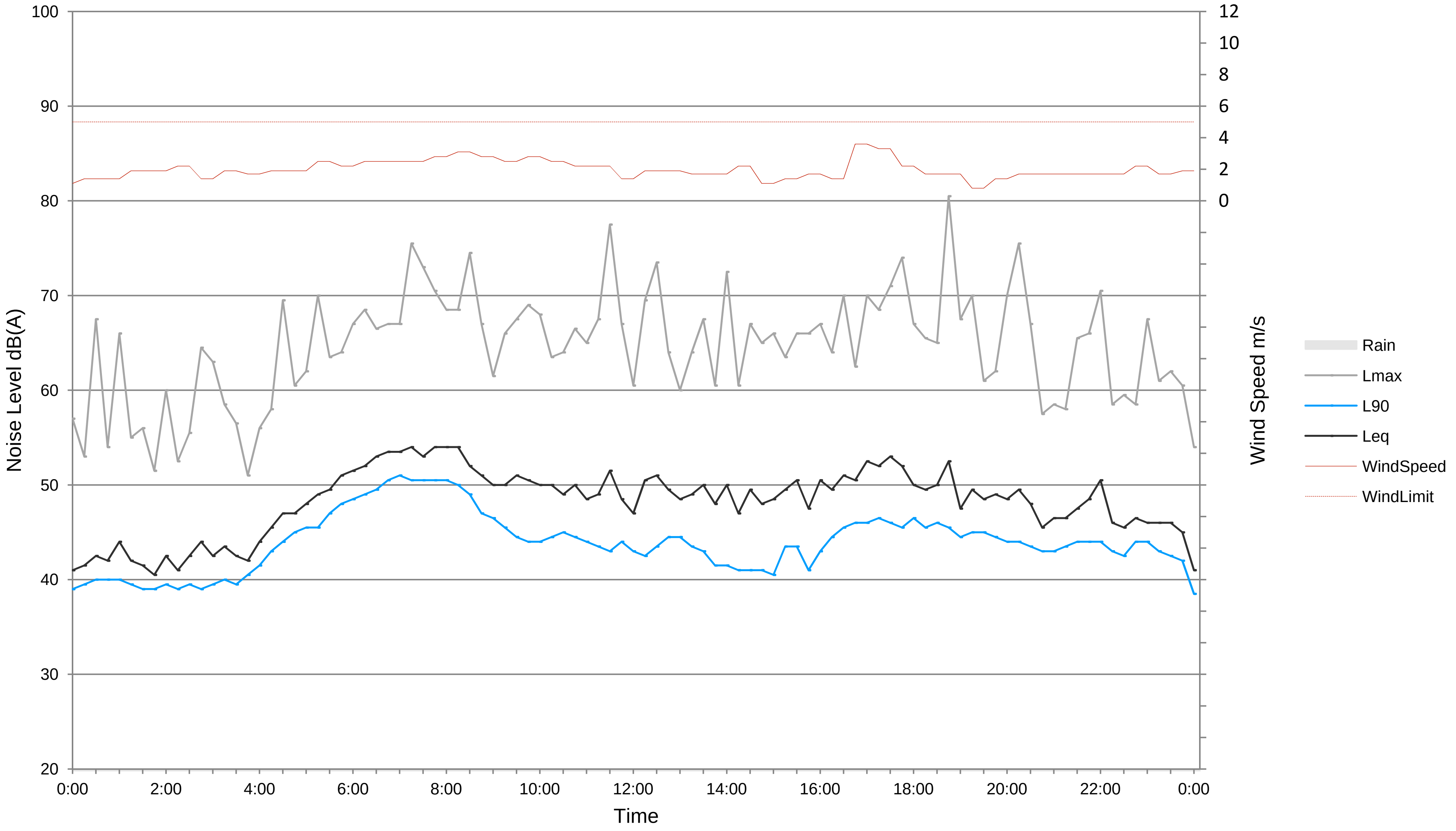

Measured Ambient Noise Levels
Logger 1 - Munroe St Greystanes
Friday, 02-05-14
Noise Level dB(A)
100
90
80
70
60
50
40
30
20
Wind Speed m/s
12
10
8
6
4
2
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
Time
Rain
Lmax
L90
Leq
WindSpeed
WindLimit

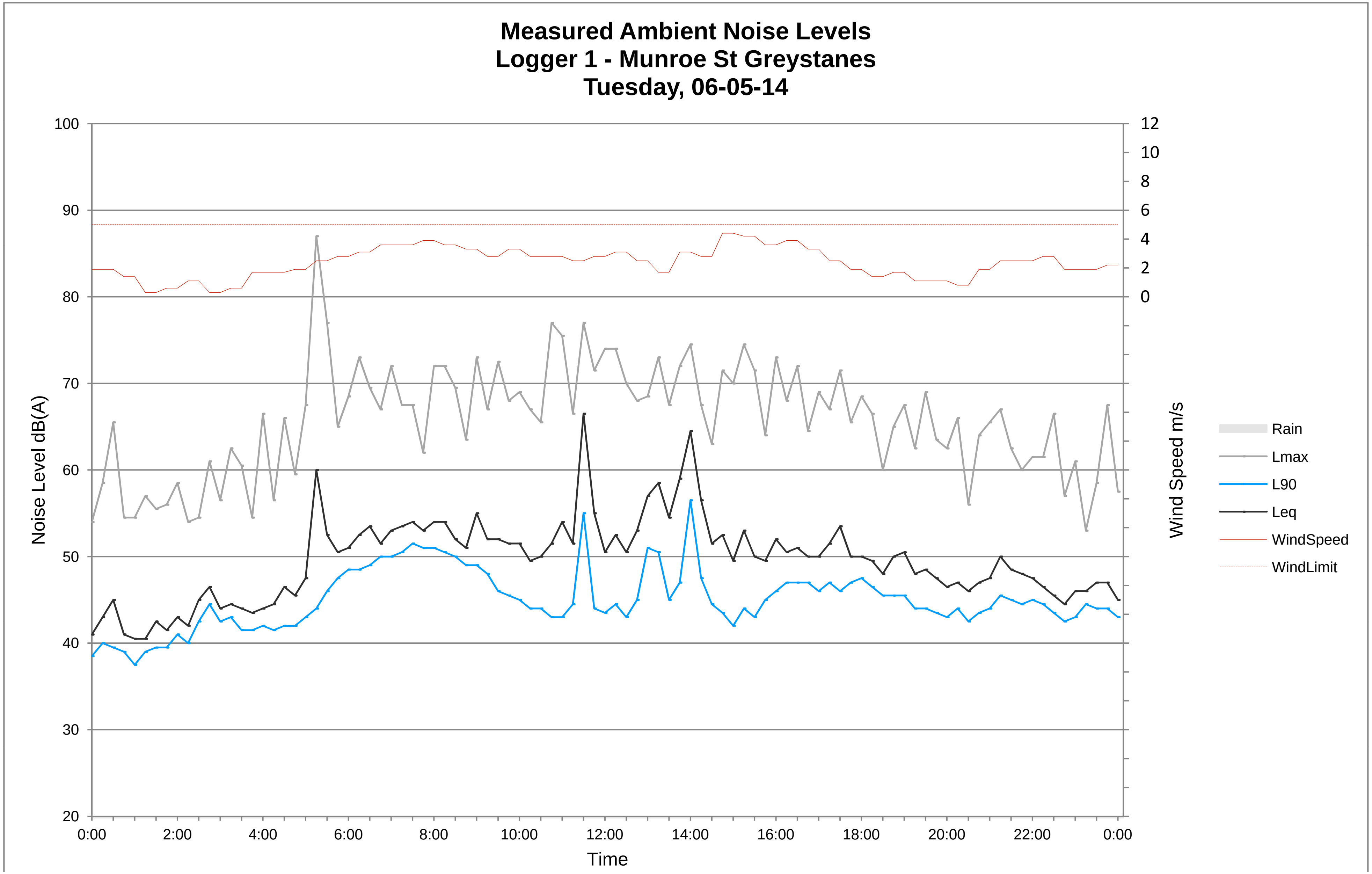
Measured Ambient Noise Levels
Logger 1 - Munroe St Greystanes
Saturday, 03-05-14




Measured Ambient Noise Levels
Logger 1 - Munroe St Greystanes
Sunday, 04-05-14
Noise Level dB(A)
100
90
80
70
60
50
40
30
20
Wind Speed m/s
12
10
8
6
4
2
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
Time
Rain
Lmax
L90
Leq
WindSpeed
WindLimit

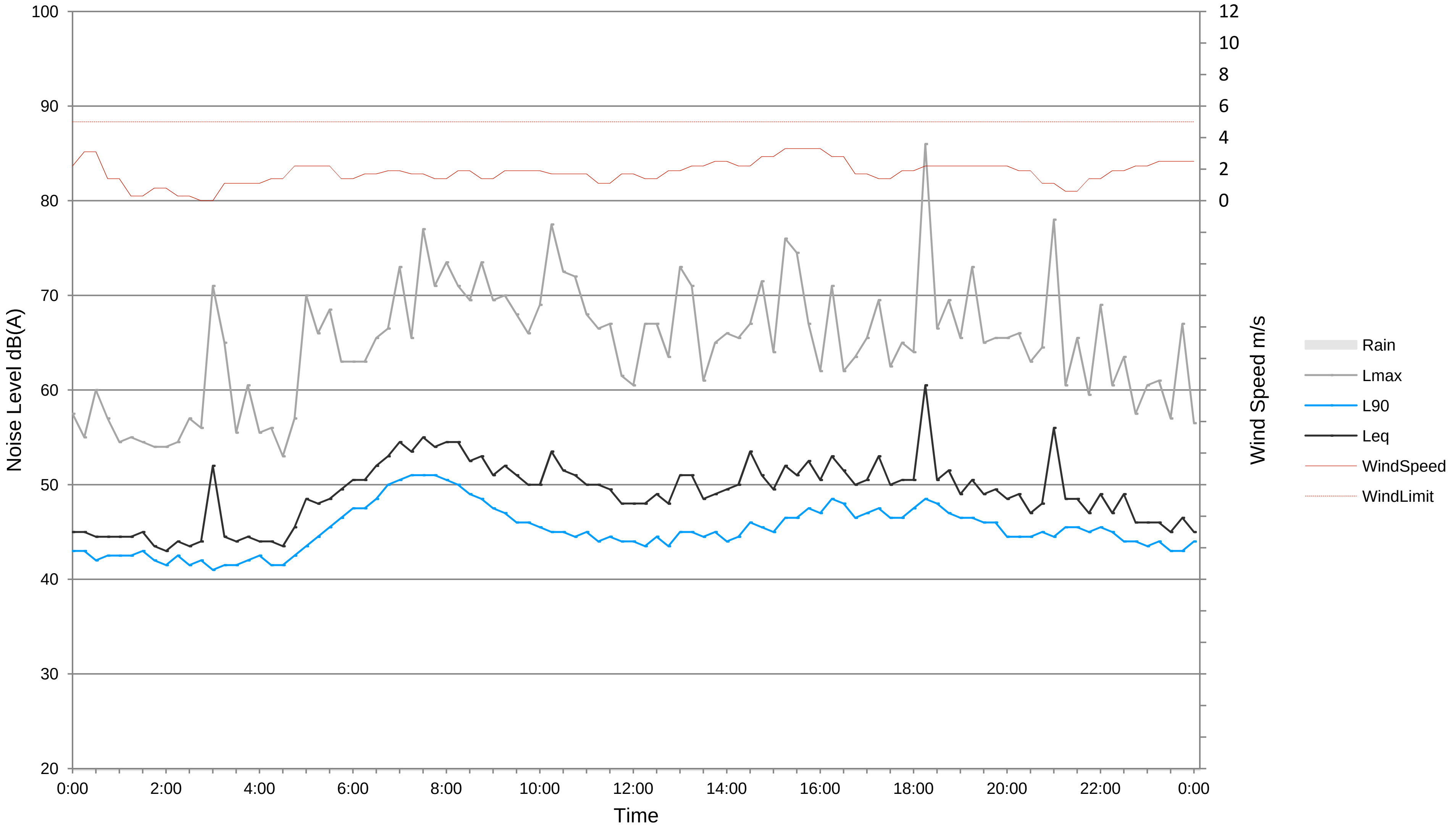
Measured Ambient Noise Levels
Logger 1 - Munroe St Greystanes
Monday, 05-05-14



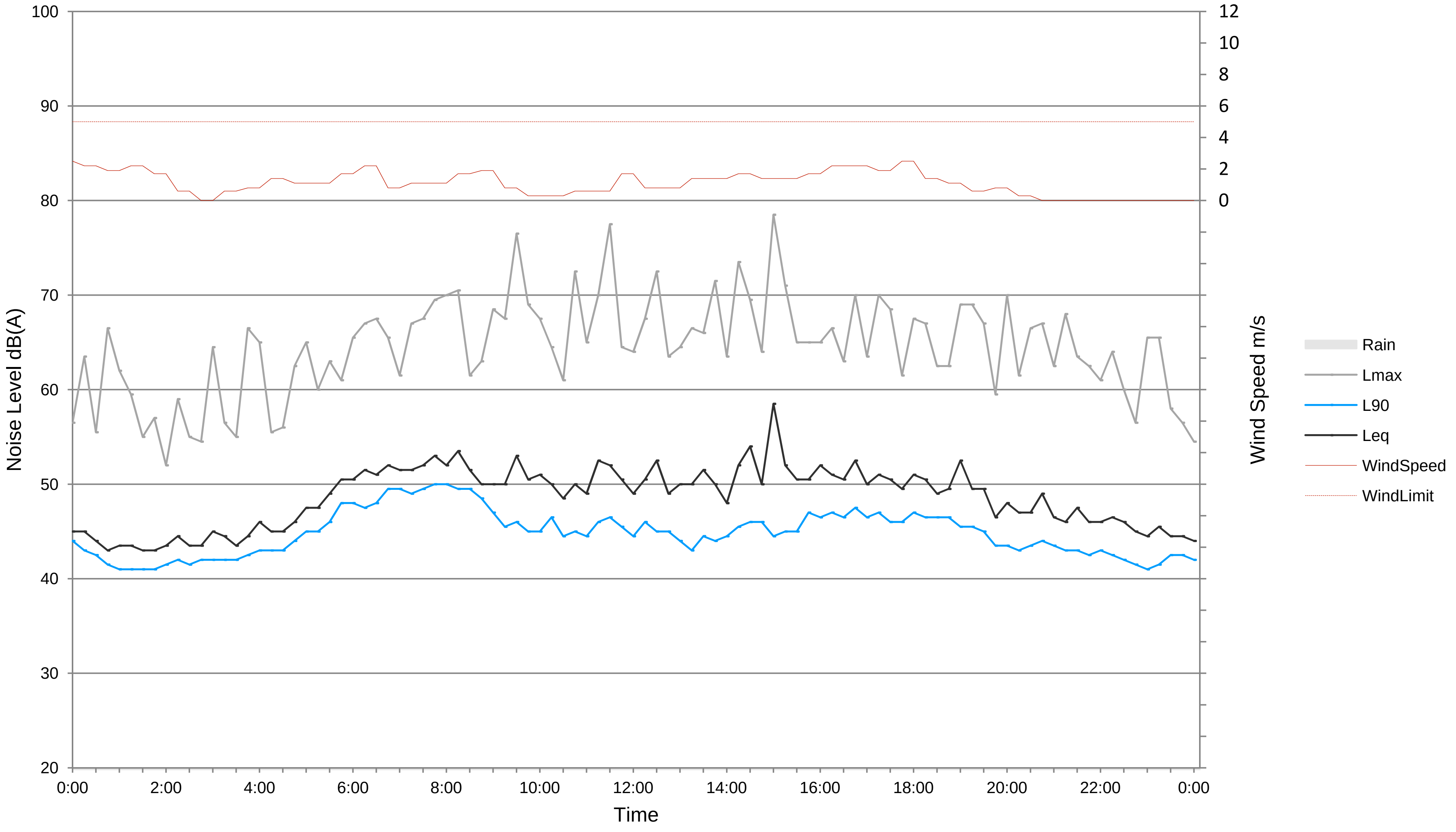


Measured Ambient Noise Levels
Logger 1 - Munroe St Greystanes
Tuesday, 06-05-14

Measured Ambient Noise Levels
Logger 1 - Munroe St Greystanes
Wednesday, 07-05-14



Measured Ambient Noise Levels
Logger 1 - Munroe St Greystanes
Thursday, 08-05-14



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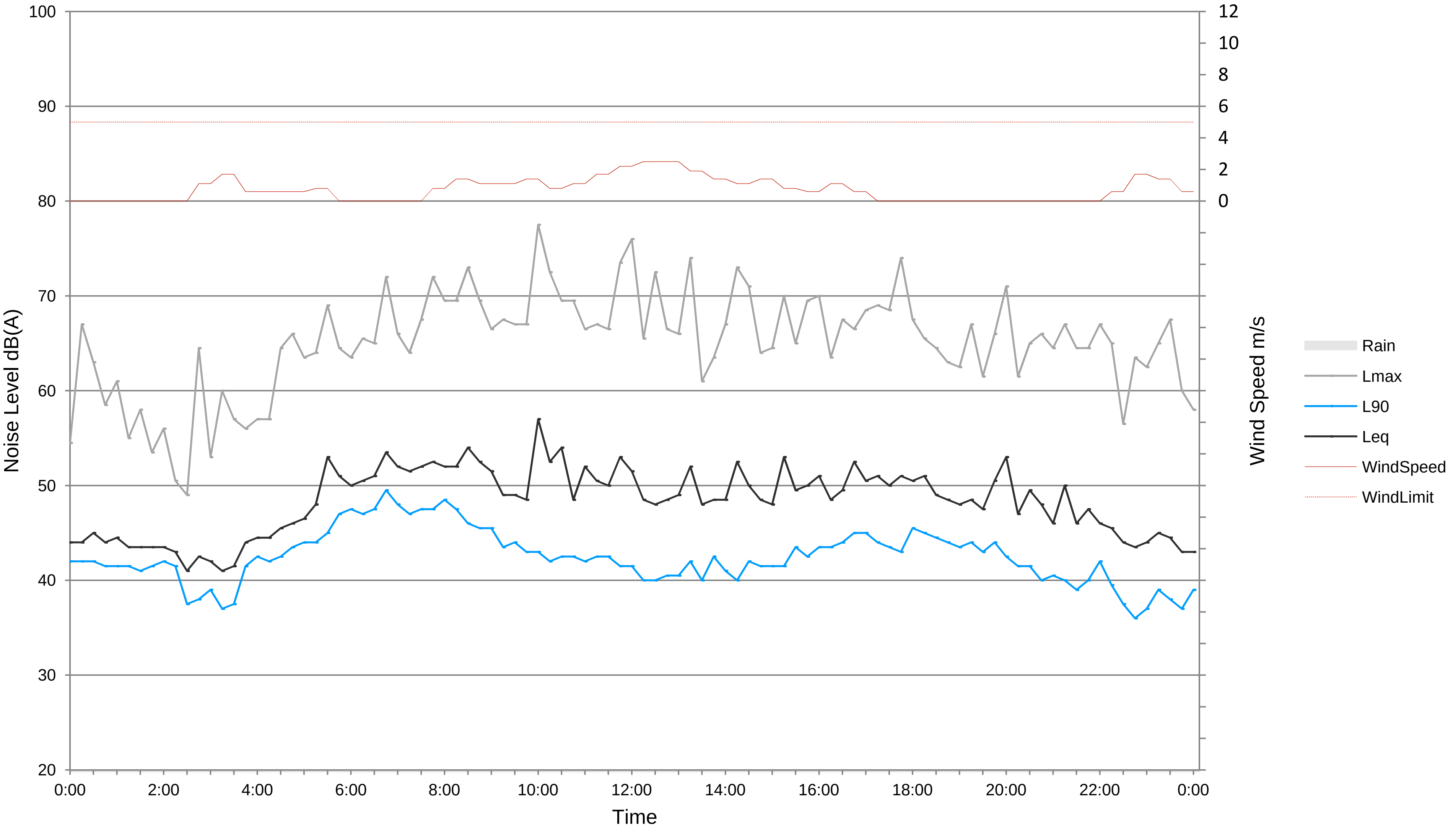

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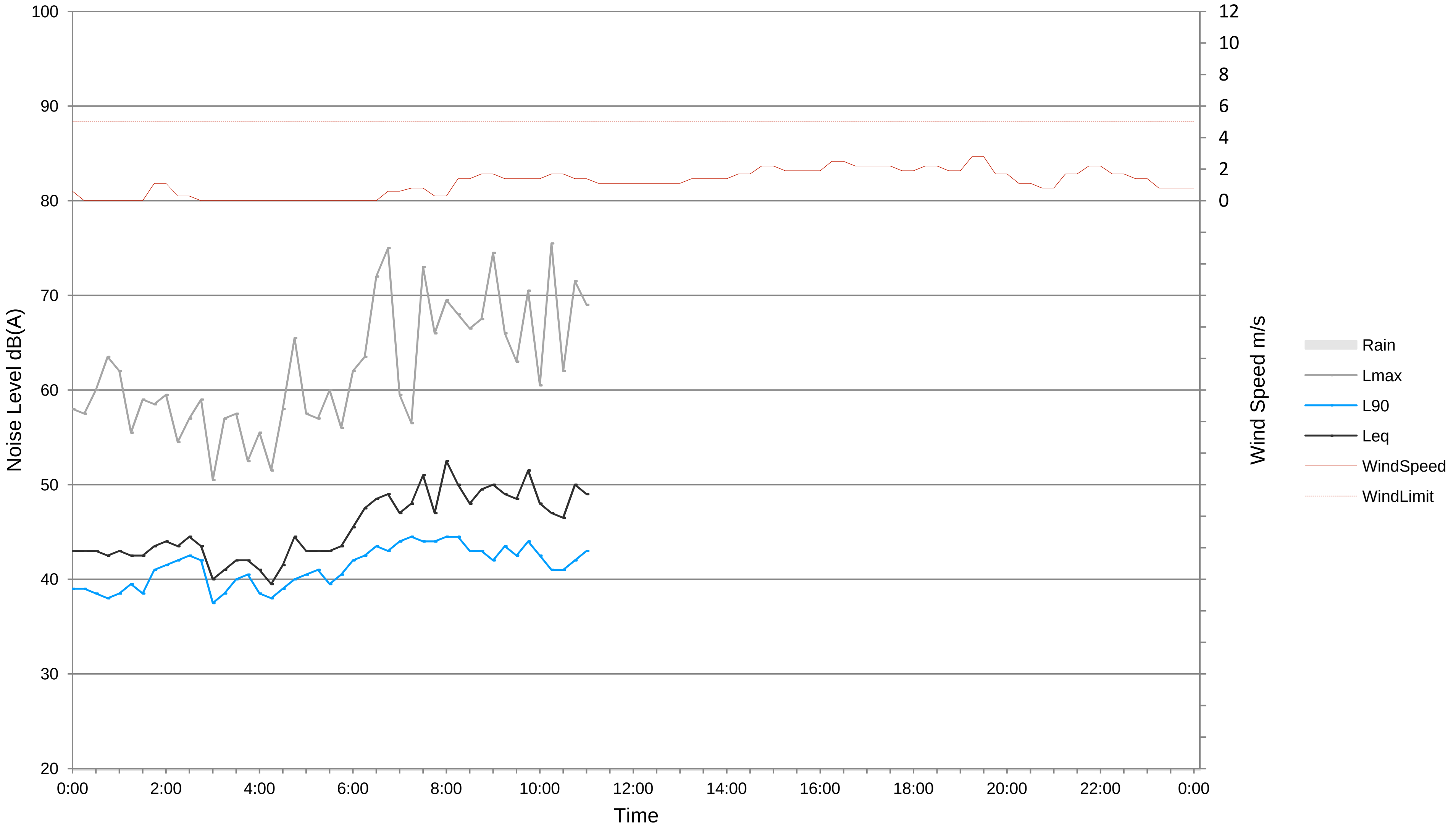

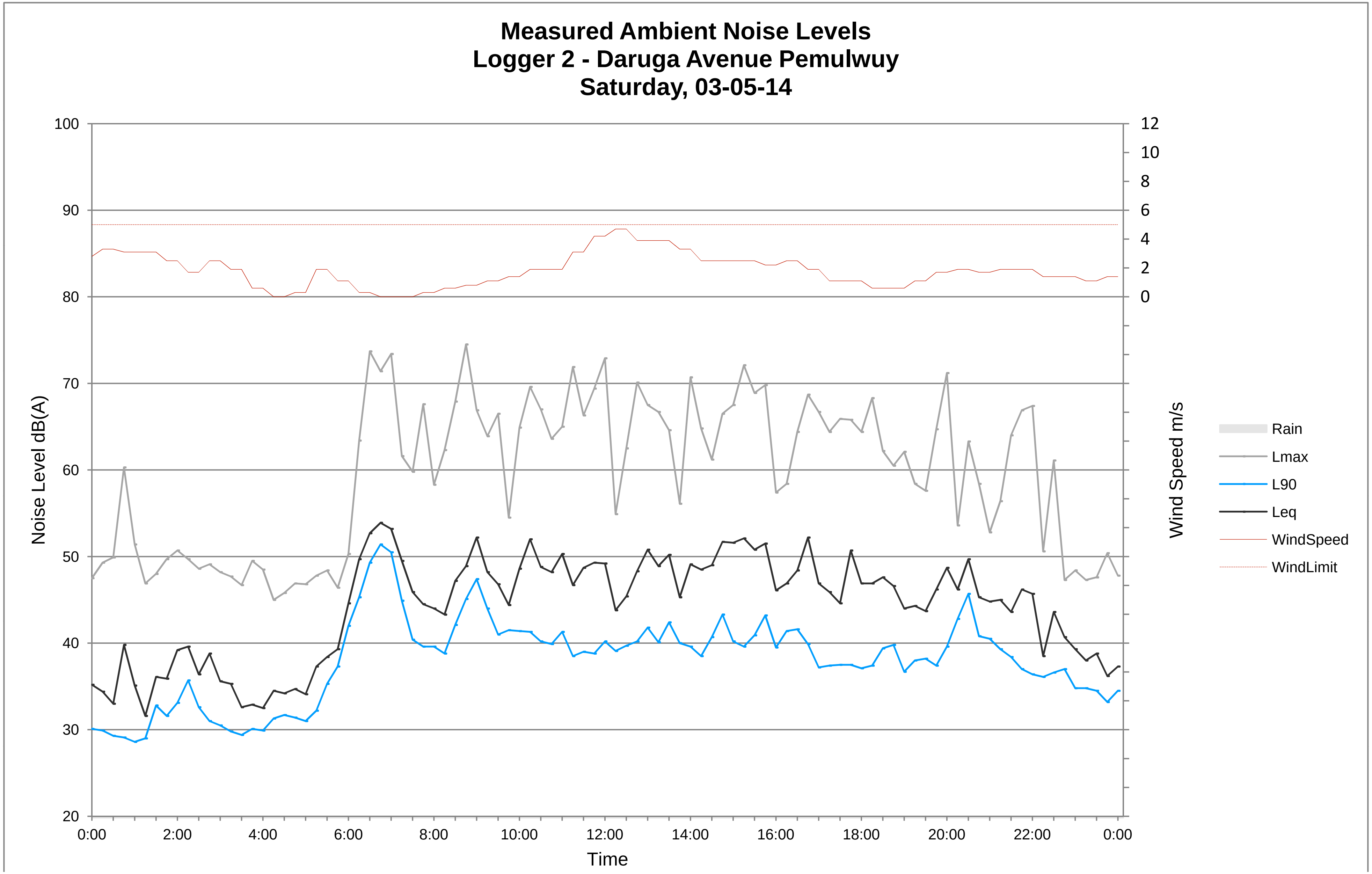
Measured Ambient Noise Levels
Logger 2 - Daruga Avenue Pemulwuy
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Noise Level dB(A)
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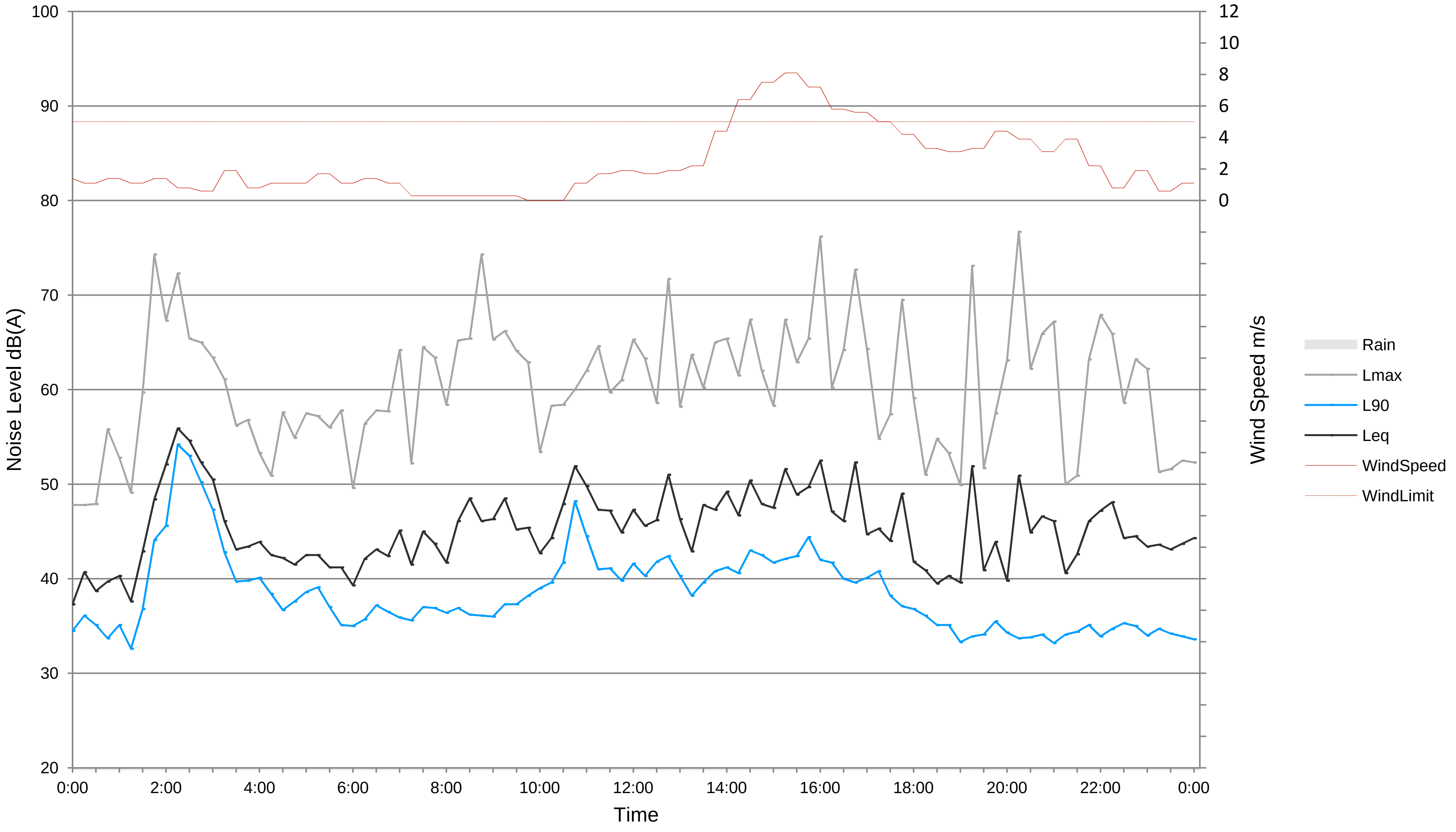
90
80
70
60
50
40
30
20
Wind Speed m/s
12
10
8
6
4
2
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
Time
Rain
Lmax
L90
Leq
WindSpeed
WindLimit

Measured Ambient Noise Levels
Logger 2 - Daruga Avenue Pemulwuy
Sunday, 04-05-14



Measured Ambient Noise Levels
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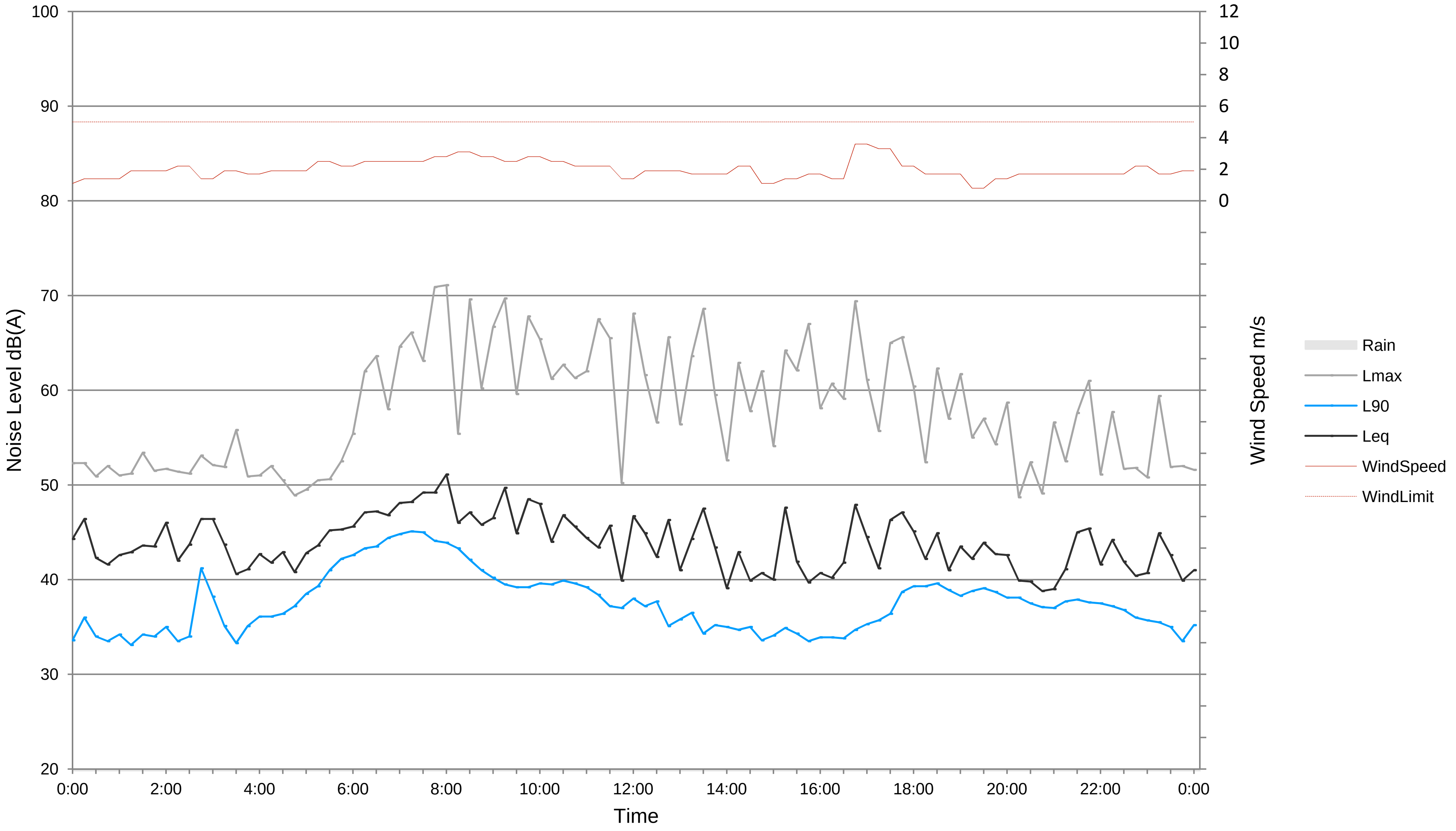
Monday, 05-05-14



Measured Ambient Noise Levels
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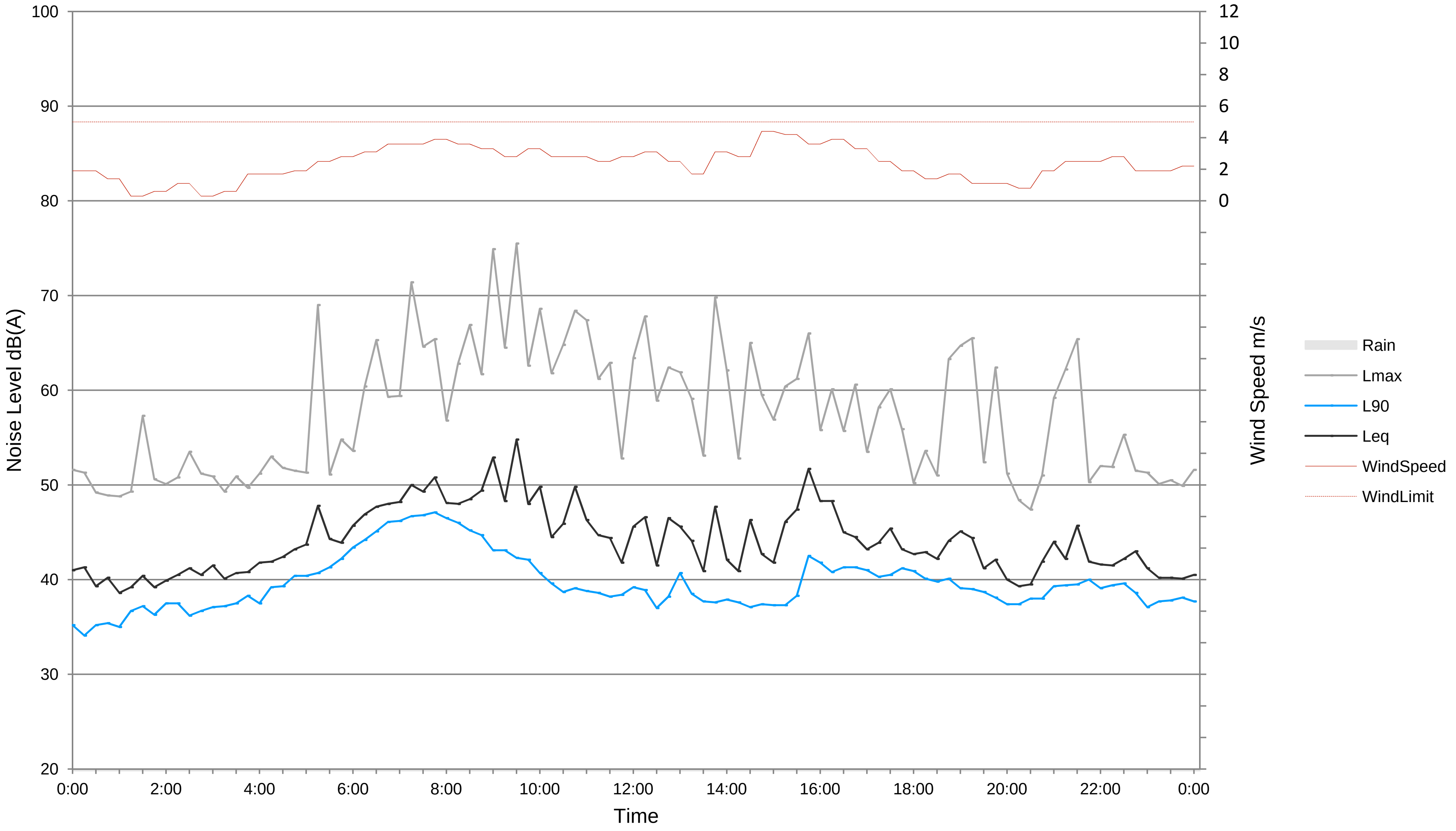
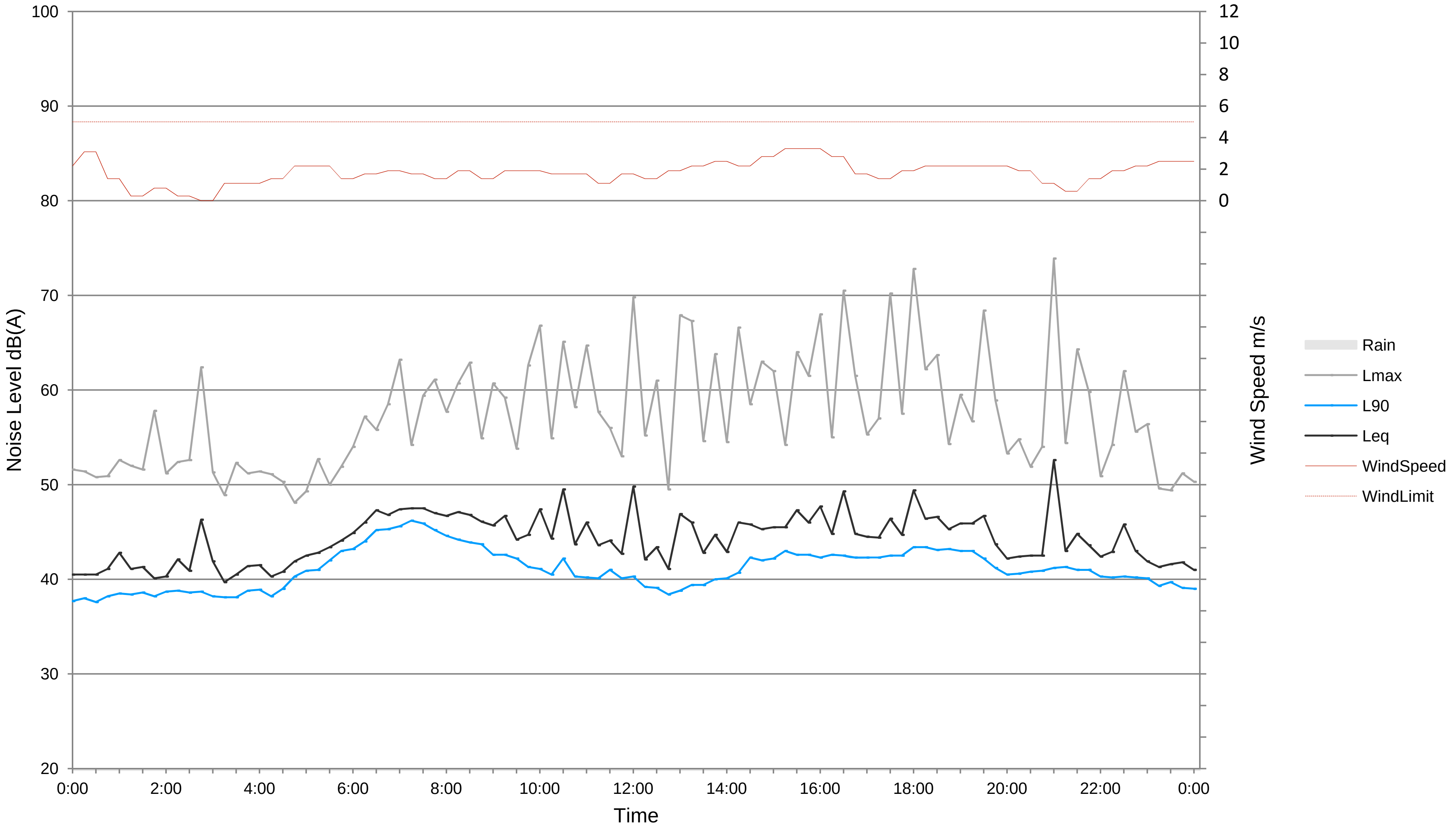
Tuesday, 06-05-14



Measured Ambient Noise Levels
Logger 2 - Daruga Avenue Pemulwuy
Wednesday, 07-05-14



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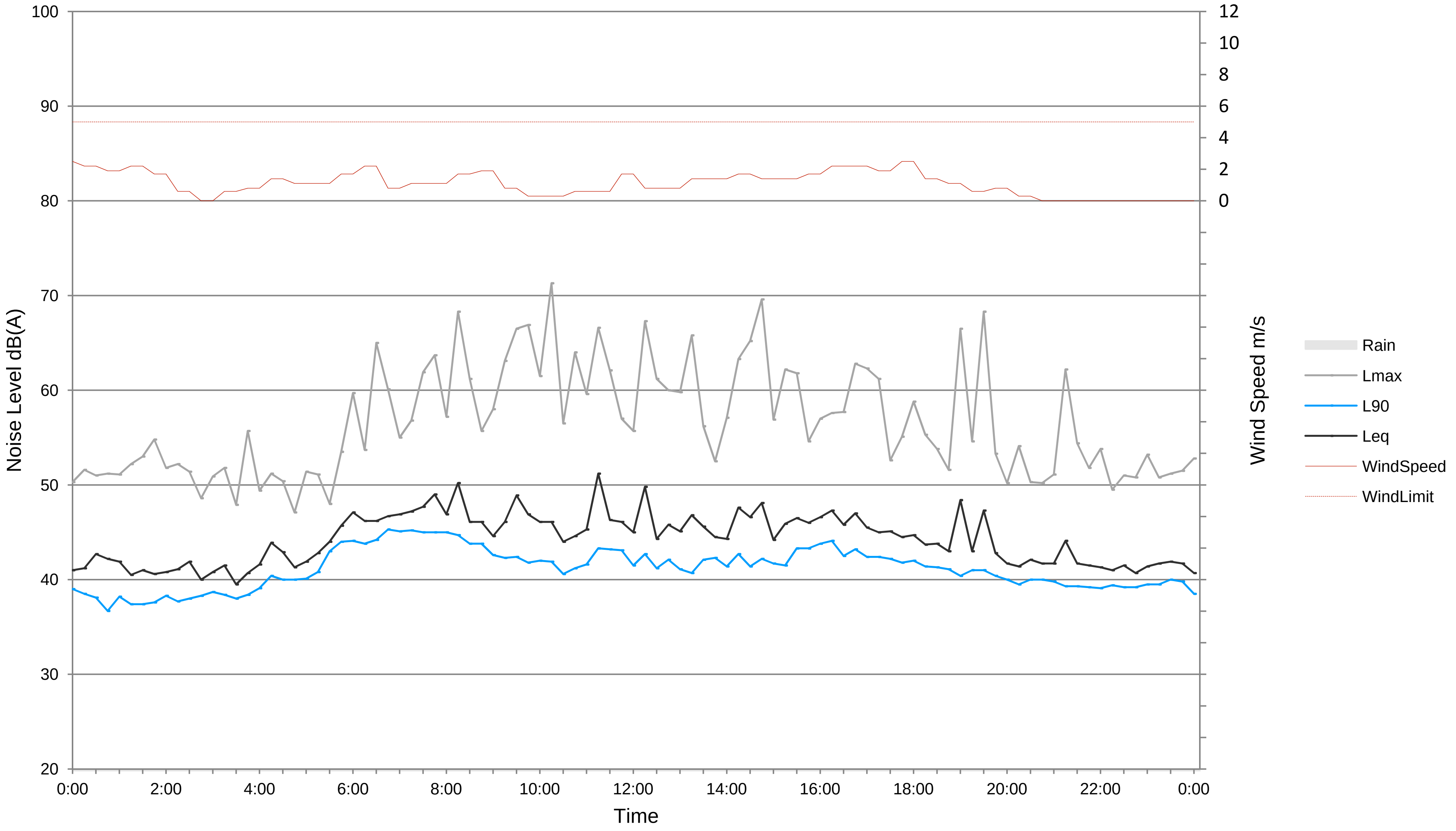
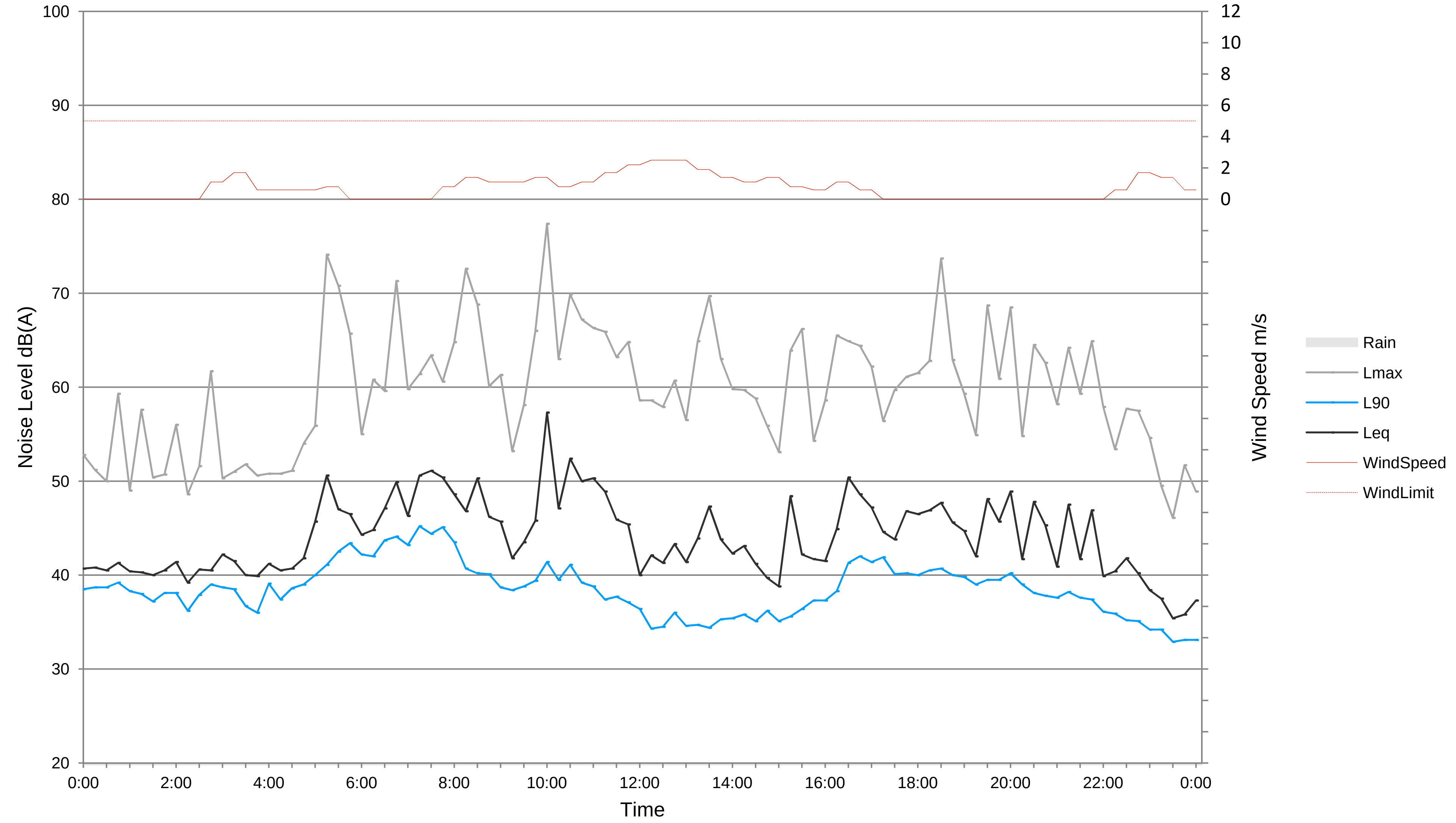
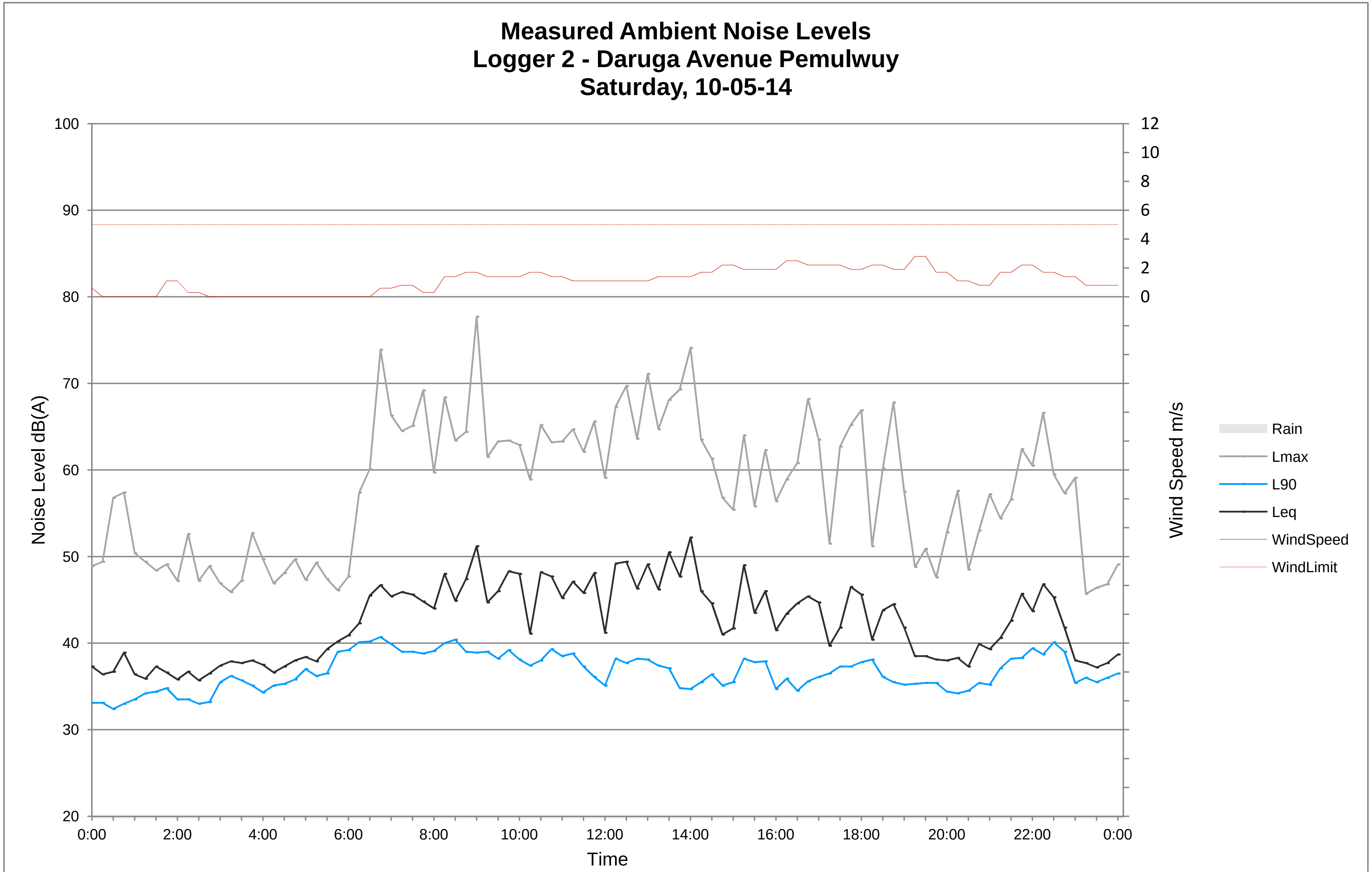


Measured Ambient Noise Levels
Logger 2 - Daruga Avenue Pemulwuy
Friday, 09-05-14

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Saturday, 10-05-14
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60
50
40
30
20
Wind Speed m/s
12
10
8
6
4
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0
0:00
2:00
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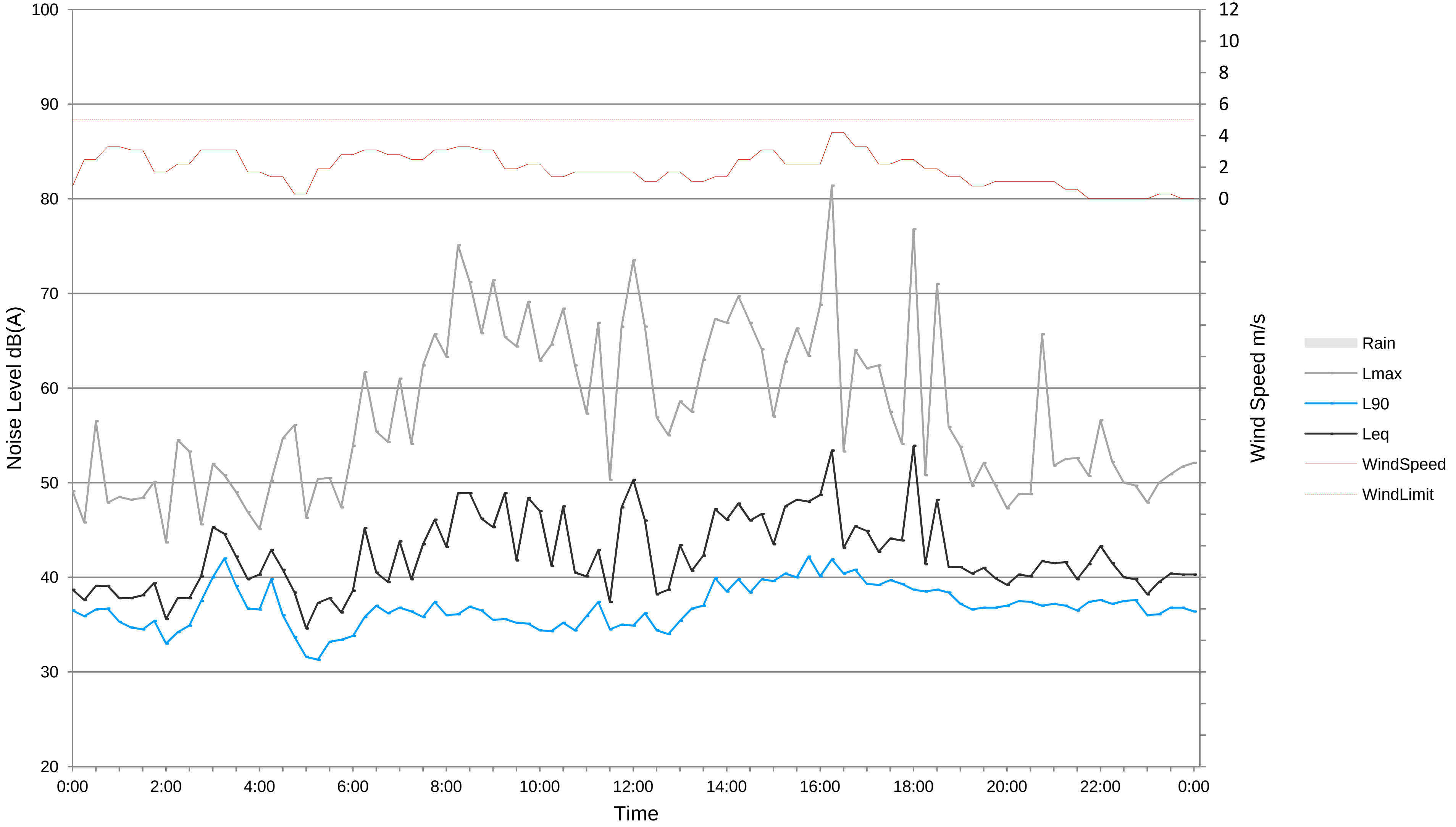
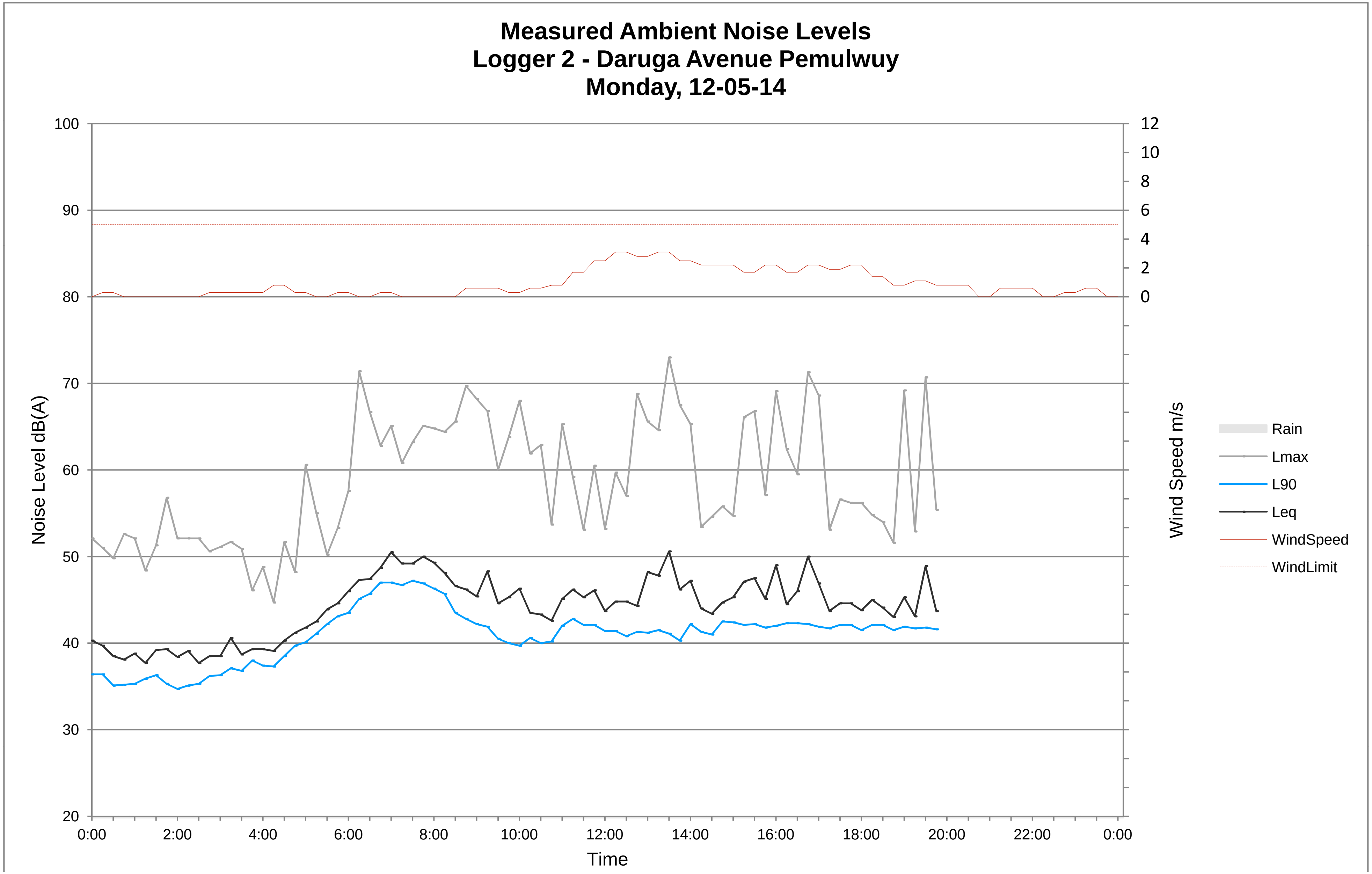
14:00
16:00
18:00
20:00
22:00
0:00
Time
Rain
Lmax
L90
Leq
WindSpeed
WindLimit

Measured Ambient Noise Levels
Logger 2 - Daruga Avenue Pemulwuy
Sunday, 11-05-14




Measured Ambient Noise Levels
Logger 2 - Daruga Avenue Pemulwuy
Monday, 12-05-14
Noise Level dB(A)
100
90
80
70
60
50
40
30
20
Wind Speed m/s
12
10
8
6
4
2
0
Time
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
Rain
Lmax
L90
Leq
WindSpeed
WindLimit

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NEWCASTLE
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Newcastle, New South Wales, 2300
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BRISBANE
Level 4, Suite 01, 87 Wickham Terrace
Spring Hill, Queensland, 4000
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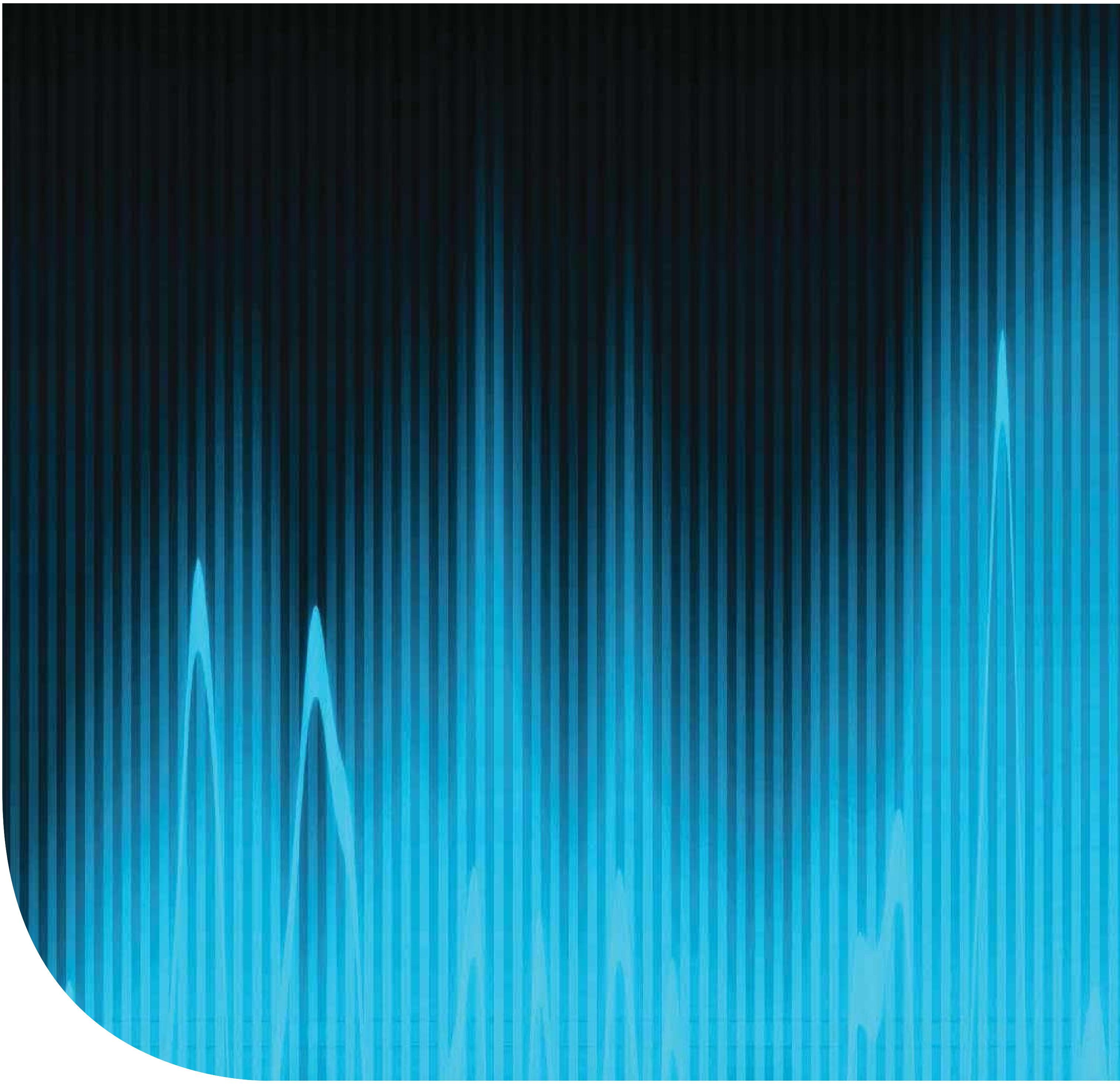

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Appendix C

Dust management plan

Intended for
Boral Recycling Pty Limited

Document type
Report

Date
January 2018

WIDEMERE RECYCLING FACILITY
DUST MANAGEMENT PLAN

RAMBOLL ENVIRON

WIDEMERE RECYCLING FACILITY
DUST MANAGEMENT PLAN

Revision	Date	Made by	Checked by	Approved by	Signed
Rev 2	30/01/2018	S. Fishwick	R. Kellaghan	S. Fishwick	
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1. INTRODUCTION

This dust management plan (DMP) has been prepared for the Widemere Recycling Facility (the facility), owned and operated by Boral Recycling Pty Ltd (Boral). The Operational Environmental Management Plan of which this DMP is a sub-plan, covers the entire Development and applies to a processing capacity at the facility of up to 1,000,000 tonnes per annum (tpa).

The DMP has been prepared to meet condition C17 of the development consent for the facility. Specifically, C17 states the following:

> *As part of the OEMP (Operational Environment Management Plan), required under condition D2 of this consent, the Applicant shall prepare a Dust Management Plan. The Plan must:*
>
> *a) Be prepared by a suitably qualified and experienced person(s) in consultation with the EPA;*
>
> *b) Be approved by the Secretary prior to the commencement of expanded operations;*
>
> *c) Identify all major sources of dust that may occur as a result of the operation of the development;*
>
> *d) Describe the procedures to manage the emission of dust from the sources identified;*
>
> *e) Identify the locations where monitoring of dust emissions is to be undertaken;*
>
> *f) Describe the procedures for the monitoring of dust emissions from the development, in accordance with any requirements of the EPL;*
>
> *g) Provide protocols for regular maintenance of process equipment to minimise the potential for dust emissions;*
>
> *h) Detail the deployment for regular maintenance of process equipment to minimise the potential for dust emissions;*
>
> *i) Detail the deployment of the mitigation measures identified in Condition C16; and*
>
> *j) Describe the procedures to be undertaken if any non-compliance is detected.*

Condition C16, referenced in the above condition C17, states:

> *The Applicant shall:*
>
> *a) Operate the Development so that air emissions are minimised during all meteorological conditions;*
>
> *b) Implement best management practice, including all reasonable and feasible air emissions mitigation measures to minimise emissions from the Development, including but not limited to :*
>
> *i) Limiting vehicle speed on-site to 30 kilometres per hour;*

> *ii) Ensuring all loaded vehicles entering or leaving the site have their loads covered;*
>
> *iii) Ensuring all loaded vehicles leaving site are cleaned of dirt, sand and other materials before the leave the site, to avoid tracking these material on public roads; and*
>
> *iv) Dust sprays through chemical suppressants, water sprays/misters.*

1.1 Key documents

The preparation of this DMP has taken the following documents into consideration:

- Development Consent for Application SSD 6525, dated 25 November 2016;
- Environment Protection License (EPL) 11815 for Widemere Recycling;
- Widemere Recycling Facility - Air Quality Impact Assessment, prepared by Environ Australia Pty Ltd, dated 29 May 2015;
- Approved Methods for the Modelling and Assessment of Air Pollutants in NSW, NSW EPA, 2016; and
- Approved Methods for the Sampling and Analysis of Air Pollutants in NSW, NSW EPA, 2007.

2. EMISSION SOURCES AND MITIGATION MEASURES

The air quality impact assessment (AQIA) completed in 2015 for the facility (Environ, 2015), involved the quantification of dust emissions from onsite operations at a rate of 1,000,000tpa. Potential sources of particulate matter emissions were identified as the following:

- Vehicle entrainment of particulate matter due to the haulage of material along the sealed and unsealed haul roads about the facility;
- Unloading of material to the raw material storage area;
- Breaking of larger material and handling to stockpiles/crusher hopper;
- Crushing and screening plant operations;
- Conveying, transfer points and loading of crushed rock material to stockpiles;
- Handling and transfer of crushed material to blend plant;
- Blend plant and handling/stockpiling of blended final product;
- Loading of product to truck for dispatch; and
- Wind erosion associated with exposed areas and material stockpiles.

In the AQIA, particulate matter emissions from these sources were quantified for three size fractions, namely:

- Total Suspended Particulates (TSP);
- particulate matter with an equivalent aerodynamic diameter of 10 microns (PM_{10}); and
- particulate matter with an equivalent aerodynamic diameter of 2.5 microns ($PM_{2.5}$).

Individual emissions sources at the facility were grouped into the following primary source categories:

- Wheel generated dust – paved roads;
- Wheel generated dust – paved roads;
- Material handling (truck unloading, handling by mobile plant, loading to trucks);
- Material processing (crushing, screening, conveying); and
- Wind erosion of stockpiles and exposed surfaces.

The total TSP, PM_{10} and $PM_{2.5}$ emissions from each category are ranked in **Table 2-1**. From the source category ranking, the movement of trucks and vehicles across unpaved surfaces is the largest particulate matter emission source at the facility.

Table 2-1 Emission source ranking

Emission source category	**Rank of emission source by particulate matter size fraction**		
	TSP	**PM_{10}**	**$PM_{2.5}$**
Wheel generated dust – paved roads	2	3	3
Wheel generated dust – unpaved roads	1	1	1
Material handling (truck unloading, handling by mobile plant, loading to trucks)	3	2	2
Material processing (crushing, screening, conveying)	4	4	4
Wind erosion of stockpiles and exposed surfaces	5	5	5

The mitigation measures for each of the primary source categories are presented in **Table 2-2**. The layout of the existing dust management system at the facility is illustrated in **Figure 2-1**.

In accordance with condition C15 of development consent SSD 6525, the facility shall also ensure compliance with any air quality limits in the EPL. However, there are no provisions for air quality limits in EPL 18815 and as such they have not been included in this AQMP.

2.1 Equipment maintenance regime

To ensure the ongoing effectiveness of these measures, the performance of all onsite mitigation measure technology is routinely checked and serviced to maintain ongoing performance to original specifications.

Weekly site inspections are carried out by the site manager, site supervisors and leading hands. This is a visual inspection of sprays while they are operating. The weekly site inspections include checking that water sprays are on and that dust suppression measures are operating effectively in the stockpile yard. Any non-operational sprays are reported via the weekly inspection and repaired /replaced by Jeff Hill Plumbing Propriety Ltd.

Table 2-2 Emission source mitigation measures

Emission source category	Mitigation measures in place at the facility
Wheel generated dust – unpaved roads	• Wet suppression of haul roads is undertaken by one water cart on a regular basis • Travel speeds along all unpaved roads within the facility are limited to 30km/hr. While this is a site safety measure, reduce vehicle travel speed minimises dust generation. • Primary unsealed roads will be routinely maintained to minimise surface silt content and dust generation potential.
Wheel generated dust – paved roads	• All paved surfaces are routinely swept. The facility has one road sweeper at the site in operation. • Wet suppression of haul roads is undertaken by one water cart on a regular basis • Travel speeds along all unpaved roads within the facility are limited to 30km/hr. While this is a site safety measure, reduce vehicle travel speed minimises dust generation. • All trucks leaving site must pass through one of two wheel wash facilities prior to exiting. • All loaded vehicles entering or leaving site must have their loads covered.
Material handling (truck unloading, handling by mobile plant, loading to trucks)	• Three sprays are installed within the material receivables area to apply wet suppression to truck unloading emissions. • The use of water sprays in the crushing and screening plant, the blending plant and at material stockpiles aids to increase the moisture content of product material and reduce the dust generation potential of material loaded to stockpiles and dispatched to market. • Minimise the fall distance of material from plant (excavator, FEL, etc) to load point (truck, stockpile, etc). • Ceasing of material handling activities under dry, windy conditions with excessive visual dust generation.
Material processing (crushing, screening, conveying)	• Twelve water sprays are fitted across the crushing and screening plant and the blending plant. • Water cannons are used on crushing and screening areas to manage dust generation by wind from raw feed stockpiles. • Secondary crusher is fitted with enclosure. New water spray fitted to crusher exit in September 2017. • Conveyor belts and transfer points will be routinely cleaned of overspill.
Wind erosion of stockpiles and exposed surfaces	• A network of 18 fixed water sprinklers are fitted around site to control various stockpiling areas (both raw material and product). • Water cannon mounted to the water carts are used to apply wet suppression to areas not reached by the water sprinkler network. • Stockpile heights are limited to 20m.

Figure 2-1: Facility Stockpile Map and Dust Management Map

3. AIR QUALITY MONITORING AND CRITERIA

3.1 Particulate matter monitoring

3.1.1 Methodology and criteria

Condition M2 of the EPL for the facility identifies the air quality monitoring requirements for the facility, which are the continuous monitoring of particulates (deposited matter), in accordance with method AM-19 (NSW EPA, 2007)[1].

Method AM-19 relates to the sampling of dust deposition rates on a monthly basis, in accordance with *AS/NZS 3580.10.1:2003 - Methods for sampling and analysis of ambient air - Determination of particulate matter - Deposited matter - Gravimetric method*.

This method prescribes that samples are collected every 30 ± 2 days and sent to an appropriate laboratory for analysis of the following parameters:

- Insoluble solids – relates to the total filterable material within each sample;
- Ash content – relates to the reside remaining following sample combustion by the laboratory (e.g. non-combustible crustal material);
- Combustible material – sample content that is lost during sample combustion (biological material, coal, etc).

For assessment against regulatory compliance, insoluble solids are compared to the criteria of **4g/m^2/month** as an annual average. A complete 12 months of dust deposition monitoring is therefore required to assess compliance.

For the purpose of the project, a sample with a high ash content relative to the insoluble solids may be indicative of the influence of emissions from the facility.

Sample notes should be made at the time of collection each month, detailing the amount of water in the sample, presence of any insect/leaf matter/bird droppings, colour of the sample, clear evidence of sample contamination and anything else that may be of use for the interpretation of sample laboratory results.

3.1.2 Monitoring locations

Dust deposition rates are recorded at two locations at the facility:

- DDG1 – southeast corner of site near the pond; and
- DDG2 – southwest corner of the site.

The location of these two dust deposition gauges are illustrated in **Figure 3-1**.

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[1] NSW EPA (2007) Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales, January 2007

Figure 3-1: Air quality monitoring locations

3.1.3 Dust deposition monitoring results

The results of the dust deposition monitoring conducted at the two monitoring locations since January 2012 have been collated, with the annual average dust deposition rate (reported as insoluble solids) calculated. The annual average dust deposition results are presented in **Table 3-1**.

Table 3-1 Site dust deposition monitoring

Year	Dust deposition rate (g/m^2/month)		
	DDG1	DDG2	Criteria
2012	3.1	3.6	4
2013	4.8	5.1	4
2014	6.1	6.6	4
2015	4.9	6.6	4
2016	5.7	7.6	4
2017	9.0	7.4	4

It can be seen from the results presented in **Table 3-1** that the recorded results are above the NSW EPA assessment criteria at both locations for the years between 2013 and 2017 inclusive. It is noted that the monitoring locations are sited within or at site boundary and in close proximity to operational emission sources, in particular the unpaved haul road to the south and materials stockpiling area. The locations of the monitoring equipment are not representative of offsite sensitive receptors and the selection of alternative monitoring locations is under consideration.

3.2 Meteorological monitoring

Condition O6.3 of the EPL requires that a meteorological station is established and maintained onsite that complies with the requirements of the NSW EPA (2007), specifically:

- AM-1 - *AS/NZS 3580.1.1:2007 Methods for sampling and analysis of ambient air - Guide to siting air monitoring equipment* (Standards Australia, 2007);
- AM-2 - *AS 3580.14-2011 Methods for sampling and analysis of ambient air - Meteorological monitoring for ambient air quality monitoring applications* (Standards Australia, 2011); and
- AM-4 - *Meteorological monitoring guidance for regulatory modelling applications* (USEPA 2000).

The above documents provide guidance on the site selection and parameters required for monitoring.

The weather station should be configured with an appropriate 10m high mast. The key meteorological parameters that should be recorded by the onsite meteorological station include:

- Wind speed and direction at 10m above ground;
- air temperature at 2m and 10m above ground;
- rainfall;
- relative humidity;
- barometric pressure;
- solar radiation.

Condition O6.3 of the EPL requires that a meteorological monitoring data must be provided to any authorised officer of the EPA. A web-based data interface can be readily configured for the meteorological station to facilitate this data presentation requirement.

Should the weather station be non-operational due to outage or equipment failure weather station data shall be accessed from the closest appropriate Bureau of Meteorology monitoring station (Prospect Reservoir or Horsley Park Equestrian Centre).

4. DATA AND INCIDENT REPORTING

4.1 Monitoring results reporting

Monitoring results from the onsite dust deposition will be posted on the Boral website for public display, in a relevant location for the facility, within one month of receipt of sample analysis.

Monthly results are collated into a spreadsheet for ongoing calculation of annual average for compliance with the assessment criteria of 4g/m^2/month. Sample observation notes are added to the results spreadsheet.

A yearly report showing the annual average and 12 month rolling average of deposited dust results will be prepared for the EPL Annual Return and Annual Review. Contaminated samples are noted and excluded from annual average calculations (e.g. bird droppings, insects, adjacent construction works, tampering of gauges, etc);.

4.2 Exceedance event actions

In the event of an individual month insoluble solids result above the criteria, the following steps are to be taken:

- review of the sample ash content, sample notes will be conducted to determine if site operations are the likely contributing source;
- Should the samples indicate that site operations were a contributing source (elevated ash contents), meteorological conditions and operations during that month will be reviewed, with the aim to identify the contributing emissions source or activity; and
- Applicable management practices will be reviewed and improved as required.

4.3 Complaints reporting

Any complaint received by Boral regarding dust impacts from the facility will be acted on within 24-hours in the following manner:

- Details of the complaint (date, time, specifics, complainants contact details) will be noted;
- Activities occurring during the complaint period to be investigated. Coincident meteorological conditions (wind speed and direction, air temperature, recent rainfall) to be analysed;
- Log findings of operations and meteorological condition review during the complaint period in the complaints register. Review management practices as necessary;
- Respond to complainant with findings of the review.

The details of any dust-related complaint will be logged in an appropriate register, with investigation findings and actions noted. All complaints received will be listed in the EPL Annual Return and Annual Review.

4.4 Review of DMP

This DMP will be reviewed and revised as necessary:

- Every 12-months at the time of the EPL Annual Return and Annual Review;
- Following a significant change to facility operations (e.g. modification to approved operations); or
- Following receipt of review notification from the Department of Planning and Environment or NSW EPA in response to dust monitoring criteria exceedance.

Appendix D

Groundwater monitoring program

Groundwater Monitoring Program for Boral Widemere Recycling Facility

Prepared for Boral Recycling Pty Ltd| 26 May 2021

Groundwater Monitoring Program for Boral Widemere Recycling Facility

Prepared for Boral Recycling Pty Ltd | 26 May 2021

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Groundwater Monitoring Program for Boral Widemere Recycling Facility

Final

Report J17038RP1 | Prepared for Boral Recycling Pty Ltd | 20 June 2017

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Signature		Signature	
Date	20/06/2017	Date	20/06/2017

Document Control

Version	Date	Prepared by	Reviewed by
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1 Introduction

EMM Consulting Pty Limited (EMM) has been engaged by Boral Recycling Pty Ltd (Boral) to conduct a groundwater monitoring program (GMP) for the Widemere Recycling Facility (the facility), off Widemere Road, Wetherill Park (Figure 1.1). The Operational Environmental Management Plan of which this GMP is a sub-plan, covers the entire Development and applies to a processing capacity at the facility of up to 1,000,000 tonnes per annum (tpa).

The facility separates, crushes and blends construction and demolition waste with quarry material to produce a range of recycled aggregate and road base products. Development approval (DA 25-11-2016-i) was granted on 25 November 2016 under the *Environmental Planning and Assessment Act 1979* (EP&A Act). The development involves expanding operations by increasing the processing capacity of the facility from 750,000 tonnes per annum (tpa) to 1,000,000 tpa, expanding the site stockpile area by 0.4 hectares (ha), increasing the waste streams processed at the site, modifying the hours of operation, and a realignment of an internal haul road.

The primary water management controls at the facility consist of a series of open and piped drainage lines, which drain to a sedimentation basin (referred as Basin 1). Basin 1 overflows into a second sedimentation basin (referred to as Basin 2). Basin 2 is progressively dewatered to provide water for on-site re-use.

At the time of writing the expanded operations have not yet commenced.

This GMP has been prepared for inclusion in the Operational Environmental Management Plan (OEMP) for the facility. The GMP outlines baseline data collected to date and ensures compliance with conditions C38, C39 and C40 of the facility's current development approval, which states:

> **Groundwater**
>
> C38. Within six months of the commencement of the expanded operations. The Applicant shall conduct a Groundwater Monitoring Program. The program must:
>
> a) be carried out by a suitably qualified and experienced expert in consultation with the EPA and to the satisfaction of the Secretary;
>
> b) assess the potential for leakage of the sediment basins to groundwater;
>
> c) detail baseline data, groundwater levels and quality against the relevant criteria;
>
> d) provide mitigation and contingency measures to prevent the sediment basins from leaking; and
>
> e) identify further groundwater monitoring if required.
>
> C39. Within three months of the commencement of the Groundwater Monitoring Program, the Applicant shall submit a copy of the Groundwater Monitoring Program as identified in Condition C38 to the Secretary and EPA.
>
> C40. The Applicant shall comply with any reasonable requirement(s) of the Secretary arising from *the Groundwater Monitoring Program.*

A network of groundwater monitoring bores was installed across the site in January 2017 (Figure 1.1). The network was designed to collect baseline data including local groundwater levels and groundwater quality to inform a conceptual hydrogeological model for the site. The monitoring network also enables assessment of potential seepage from the sediment basins.

Source: EMM (2017); LPMA (2014)

KEY

⊖ Monitoring bore

☐ Cadastral boundary

— Watercourse

Site location and monitoring sites

Boral Widemere
Groundwater Monitoring Program
Figure 1.1

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2 Conceptual groundwater model

2.1 Geology

The project area is situated in the eastern part of the Sydney Basin. The Sydney Basin predominantly comprises Permian and Triassic aged sedimentary rocks, underlain by undifferentiated sediments of Carboniferous and Devonian age.

The Bringelly Shale, part of the Triassic Wianamatta Group shales, comprises the majority of the surficial geology at the facility. At the southern end of the facility (the location of Basin 1 and Basin 2), the shales are overlain by Quaternary alluvium (*Geology of Penrith 1:100,000 Geological Sheet,* New South Whales Geological Survey) (Clark and Jones 1991) (Figure 2.1).

The Quaternary alluvium is associated with Prospect Creek and its tributaries. Alluvial deposits are generally thin, discontinuous (except along Prospect Creek) and relatively permeable. Where present at the facility, the alluvium mainly comprises clay.

The Wianamatta Group shales can be up to 300 m thick in Western Sydney, though 100 - 150 m is more typical (McNally 2004). The shales are made up of siltstone, mudstone, laminate, claystone and sandstone beds. Cuttings produced during the drilling of the groundwater monitoring bores at the facility indicate that the Bringelly Shale in the locality is mainly composed of shale, with up to 10% fine grained siltstone.

2.2 Hydrogeology

The facility is located within the area covered by the Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources – Sydney Central Basin Porous Rock Groundwater Source.

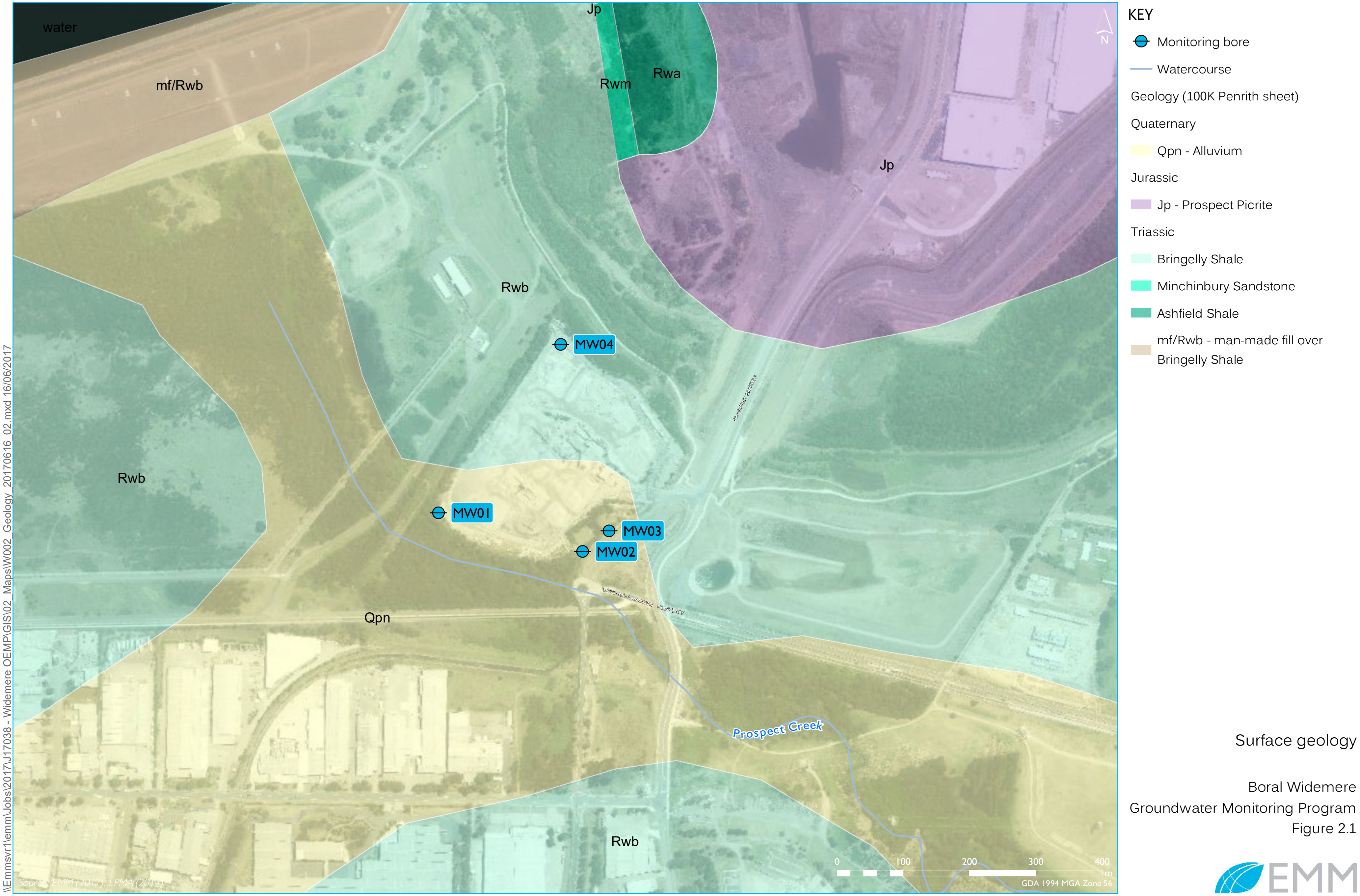
The Quaternary alluvial sediments associated with the surface water courses form unconfined groundwater systems of varying storage. These systems are responsive to rainfall and stream flow and form a minor beneficial groundwater system. The alluvial systems are depleted during dry periods and are not recharged by underlying rocks. These systems are isolated and have limited connection to the regional flow system.

The Bringelly Shale is generally of moderate to low permeability, with hydraulic conductivity values calculated from test data for the monitoring bores installed at the facility ranging from 4.5 x 10^{-4} m/day to 1.2 x 10^{-3} m/day (typical of weathered shale). The Bringelly Shale at the facility is low yielding. Water is typically brackish to saline, due to the marine depositional environment of the shales (Old 1942), with salinities ranging from 2,772 µS/cm to 10,004 µS/cm at the facility.

Regional groundwater levels are expected to be governed by the dip of the strata and topography.

2.3 Surface hydrology

The facility is located in the Prospect Creek Catchment. Prospect Creek is an urban water course of the Georges River Catchment. Prospect Creek's channel and riparian zone have been highly modified, with reaches of concrete channel established. Due to these significant modifications to the catchment and water course, Prospect Creek is considered to be a highly disturbed watercourse.



Source: EMM (2017); LPMA (2014)

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Surface geology

Boral Widemere
Groundwater Monitoring Program
Figure 2.1

2.4 Conceptual hydrogeological model

Groundwater flow within the Bringelly Shale is thought to be minimal due to the low primary permeability and is generally limited to perched groundwater systems (McNally 2004).

Groundwater flow within the shallow alluvium is largely thought to discharge to Prospect Creek, which forms the main drainage systems in the vicinity of the facility. Direct rainfall and surface runoff recharges this shallow system during wet periods which rapidly deplete during the drier periods providing an important source of baseflow for the surface watercourses (Section 5.1.2).

Vertical gradients provide an indication of the potential for groundwater to flow vertically upward or downward at that particular location. Groundwater levels are comparable in the alluvium and the shale at the facility indicating likely no vertical gradient between these monitored zones.

3 Groundwater monitoring network

The objectives of the groundwater monitoring network are to assess the potential for leakage of the sediment basins to groundwater and to gather baseline data to characterise the groundwater systems that the recycling facility potentially impacts upon (alluvium and Bringelly Shale).

The alluvium (clay) overlying the Bringelly Shale is monitored in the vicinity of the sediment basins, in order to detect any seepage from the basins to the groundwater. The sediment basins were upgraded from a clay liner to a HDPE liner in 2019, which was undertaken to minimise the permeability of the basins.

The monitoring network consists of a total of four monitoring bores (Figure 1.1), two deep monitoring bores targeting the uppermost water bearing zones within the Bringelly Shale and two shallow monitoring bores to assess potential seepage from the sediment basins. All monitoring bores were completed in January 2017. Details of the monitoring bores are listed in Table 3.1.

Table 3.1 Groundwater monitoring bores details

Monitoring bore	Total depth (m bgl)	Total depth (m AHD)	Screened interval (m bgl)	Screened interval (m AHD)	Screened lithology	Purpose
MW01	25.5	14.95	17.5 – 23.5	23.0 – 17.0	Bringelly Shale	Regional groundwater level monitoring
MW02	11.0	28.16	3.0 – 9.0	36.2 – 30.2	Alluvial clay	Sediment basins seepage monitoring
MW03	11.0	28.54	3.0 – 9.0	36.5 – 30.5	Alluvial clay	Sediment basins seepage monitoring
MW04	29.0	18.33	20.0 – 26.0	27.3 – 21.3	Bringelly Shale	Regional groundwater level monitoring

Notes: m bgl = meters below ground level, m AHD = meters Australian Height Datum.

4 Groundwater monitoring program

4.1 Water quality

Groundwater quality sampling was completed at a monthly frequency from all four bores between January and May 2017. Samples were also taken from Basin 2 in January and February 2017.

To obtain water quality samples, the following methods are used:

- a 12 V submersible pump is used to purge monitoring bores MW02 and MW03. A minimum of three bore volumes are removed prior to sampling to allow for a representative groundwater sample to be collected;
- a double-check bailer is used to sample MW01 and MW03. The monitoring bores purge dry after one bore volume is removed; a sample of the recharge water is then collected; and
- a telescopic sampler was used to collect water quality samples from Basin 2.

Water quality parameters were measured during and following purging to monitor water quality changes and to indicate groundwater representative of the formation suitable for sampling and analysis. Physicochemical parameters (pH, electrical conductivity, temperature, total dissolved solids, dissolved oxygen and oxidation reduction potential) are measured during and following purging using a calibrated hand-held water quality meter.

Water quality samples collected from the monitoring network were analysed for the suite of parameters listed in Table 4.1. During the February 2017 monitoring event, a more comprehensive suite of parameters was analysed, including volatile organic compounds, semi volatile organic compounds, solvents, pesticides and phthalates.

Table 4.1 Water quality suite of analysis

Grouping	Parameters	
Physicochemical parameters (field)	Electrical conductivity	Temperature
	pH	Total dissolved solids
	Dissolved oxygen	Oxidation reduction potential
Major ions	Calcium	Chloride
	Magnesium	Total alkalinity
	Sodium	Sulphate
	Potassium	Fluoride
Dissolved metals	Aluminium	Gallium
	Arsenic	Iron
	Beryllium	Lead
	Barium	Manganese
	Cadmium	Molybdenum
	Chromium (III + VI)	Nickel
	Chromium (VI)	Vanadium
	Cobalt	Zinc
	Copper	Mercury
Nutrients	Ammonia	Total Kjeldahl nitrogen
	Nitrate	Total nitrogen
	Nitrite	Total phosphorus
	Nitrite + Nitrate	Reactive phosphorus

Table 4.1 Water quality suite of analysis

Grouping	Parameters	
Hydrocarbons	Total Petroleum Hydrocarbons (TPH) Total Recoverable Hydrocarbons (TRH)	Benzene, toluene, Ethylbenzene, xylenes, naphthalene (BTEXN) Polynuclear Aromatic Hydrocarbons (PAH)

Samples requiring laboratory analysis are analysed by Australian Laboratory Services (ALS) in Smithfield, a NATA accredited laboratory.

4.1.1 Quality assurance and quality control (QA/QC)

i Field QA/QC

Field sampling procedures conform to EMM's QA/QC protocols to prevent cross-contamination and preserve sample integrity. The following QA/QC procedures are applied:

- samples are collected in clearly labelled bottles with appropriate preservation solutions;
- samples are delivered to the laboratory under chain-of-custody within the specified holding times (except for pH); and
- unstable parameters are analysed in the field (physiochemical parameters).

ii Laboratory QA/QC

The laboratory conducts its own internal QA/QC program to assess the repeatability of the analytical procedures and instrument accuracy. These programs include analysis of laboratory sample duplicates, spike samples, certified reference standards, surrogate standards/spikes and laboratory blanks. In addition, a duplicate sample is collected in the field for every ten samples collected to assess sampling and laboratory analysis accuracy.

4.2 Water levels

Following completion of the monitoring bores in January 2017, pressure transducers (dataloggers) were installed in the water column and programmed to record a groundwater level every six hours. Two dataloggers were installed in the sediment basins to record water levels every 15 minutes.

A barometric datalogger installed above the water table at monitoring bore MW04 records changes in atmospheric pressure. Data from this datalogger is used to correct for the effects of changing barometric pressure on water level loggers in the adjacent monitoring bores and basins.

To verify the levels recorded by the dataloggers, manual measurements are recorded during the monthly monitoring events using an electronic dip meter.

5 Baseline groundwater monitoring results to date

5.1 Water quality

Complete water quality results are presented in Appendix A. Laboratory certificates of analysis are presented in Appendix B.

Water quality results are compared against the ANZECC/ARMCANZ (2000) guidelines for freshwater ecosystems (south-east Australia – NSW lowland rivers) since rivers are believed to be the ultimate receiving waters for groundwater discharge. However, these water guidelines are often naturally exceeded in many catchments, and should not be considered as water quality objectives or thresholds.

Key findings for baseline groundwater monitoring results to date (May 2016) are:

- pH conditions in groundwater range from slightly acidic to neutral in the deeper shale monitoring bores (pH 6.22 at MW04 and pH 7.70 at MW01); and are near neutral to alkaline in the shallow clay seepage monitoring bores (pH 6.81 at MW02 and pH 8.30 at MW03). pH conditions in Basin 2 are alkaline (pH 7.52 to pH 8.33); the ANZECC/ARMCANZ (2000) guideline value (NSW lowland river ecosystems) was exceeded at MW04 and at Basin 2 in January 2017;

- salinity ranges from fresh in the clay monitoring bores (562 µS/cm at MW02 and 984 µS/cm at MW03), Basin 2 (384 µS/cm to 491 µS/cm) to slightly saline in the shale monitoring bores (2,670 µS/cm at MW04 and 10,300 µS/cm at MW01); and exceeds the ANZECC/ARMCANZ (2000) guideline value (NSW lowland river ecosystems) in the shale;

- groundwater in the clay monitoring bores (MW02 and MW03) is dominated by sodium and bicarbonate (Na-HCO3 type); groundwater in the shale monitoring bores (MW01 and MW04) is dominated by sodium and chloride (Na-Cl type); and water at Basin 2 is dominated by sodium with moderate bicarbonate;

- dissolved metals are generally present in groundwater and in the sediment basins at concentrations below the ANZECC/ARMCANZ (2000) guidelines, with the exception of minor exceedances of aluminium and copper in the clay monitoring bores; exceedances of manganese in shale monitoring bore MW01 and exceedances aluminium and copper in the sediment basin;

- no hexavalent chromium (Cr-VI) was detected in groundwater or in the sediment basin;

- nutrient concentrations generally exceed the ANZECC/ARMCANZ (2000) guidelines for ammonia at MW02, total nitrogen and total phosphorus concentrations at most monitoring bores, with concentrations generally the highest in the clay monitoring bores; and

- concentrations of polynuclear aromatic hydrocarbons (PAH), total recoverable hydrocarbons (TRH), total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene, total xylenes and naphthalene (BTEXN) are below the laboratory limit of reporting (LOR), with the exception of one detection of TRH (C10 – C36) and TPH (C10 – C40) at MW02 in February 2017.

5.2 Groundwater levels

Hydrographs showing groundwater levels and rainfall (recorded at the Prospect Reservoir Bureau of Meteorology weather station (67019)) from the start of monitoring until 30 May 2017 are presented in Figure 5.1.

The monitoring period was relatively dry, with the exception of March 2017 where a number of rainfall events exceeded 25 mm/day.

Groundwater levels in the alluvial clay monitoring bores (MW02 and MW03) are shallow (less than 10 m below ground level (m bgl)) and show a direct response to the February and March 2017 rainfall events, with monitoring bore MW03 showing a greater response.

Groundwater levels in Bringelly Shale monitoring bores (MW01 and MW04) are slightly deeper (10 m bgl to 15 m bgl) than the alluvial monitoring bores. Groundwater levels in the shale monitoring bores are comparable and show a muted response to the February and March 2017 rainfall events.

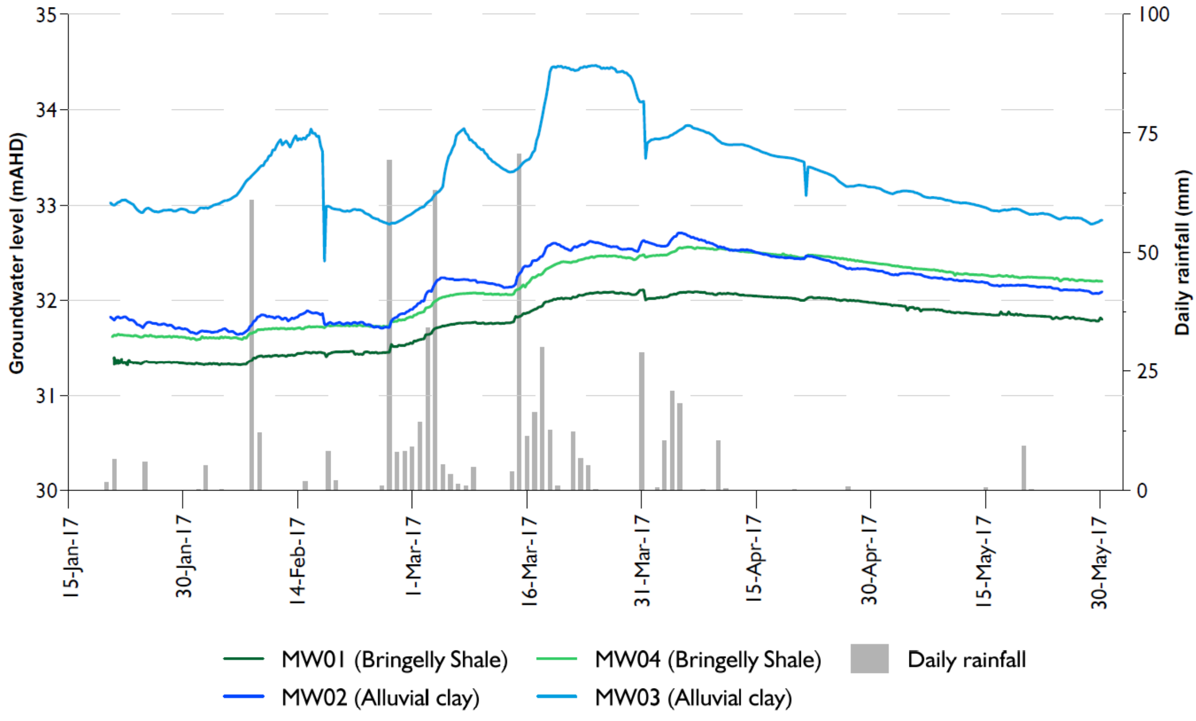

Figure 5.1 Groundwater monitoring bore hydrographs

Based on the available data, it is not possible to define groundwater – surface water interaction as no information is available on Prospect Creek's water level at the facility.

The conceptual model and the project specific data suggests that groundwater flow in the alluvial clay is towards Prospect Creek (ie westerly direction at the facility) and groundwater flow in the Bringelly Shale is minimal, with a slight westerly flow likely at the facility.

Groundwater levels are overall comparable in the alluvial clay and the Bringelly Shale, indicating no vertical gradient between these monitored zones. This is likely as the monitored formations are of relatively low permeability.

5.3 Seepage assessment

The potential for leakage from the sediment basins to groundwater was assessed in investigations completed on behalf of Boral between January and April 2017. In summary:

- the water quality results indicated weak chemical similarities between water quality samples collected at the sediment basins and in the seepage monitoring bores (EMM 2017 a and 2017b); and
- the water levels in the sediment basins were found to be higher than groundwater levels in the seepage monitoring bores, likely indicating a confined system (ie likely negligible leakage from the dams into the local groundwater system) (RoyalHaskoning DHV 2017).

Based on the available data, the potential for leakage into the groundwater system was assessed to be negligible (ie not detected in the seepage monitoring bores). However, the potential for leakage will be reassessed when more data becomes available. It is noted that the former clay liner for Sediments basins 1 and 2 was replaced with a HDPE liner in 2019 in order to reduce the permeability of the basins and the likelihood of any migration of potential contaminants into the underlying groundwater system.

6 Recommendations for ongoing monitoring

6.1 Baseline monitoring

It is recommended that baseline groundwater monitoring frequency is reduced to quarterly from June 2017 until the commencement of the expanded operations, as the results to date indicate small variations between monthly monitoring events. Quarterly monitoring will however allow for seasonality to be recorded in the baseline data.

Baseline monitoring to date has shown that some parameters exceed the default ANZECC/ARMCANZ (2000) guidelines for freshwater ecosystems (south-east Australia – NSW lowland rivers). This is an expected result given the highly disturbed nature of the catchment. Therefore, it is recommended that prior to the commencement of the expanded operations, site specific trigger values will be established in consultation with relevant government authorities (e.g. EPA). As recommended by the ANZECC/ARMCANZ (2000) guidelines, the site specific trigger values will be developed calculating the 80th percentile values (and the 20th percentile values where applicable). The 80th percentile is therefore the value below which 80% of observations are found. Using these percentiles removes anomalous data that is outside of the normal range (defined here as 0 – 80 % of values).

6.2 Expanded operations monitoring

Once the expanded operations commence, groundwater monitoring frequency is recommended to be increased to monthly for a period of six months. After these six months, the data collected will be analysed and interpreted to advise ongoing monitoring.

The recommended frequency of water quality sampling at the four monitoring bores and at Basin 2 is outlined in Table 6.1.

Table 6.1 Groundwater quality monitoring program

Monitoring phase	**Monitoring frequency**	
	Monitoring bores	***Sediment Basin 2***
Baseline		
January – June 2017	Monthly	January and February 2017
Expanded operations		
Six months from start of expanded operations	Monthly	Monthly
After six months from start of expanded operations	tbc[1]	tbc[1]

Note: 1. tbc = to be confirmed following review of monitoring data after six months of monitoring.

The ongoing monitoring will be used to identify potential leakage from the sediment basins into the groundwater and to inform appropriate management and mitigation responses.

It is proposed that a management response will be triggered if exceedances of any of the site specific trigger values occurs as described in the response action plan presented in Figure 6.1.

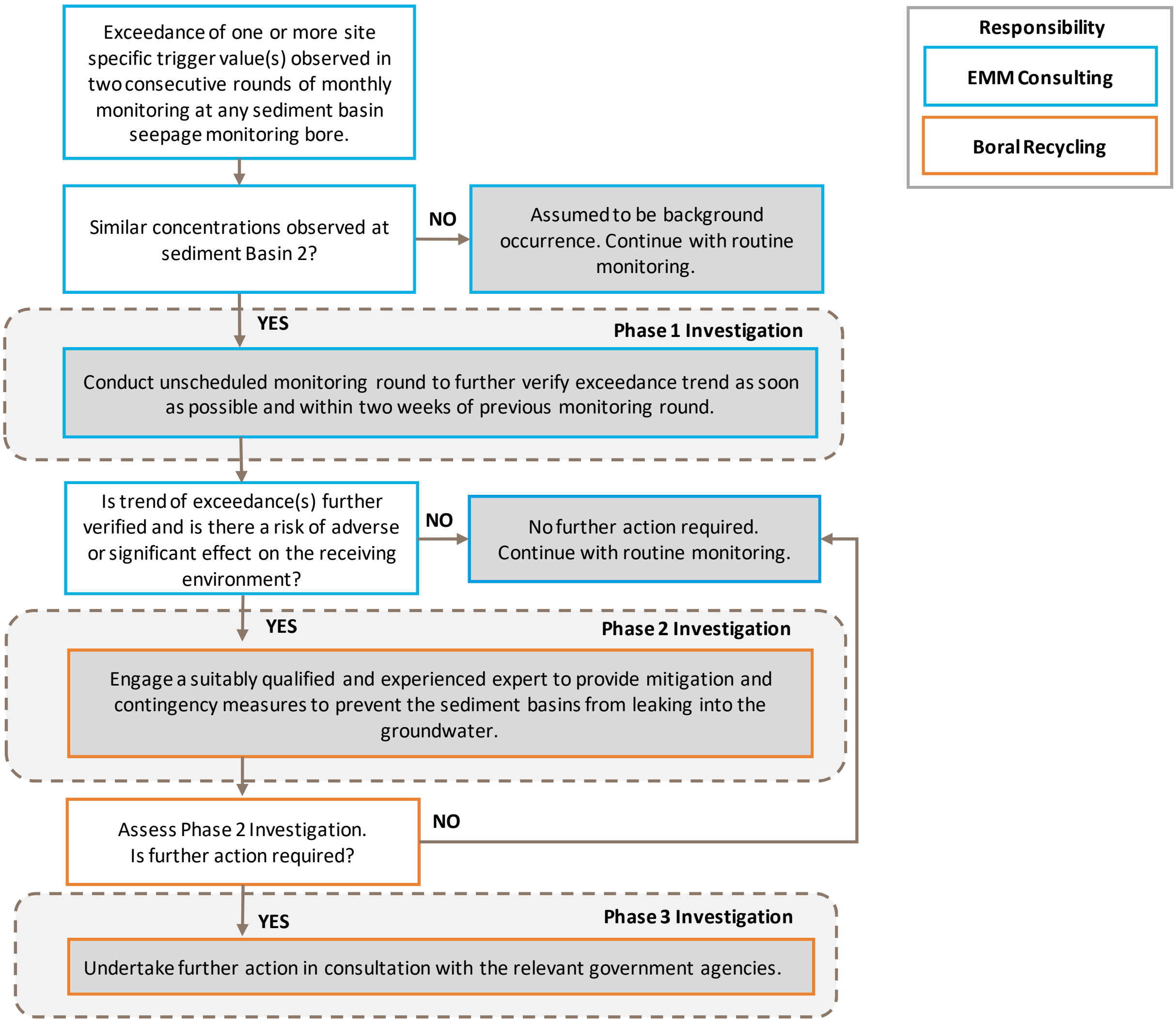

Figure 6.1 Response action process for exceedance of site specific trigger values

7 Reporting and review

Within three months of completion of six months of initial monitoring during expanded operations (Table 6.1), a groundwater monitoring report will be prepared in accordance with Condition C38 of the facility's current development approval. A copy of the groundwater monitoring report will be submitted to the Secretary and the EPA.

The groundwater monitoring report will include analysis and interpretation of groundwater quality, groundwater level and sediment basins data collected since monitoring began at all monitoring sites.

The groundwater monitoring report will also include a review of the monitoring network design and provide recommendations for ongoing monitoring, assess the adequacy of the monitoring network design, and assess whether additional monitoring bores are required.

References

Clark, NR and Jones DC 1991, *Penrith 1:100,000 Geological Sheet 9030.* New South Wales Geological Survey, Sydney.

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EMM 2017b, *Boral Widemere Recycling Facility – February 2017 Water Monitoring Results*, dated 31 March 2017.

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Old, AN 1942, 'The Wianamatta Shale Waters of the Sydney District', Agricultural Gazette of New South Wales, Misc. pub. No. 3225.

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Appendix A

Baseline water quality results (January - May 2017)

Appendix A. Baseline water quality results (January - May 2017)

	Units	EQL	ANZECC 2000 FW 95% (extreme hardness)	MW01				
				20/01/2017	17/02/2017	31/03/2017	21/04/2017	30/05/2017
Field								
Electrical conductivity (field)	uS/cm		125-2200	3,264	6,851	9,308	8,382	10,000
Electrical conductivity (lab)	µS/cm	1	125-2200	7,170	7,900	9,280	8,910	10,300
Dissolved oxygen (field)	%			31.1	8.7	11.8	55.3	46.3
	mg/L			2.65	0.71	1.03	4.71	4.13
pH (field)	pH units		6.5-8.0	7.36	6.9	7.27	7.7	7.11
Redox	mV			-82.8	-76.3	-48.6	-6.5	13.3
Temp (field)	°C			22.8	27.6	20.5	21.7	19
Suspended solids	mg/L	5		205	168,000	2,270	1,720	20,800
Total dissolved solids (field)	mg/L			-	4,450	6,051	5,447	6,506
Total dissolved solids (lab)	mg/L	10		4,550	6,660	6,110	4,820	5,760
Laboratory analytes								
Alkalinity (Hydroxide) as CaCO3	mg/L	1		<1	<1	<1	<1	<1
Alkalinity (total) as CaCO3	mg/L	1		385	434	526	439	497
Bicarbonate Alkalinity-mg CaCO3/L	mg/L	1		385	434	526	439	497
Carbonate Alkalinity-mg CaCO3/L	mg/L	1		<1	<1	<1	<1	<1
Chloride	mg/L	1		1,740	2,480	2,890	2,870	3,340
Calcium	mg/L	1		177	159	218	190	222
Fluoride	mg/L	0.01		0.641	0.8	0.6	0.6	0.7
Magnesium	mg/L	1		260	337	404	318	423
Potassium	mg/L	1		8	9	8	8	7
Sulfate as SO4 - Turbidimetric	mg/L	1		36	26	30	31	28
Sodium	mg/L	1		857	989	1,070	871	1,110
Dissolved metals								
Aluminium	mg/L	0.01	0.055	0.03	<0.01	0.03	<0.01	<0.01
Arsenic	mg/L	0.001		0.003	0.002	0.001	0.002	0.002
Barium	mg/L	0.001		0.916	0.986	1.18	0.931	1.29
Beryllium	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	0.0001	0.002	<0.0001	<0.0001	0.0002	<0.0001	<0.0001
Chromium	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (hexavalent)	µg/L	10	1	-	<10	<10	<10	<10
Cobalt	mg/L	0.001		-	0.004	0.007	0.003	0.009
Copper	mg/L	0.001	0.0126	0.003	<0.001	<0.001	<0.001	<0.001
Gallium	µg/L	1		-	<1	<1	<1	<1
Lead	mg/L	0.001	0.091	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	mg/L	0.001	1.9	0.847	0.863	1.53	0.637	2.16
Mercury	mg/L	0.0001	0.0006	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L	0.001		0.016	0.006	0.005	0.006	0.013
Nickel	mg/L	0.001	0.099	0.007	0.003	0.006	0.01	0.008
Vanadium	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	0.072	0.011	<0.005	<0.005	<0.005	0.005
Nutrients								
Ammonia (as N)	mg/L	0.01	0.9	0.24	0.58	0.55	0.56	0.37
Nitrite (as N)	mg/L	0.01		<0.01	<0.01	0.01	<0.01	0.01
Nitrate (as N)	mg/L	0.01		<0.01	0.04	<0.01	0.04	<0.01
Nitrogen (Total)	mg/L	0.1	0.35	0.3	7.6	1.1	0.8	14.6
Nitrite+Nitrate as N	mg/L	0.01		<0.01	0.04	<0.01	-	0.01
Kjeldahl Nitrogen Total	µg/L	100		300	7,600	1,100	800	14,600
Reactive phosphorus (as P)	mg/L	0.01		<0.01	<0.01	0.13	0.06	<0.01
Total phosphorus	mg/L	0.01	0.025	0.05	4.37	0.87	0.34	6.88
Aromatic hydrocarbons								
Benzene	µg/L	1	950	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	2		<2	<2	<2	<2	<2
Naphthalene	µg/L	1	16	<1	<1	<1	<1	<1
Toluene	µg/L	2		<2	<2	<2	<2	<2
Total BTEX	µg/L	1		<1	<1	<1	<1	<1
Xylene (m & p)	µg/L	2		<2	<2	<2	<2	<2
Xylene (o)	µg/L	2	350	<2	<2	<2	<2	<2
Xylene Total	µg/L	2		<2	<2	<2	<2	<2
Total petroleum hydrocarbons								
C 6 - C 9 Fraction	µg/L	20		<20	<20	<20	<20	<20
C10 - C14 Fraction	µg/L	50		<50	<50	<50	<50	<50
C15 - C28 Fraction	µg/L	100		<100	<100	<100	<100	<100
C29 - C36 Fraction	µg/L	50		<50	<50	<50	<50	<50
TPH+C10 - C36 (Sum of total)	µg/L	50		<50	<50	<50	<50	<50
Total recoverable hydrocarbons								
C6-C10 fraction	µg/L	20		<20	<20	<20	<20	<20
C6 - C10 fraction minus BTEX	µg/L	20		<20	<20	<20	<20	<20
C10 - C16 fraction	µg/L	100		<100	<100	<100	<100	<100
C16 - C34 fraction	µg/L	100		<100	<100	<100	<100	<100
C34 - C40 fraction	µg/L	100		<100	<100	<100	<100	<100
C10 - C40 fraction (Sum)	µg/L	100		<100	<100	<100	<100	<100
TRH >C10-C16 less Naphthalene (F2)	µg/L	100		<100	<100	<100	<100	<100
Polycyclic aromatic hydrocarb								
Acenaphthene	µg/L	1		<1	<1	<1	<1	<1
Acenaphthylene	µg/L	1		<1	<1	<1	<1	<1
Anthracene	µg/L	1		<1	<1	<1	<1	<1
Benz(a)anthracene	µg/L	1		<1	<1	<1	<1	<1
Benzo(k)fluoranthene	µg/L	1		<1	<1	<1	<1	<1
Benzo(b&j)fluoranthene	µg/L	1		<1	<1	<1	<1	<1
Benzo(a) pyrene	µg/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc (Zero)	µg/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	µg/L	1		<1	<1	<1	<1	<1
Chrysene	µg/L	1		<1	<1	<1	<1	<1
Dibenz(a,h)anthracene	µg/L	1		<1	<1	<1	<1	<1
Fluorene	µg/L	1		<1	<1	<1	<1	<1
Fluoranthene	µg/L	1		<1	<1	<1	<1	<1
Indeno(1,2,3-c,d)pyrene	µg/L	1		<1	<1	<1	<1	<1
Phenanthrene	µg/L	1		<1	<1	<1	<1	<1
Polycylic aromatic hydrocarbons EPA448	ug/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	µg/L	1		<1	<1	<1	<1	<1
Ionic balance								
Anions Total	meq/L	0.01		57.5	79.2	92.6	90.4	105
Cations Total	meq/L	0.01		67.7	78.9	90.9	73.7	94.4
Ionic Balance	%	0.01		8.14	0.16	0.97	10.1	5.21

Appendix A. Baseline water quality results (January - May 2017)

	Units	EQL	ANZECC 2000 FW 95% (extreme hardness)	MW02				
				19/01/2017	17/02/2017	31/03/2017	21/04/2017	30/05/2017
Field								
Electrical conductivity (field)	uS/cm		125-2200	624	562	719	641	588
Electrical conductivity (lab)	µS/cm	1	125-2200	602	580	705	618	535
Dissolved oxygen (field)	%			34.1	23.8	11.4	5.1	11.5
	mg/L			3.14	2.1	1.04	0.47	1.1
pH (field)	pH units		6.5-8.0	7.93	6.81	7.72	7.45	7.83
Redox	mV			-96.1	-68.9	-47	-11.7	-94.2
Temp (field)	°C			19	21	19.5	18.6	17.8
Suspended solids	mg/L	5		2,270	20,300	6,090	472	1,030
Total dissolved solids (field)	mg/L			-	364	468	416	383
Total dissolved solids (lab)	mg/L	10		667	1,060	620	458	819
Laboratory analytes								
Alkalinity (Hydroxide) as CaCO3	mg/L	1		<1	<1	<1	<1	<1
Alkalinity (total) as CaCO3	mg/L	1		228	227	242	200	179
Bicarbonate Alkalinity-mg CaCO3/L	mg/L	1		213	227	242	200	179
Carbonate Alkalinity-mg CaCO3/L	mg/L	1		15	<1	<1	<1	<1
Chloride	mg/L	1		46	40	46	43	37
Calcium	mg/L	1		18	17	29	23	18
Fluoride	mg/L	0.01		0.577	0.7	0.7	0.7	0.6
Magnesium	mg/L	1		21	17	29	22	17
Potassium	mg/L	1		<1	1	3	2	2
Sulfate as SO4 - Turbidimetric	mg/L	1		29	11	54	43	32
Sodium	mg/L	1		85	88	90	74	68
Dissolved metals								
Aluminium	mg/L	0.01	0.055	<0.01	0.17	<0.01	<0.01	<0.01
Arsenic	mg/L	0.001		0.001	<0.001	<0.001	<0.001	<0.001
Barium	mg/L	0.001		0.028	0.032	0.056	0.039	0.035
Beryllium	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	0.0001	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (hexavalent)	µg/L	10	1	-	<10	<10	<10	<10
Cobalt	mg/L	0.001		-	0.002	<0.001	<0.001	0.001
Copper	mg/L	0.001	0.0126	0.001	0.003	<0.001	<0.001	<0.001
Gallium	µg/L	1		-	<1	<1	<1	<1
Lead	mg/L	0.001	0.091	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	mg/L	0.001	1.9	0.1	0.232	0.286	0.222	0.218
Mercury	mg/L	0.0001	0.0006	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L	0.001		0.02	0.012	0.01	0.008	0.011
Nickel	mg/L	0.001	0.099	0.003	0.005	0.002	0.003	0.004
Vanadium	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	0.072	<0.005	<0.005	<0.005	<0.005	<0.005
Nutrients								
Ammonia (as N)	mg/L	0.01	0.9	0.4	1.27	2.64	1.67	1.54
Nitrite (as N)	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (as N)	mg/L	0.01		<0.01	0.02	<0.01	0.02	<0.01
Nitrogen (Total)	mg/L	0.1	0.35	0.8	10	8.1	2	3
Nitrite+Nitrate as N	mg/L	0.01		<0.01	0.02	<0.01	-	<0.01
Kjeldahl Nitrogen Total	µg/L	100		800	10,000	8,100	2,000	3,000
Reactive phosphorus (as P)	mg/L	0.01		0.04	0.12	0.15	0.1	0.12
Total phosphorus	mg/L	0.01	0.025	3.28	5.39	4.83	1.02	1.05
Aromatic hydrocarbons								
Benzene	µg/L	1	950	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	2		<2	<2	<2	<2	<2
Naphthalene	µg/L	1	16	<1	<1	<1	<1	<1
Toluene	µg/L	2		<2	<2	<2	<2	<2
Total BTEX	µg/L	1		<1	<1	<1	<1	<1
Xylene (m & p)	µg/L	2		<2	<2	<2	<2	<2
Xylene (o)	µg/L	2	350	<2	<2	<2	<2	<2
Xylene Total	µg/L	2		<2	<2	<2	<2	<2
Total petroleum hydrocarbons								
C 6 - C 9 Fraction	µg/L	20		<20	<20	<20	<20	<20
C10 - C14 Fraction	µg/L	50		<50	<50	<50	<50	<50
C15 - C28 Fraction	µg/L	100		<100	560	<100	<100	<100
C29 - C36 Fraction	µg/L	50		<50	230	<50	<50	<50
TPH+C10 - C36 (Sum of total)	µg/L	50		<50	790	<50	<50	<50
Total recoverable hydrocarbons								
C6-C10 fraction	µg/L	20		<20	<20	<20	<20	<20
C6 - C10 fraction minus BTEX	µg/L	20		<20	<20	<20	<20	<20
C10 - C16 fraction	µg/L	100		<100	<100	<100	<100	<100
C16 - C34 fraction	µg/L	100		<100	700	<100	<100	<100
C34 - C40 fraction	µg/L	100		<100	100	<100	<100	<100
C10 - C40 fraction (Sum)	µg/L	100		<100	800	<100	<100	<100
TRH >C10-C16 less Naphthalene (F2)	µg/L	100		<100	<100	<100	<100	<100
Polycyclic aromatic hydrocarb								
Acenaphthene	µg/L	1		<1	<1	<1	<1	<1
Acenaphthylene	µg/L	1		<1	<1	<1	<1	<1
Anthracene	µg/L	1		<1	<1	<1	<1	<1
Benz(a)anthracene	µg/L	1		<1	<1	<1	<1	<1
Benzo(k)fluoranthene	µg/L	1		<1	<1	<1	<1	<1
Benzo(b&j)fluoranthene	µg/L	1		<1	<1	<1	<1	<1
Benzo(a) pyrene	µg/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc (Zero)	µg/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	µg/L	1		<1	<1	<1	<1	<1
Chrysene	µg/L	1		<1	<1	<1	<1	<1
Dibenz(a,h)anthracene	µg/L	1		<1	<1	<1	<1	<1
Fluorene	µg/L	1		<1	<1	<1	<1	<1
Fluoranthene	µg/L	1		<1	<1	<1	<1	<1
Indeno(1,2,3-c,d)pyrene	µg/L	1		<1	<1	<1	<1	<1
Phenanthrene	µg/L	1		<1	<1	<1	<1	<1
Polycylic aromatic hydrocarbons EPA448	ug/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	µg/L	1		<1	<1	<1	<1	<1
Ionic balance								
Anions Total	meq/L	0.01		6.46	5.89	7.26	6.1	5.29
Cations Total	meq/L	0.01		6.32	6.1	7.82	6.23	5.31
Ionic Balance	%	0.01		1.04	1.73	3.77	1.01	0.19

Appendix A. Baseline water quality results (January - May 2017)

	Units	EQL	ANZECC 2000 FW 95% (extreme hardness)	MW03				
				20/01/2017	17/02/2017	31/03/2017	21/04/2017	30/05/2017
Field								
Electrical conductivity (field)	uS/cm		125-2200	827	7.08	927	1,025	1,027
Electrical conductivity (lab)	µS/cm	1	125-2200	715	732	883	984	974
Dissolved oxygen (field)	%			50	70.3	20.8	49.3	64.8
	mg/L			4.51	5.47	1.88	4.38	6.1
pH (field)	pH units		6.5-8.0	8.3	7.12	7.46	7.38	7.45
Redox	mV			84.8	-83.2	107	30.4	-0.6
Temp (field)	°C			20.6	28.1	20.1	21	18.2
Suspended solids	mg/L	5		14,800	20,600	6,150	1,470	7,120
Total dissolved solids (field)	mg/L			-	462	604	669	668
Total dissolved solids (lab)	mg/L	10		875	2,070	892	710	801
Laboratory analytes								
Alkalinity (Hydroxide) as CaCO3	mg/L	1		<1	<1	<1	<1	<1
Alkalinity (total) as CaCO3	mg/L	1		263	242	247	236	263
Bicarbonate Alkalinity-mg CaCO3/L	mg/L	1		242	242	247	236	263
Carbonate Alkalinity-mg CaCO3/L	mg/L	1		20	<1	<1	<1	<1
Chloride	mg/L	1		52	46	64	76	68
Calcium	mg/L	1		27	36	48	53	48
Fluoride	mg/L	0.01		0.514	0.6	0.6	0.5	0.4
Magnesium	mg/L	1		35	27	42	43	44
Potassium	mg/L	1		1	1	2	2	1
Sulfate as SO4 - Turbidimetric	mg/L	1		40	57	115	163	154
Sodium	mg/L	1		73	77	94	85	94
Dissolved metals								
Aluminium	mg/L	0.01	0.055	0.01	0.02	0.05	<0.01	0.07
Arsenic	mg/L	0.001		<0.001	<0.001	<0.001	0.001	<0.001
Barium	mg/L	0.001		0.031	0.054	0.034	0.047	0.039
Beryllium	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	0.0001	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (hexavalent)	µg/L	10	1	-	<10	<10	<10	<10
Cobalt	mg/L	0.001		-	<0.001	<0.001	<0.001	<0.001
Copper	mg/L	0.001	0.0126	0.005	0.004	0.014	0.057	0.076
Gallium	µg/L	1		-	<1	<1	<1	<1
Lead	mg/L	0.001	0.091	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	mg/L	0.001	1.9	0.417	0.005	0.344	0.077	0.05
Mercury	mg/L	0.0001	0.0006	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L	0.001		0.015	0.018	0.017	0.01	0.013
Nickel	mg/L	0.001	0.099	0.006	0.002	0.003	0.003	0.002
Vanadium	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	0.072	<0.005	<0.005	<0.005	<0.005	<0.005
Nutrients								
Ammonia (as N)	mg/L	0.01	0.9	0.36	0.07	0.22	0.01	0.02
Nitrite (as N)	mg/L	0.01		<0.01	<0.01	0.04	<0.01	<0.01
Nitrate (as N)	mg/L	0.01		<0.01	0.14	0.04	0.22	0.01
Nitrogen (Total)	mg/L	0.1	0.35	2.3	14.3	2.7	1	7.2
Nitrite+Nitrate as N	mg/L	0.01		<0.01	0.14	0.08	-	0.01
Kjeldahl Nitrogen Total	µg/L	100		2,300	14,200	2,600	800	7,200
Reactive phosphorus (as P)	mg/L	0.01		<0.01	<0.01	0.04	<0.01	<0.01
Total phosphorus	mg/L	0.01	0.025	2.4	12.8	2.49	0.73	8.17
Aromatic hydrocarbons								
Benzene	µg/L	1	950	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	2		<2	<2	<2	<2	<2
Naphthalene	µg/L	1	16	<1	<1	<1	<1	<1
Toluene	µg/L	2		<2	<2	<2	<2	<2
Total BTEX	µg/L	1		<1	<1	<1	<1	<1
Xylene (m & p)	µg/L	2		<2	<2	<2	<2	<2
Xylene (o)	µg/L	2	350	<2	<2	<2	<2	<2
Xylene Total	µg/L	2		<2	<2	<2	<2	<2
Total petroleum hydrocarbons								
C 6 - C 9 Fraction	µg/L	20		<20	<20	<20	<20	<20
C10 - C14 Fraction	µg/L	50		<50	<50	<50	<50	<50
C15 - C28 Fraction	µg/L	100		<100	<100	<100	<100	<100
C29 - C36 Fraction	µg/L	50		<50	<50	<50	<50	<50
TPH+C10 - C36 (Sum of total)	µg/L	50		<50	<50	<50	<50	<50
Total recoverable hydrocarbons								
C6-C10 fraction	µg/L	20		<20	<20	<20	<20	<20
C6 - C10 fraction minus BTEX	µg/L	20		<20	<20	<20	<20	<20
C10 - C16 fraction	µg/L	100		<100	<100	<100	<100	<100
C16 - C34 fraction	µg/L	100		<100	110	<100	<100	<100
C34 - C40 fraction	µg/L	100		<100	<100	<100	<100	<100
C10 - C40 fraction (Sum)	µg/L	100		<100	110	<100	<100	<100
TRH >C10-C16 less Naphthalene (F2)	µg/L	100		<100	<100	<100	<100	<100
Polycyclic aromatic hydrocarb								
Acenaphthene	µg/L	1		<1	<1	<1	<1	<1
Acenaphthylene	µg/L	1		<1	<1	<1	<1	<1
Anthracene	µg/L	1		<1	<1	<1	<1	<1
Benz(a)anthracene	µg/L	1		<1	<1	<1	<1	<1
Benzo(k)fluoranthene	µg/L	1		<1	<1	<1	<1	<1
Benzo(b&j)fluoranthene	µg/L	1		<1	<1	<1	<1	<1
Benzo(a) pyrene	µg/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc (Zero)	µg/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	µg/L	1		<1	<1	<1	<1	<1
Chrysene	µg/L	1		<1	<1	<1	<1	<1
Dibenz(a,h)anthracene	µg/L	1		<1	<1	<1	<1	<1
Fluorene	µg/L	1		<1	<1	<1	<1	<1
Fluoranthene	µg/L	1		<1	<1	<1	<1	<1
Indeno(1,2,3-c,d)pyrene	µg/L	1		<1	<1	<1	<1	<1
Phenanthrene	µg/L	1		<1	<1	<1	<1	<1
Polycylic aromatic hydrocarbons EPA448	ug/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	µg/L	1		<1	<1	<1	<1	<1
Ionic balance								
Anions Total	meq/L	0.01		7.55	7.32	9.13	10.2	10.4
Cations Total	meq/L	0.01		7.43	7.39	9.99	9.93	10.1
Ionic Balance	%	0.01		0.84	0.5	4.48	1.59	1.21

Appendix A. Baseline water quality results (January - May 2017)

			ANZECC 2000 FW 95%	MW04				
	Units	EQL	(extreme hardness)	19/01/2017	17/02/2017	31/03/2017	21/04/2017	30/05/2017
Field								
Electrical conductivity (field)	uS/cm		125-2200	3,536	3,551	2,772	3,877	3,888
Electrical conductivity (lab)	µS/cm	1	125-2200	4,260	4,190	2,670	4,120	3,760
Dissolved oxygen (field)	%			17.2	11.8	13.1	5.2	7.2
	mg/L			1.51	1.04	1.22	0.47	0.68
pH (field)	pH units		6.5-8.0	6.92	6.22	6.74	6.78	6.74
Redox	mV			-105.5	-78.9	64	-25.2	-7.4
Temp (field)	°C			20.4	21.2	18.3	19.4	17.3
Suspended solids	mg/L	5		466	48	349	56	111
Total dissolved solids (field)	mg/L			-	2,307	1,801	2,522	2,528
Total dissolved solids (lab)	mg/L	10		2,950	2,680	1,450	2,480	2,650
Laboratory analytes								
Alkalinity (Hydroxide) as CaCO3	mg/L	1		<1	<1	<1	<1	<1
Alkalinity (total) as CaCO3	mg/L	1		485	692	733	579	615
Bicarbonate Alkalinity-mg CaCO3/L	mg/L	1		485	692	733	579	615
Carbonate Alkalinity-mg CaCO3/L	mg/L	1		<1	<1	<1	<1	<1
Chloride	mg/L	1		954	955	471	936	855
Calcium	mg/L	1		200	182	143	154	152
Fluoride	mg/L	0.01		0.264	0.1	0.2	0.2	0.2
Magnesium	mg/L	1		207	237	167	183	186
Potassium	mg/L	1		10	8	8	7	7
Sulfate as SO4 - Turbidimetric	mg/L	1		45	35	14	36	38
Sodium	mg/L	1		354	335	181	297	335
Dissolved metals								
Aluminium	mg/L	0.01	0.055	0.05	<0.01	<0.01	<0.01	<0.01
Arsenic	mg/L	0.001		0.014	0.012	0.003	0.008	0.008
Barium	mg/L	0.001		1.29	1.47	1.12	1.08	1.19
Beryllium	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	0.0001	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (hexavalent)	µg/L	10	1	-	<10	<10	<10	<10
Cobalt	mg/L	0.001		-	<0.001	<0.001	<0.001	<0.001
Copper	mg/L	0.001	0.0126	0.003	<0.001	<0.001	<0.001	<0.001
Gallium	µg/L	1		-	<1	<1	<1	<1
Lead	mg/L	0.001	0.091	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	mg/L	0.001	1.9	0.247	0.162	0.146	0.145	0.143
Mercury	mg/L	0.0001	0.0006	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L	0.001		0.006	0.002	0.001	0.002	0.001
Nickel	mg/L	0.001	0.099	0.011	<0.001	0.002	<0.001	<0.001
Vanadium	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	0.072	0.015	0.006	0.022	0.009	<0.005
Nutrients								
Ammonia (as N)	mg/L	0.01	0.9	0.28	0.26	0.22	0.24	0.24
Nitrite (as N)	mg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (as N)	mg/L	0.01		0.02	0.09	<0.01	0.03	<0.01
Nitrogen (Total)	mg/L	0.1	0.35	0.5	0.4	1.1	0.2	0.3
Nitrite+Nitrate as N	mg/L	0.01		0.02	0.09	<0.01	-	<0.01
Kjeldahl Nitrogen Total	µg/L	100		500	300	1,100	200	300
Reactive phosphorus (as P)	mg/L	0.01		<0.01	<0.01	0.12	<0.01	<0.01
Total phosphorus	mg/L	0.01	0.025	0.2	0.03	1.66	0.02	0.05
Aromatic hydrocarbons								
Benzene	µg/L	1	950	<1	<1	<1	1	<1
Ethylbenzene	µg/L	2		<2	<2	<2	<2	<2
Naphthalene	µg/L	1	16	<1	<1	<1	<1	<1
Toluene	µg/L	2		<2	<2	<2	<2	<2
Total BTEX	µg/L	1		<1	<1	<1	1	<1
Xylene (m & p)	µg/L	2		<2	<2	<2	<2	<2
Xylene (o)	µg/L	2	350	<2	<2	<2	<2	<2
Xylene Total	µg/L	2		<2	<2	<2	<2	<2
Total petroleum hydrocarbons								
C 6 - C 9 Fraction	µg/L	20		<20	<20	<20	<20	<20
C10 - C14 Fraction	µg/L	50		<50	<50	<50	<50	<50
C15 - C28 Fraction	µg/L	100		<100	<100	<100	<100	<100
C29 - C36 Fraction	µg/L	50		<50	<50	<50	<50	<50
TPH+C10 - C36 (Sum of total)	µg/L	50		<50	<50	<50	<50	<50
Total recoverable hydrocarbons								
C6-C10 fraction	µg/L	20		<20	<20	<20	<20	<20
C6 - C10 fraction minus BTEX	µg/L	20		<20	<20	<20	<20	<20
C10 - C16 fraction	µg/L	100		<100	<100	<100	<100	<100
C16 - C34 fraction	µg/L	100		<100	<100	<100	<100	<100
C34 - C40 fraction	µg/L	100		<100	<100	<100	<100	<100
C10 - C40 fraction (Sum)	µg/L	100		<100	<100	<100	<100	<100
TRH >C10-C16 less Naphthalene (F2)	µg/L	100		<100	<100	<100	<100	<100
Polycyclic aromatic hydrocarb								
Acenaphthene	µg/L	1		<1	<1	<1	<1	<1
Acenaphthylene	µg/L	1		<1	<1	<1	<1	<1
Anthracene	µg/L	1		<1	<1	<1	<1	<1
Benz(a)anthracene	µg/L	1		<1	<1	<1	<1	<1
Benzo(k)fluoranthene	µg/L	1		<1	<1	<1	<1	<1
Benzo(b&j)fluoranthene	µg/L	1		<1	<1	<1	<1	<1
Benzo(a) pyrene	µg/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc (Zero)	µg/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	µg/L	1		<1	<1	<1	<1	<1
Chrysene	µg/L	1		<1	<1	<1	<1	<1
Dibenz(a,h)anthracene	µg/L	1		<1	<1	<1	<1	<1
Fluorene	µg/L	1		<1	<1	<1	<1	<1
Fluoranthene	µg/L	1		<1	<1	<1	<1	<1
Indeno(1,2,3-c,d)pyrene	µg/L	1		<1	<1	<1	<1	<1
Phenanthrene	µg/L	1		<1	<1	<1	<1	<1
Polycylic aromatic hydrocarbons EPA448	ug/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	µg/L	1		<1	<1	<1	<1	<1
Ionic balance								
Anions Total	meq/L	0.01		37.5	41.5	28.2	38.7	37.2
Cations Total	meq/L	0.01		42.7	43.4	29	35.8	37.6
Ionic Balance	%	0.01		6.4	2.2	1.28	3.86	0.6

Appendix A. Baseline water quality results (January - May 2017)

	Units	EQL	ANZECC 2000 FW 95% (moderate hardness)	Basin 2	
				20/01/2017	17/02/2017
Field					
Electrical conductivity (field)	uS/cm		125-2200	566	383
Electrical conductivity (lab)	µS/cm	1	125-2200	491	384
Dissolved oxygen (field)	%			57.9	30.5
	mg/L			4.76	2.52
pH (field)	pH units		6.5-8	8.33	7.52
Redox	mV			-79.3	-86.9
Temp (field)	°C			25.2	24.3
Suspended solids	mg/L	5		64	202
Total dissolved solids (field)	mg/L			-	249
Total dissolved solids (lab)	mg/L	10		346	337
Laboratory analytes					
Alkalinity (Hydroxide) as CaCO3	mg/L	1		<1	<1
Alkalinity (total) as CaCO3	mg/L	1		82	62
Bicarbonate Alkalinity-mg CaCO3/L	mg/L	1		82	62
Carbonate Alkalinity-mg CaCO3/L	mg/L	1		<1	<1
Chloride	mg/L	1		44	33
Calcium	mg/L	1		25	24
Fluoride	mg/L	0.01		0.587	0.6
Magnesium	mg/L	1		3	2
Potassium	mg/L	1		26	15
Sulfate as SO4 - Turbidimetric	mg/L	1		67	54
Sodium	mg/L	1		56	34
Dissolved metals					
Aluminium	mg/L	0.01	0.055	0.12	0.14
Arsenic	mg/L	0.001		0.003	0.003
Barium	mg/L	0.001		0.014	0.011
Beryllium	mg/L	0.001		<0.001	<0.001
Cadmium	mg/L	0.0001	0.0005	<0.0001	<0.0001
Chromium	mg/L	0.001		0.004	0.001
Chromium (hexavalent)	µg/L	10	1	-	<10
Cobalt	mg/L	0.001		-	<0.001
Copper	mg/L	0.001	0.0035	0.006	0.002
Gallium	µg/L	1		-	<1
Lead	mg/L	0.001	0.014	<0.001	<0.001
Manganese	mg/L	0.001	1.9	<0.001	0.002
Mercury	mg/L	0.0001	0.0006	<0.0001	<0.0001
Molybdenum	mg/L	0.001		0.01	0.012
Nickel	mg/L	0.001	0.028	0.001	0.002
Vanadium	mg/L	0.01		0.02	0.06
Zinc	mg/L	0.005	0.02	<0.005	<0.005
Nutrients					
Ammonia (as N)	mg/L	0.01	0.9	0.13	0.69
Nitrite (as N)	mg/L	0.01		0.04	0.42
Nitrate (as N)	mg/L	0.01		0.53	0.3
Nitrogen (Total)	mg/L	0.1	0.35	1.3	2.5
Nitrite+Nitrate as N	mg/L	0.01		0.57	0.72
Kjeldahl Nitrogen Total	µg/L	100		700	1,800
Reactive phosphorus (as P)	mg/L	0.01		<0.01	<0.01
Total phosphorus	mg/L	0.01	0.025	0.02	0.2
Aromatic hydrocarbons					
Benzene	µg/L	1	950	<1	<1
Ethylbenzene	µg/L	2		<2	<2
Naphthalene	µg/L	1	16	<1	<1
Toluene	µg/L	2		<2	<2
Total BTEX	µg/L	1		<1	<1
Xylene (m & p)	µg/L	2		<2	<2
Xylene (o)	µg/L	2	350	<2	<2
Xylene Total	µg/L	2		<2	<2
Total petroleum hydrocarbons					
C 6 - C 9 Fraction	µg/L	20		<20	<20
C10 - C14 Fraction	µg/L	50		<50	<50
C15 - C28 Fraction	µg/L	100		<100	<100
C29 - C36 Fraction	µg/L	50		<50	<50
TPH+C10 - C36 (Sum of total)	µg/L	50		<50	<50
Total recoverable hydrocarbons					
C6-C10 fraction	µg/L	20		<20	<20
C6 - C10 fraction minus BTEX	µg/L	20		<20	<20
C10 - C16 fraction	µg/L	100		<100	<100
C16 - C34 fraction	µg/L	100		<100	<100
C34 - C40 fraction	µg/L	100		<100	<100
C10 - C40 fraction (Sum)	µg/L	100		<100	<100
TRH >C10-C16 less Naphthalene (F2)	µg/L	100		<100	<100
Polycyclic aromatic hydrocarb					
Acenaphthene	µg/L	1		<1	<1
Acenaphthylene	µg/L	1		<1	<1
Anthracene	µg/L	1		<1	<1
Benz(a)anthracene	µg/L	1		<1	<1
Benzo(k)fluoranthene	µg/L	1		<1	<1
Benzo(b&j)fluoranthene	µg/L	1		<1	<1
Benzo(a) pyrene	µg/L	0.5		<0.5	<0.5
Benzo(a)pyrene TEQ calc (Zero)	µg/L	0.5		<0.5	<0.5
Benzo(g,h,i)perylene	µg/L	1		<1	<1
Chrysene	µg/L	1		<1	<1
Dibenz(a,h)anthracene	µg/L	1		<1	<1
Fluorene	µg/L	1		<1	<1
Fluoranthene	µg/L	1		<1	<1
Indeno(1,2,3-c,d)pyrene	µg/L	1		<1	<1
Phenanthrene	µg/L	1		<1	<1
Polycylic aromatic hydrocarbons EPA448	ug/L	0.5		<0.5	<0.5
Pyrene	µg/L	1		<1	<1
Ionic balance					
Anions Total	meq/L	0.01		4.27	3.29
Cations Total	meq/L	0.01		4.6	3.22
Ionic Balance	%	0.01		3.62	1.06

Appendix B

Laboratory reports

CERTIFICATE OF ANALYSIS

Work Order	: **ES1701445**	Page	: 1 of 11
Amendment	: **2**		
Client	: **EMM CONSULTING PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS CAROLINA SARDELLA	Contact	: Customer Services ES
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Telephone	: +61 02 9493 9500	Telephone	: +61-2-8784 8555
Project	: J17004	Date Samples Received	: 20-Jan-2017 18:40
Order number	: ----	Date Analysis Commenced	: 21-Jan-2017
C-O-C number	: ----	Issue Date	: 20-Mar-2017 12:49
Sampler	: Sean Moran		
Site	: ----		
Quote number	: SYBQ/202/15		
No. of samples received	: 6		
No. of samples analysed	: 6		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Raymond Commodore	Instrument Chemist	Sydney Inorganics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- TDS by method EA-015 may bias high for various samples due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- Amendment (20/03/2017): This report has been amended as a result of a request to change sample identification numbers (IDs) received by ALS from Carolina on 20/3/17. All analysis results are as per the previous report.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

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

Compound	CAS Number	LOR	Unit	MW01	MW02	MW03	MW04	Basin 1 (Inflow)
Client sampling date / time				20-Jan-2017 10:00	19-Jan-2017 16:00	20-Jan-2017 10:30	19-Jan-2017 16:30	20-Jan-2017 12:45
				ES1701445-001	**ES1701445-002**	**ES1701445-003**	**ES1701445-004**	**ES1701445-005**
				Result	Result	Result	Result	Result
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**7170**	**602**	**715**	**4260**	**1030**
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	**4550**	**667**	**875**	**2950**	**570**
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**205**	**2270**	**14800**	**466**	**315**
ED009: Anions								
Fluoride	16984-48-8	0.01	mg/L	**0.641**	**0.577**	**0.514**	**0.264**	<0.010
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	**66**
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	**15**	**20**	<1	**65**
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**385**	**213**	**242**	**485**	<1
Total Alkalinity as CaCO3	----	1	mg/L	**385**	**228**	**263**	**485**	**130**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**36**	**29**	**40**	**45**	**156**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**1740**	**46**	**52**	**954**	**58**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**177**	**18**	**27**	**200**	**63**
Magnesium	7439-95-4	1	mg/L	**260**	**21**	**35**	**207**	<1
Sodium	7440-23-5	1	mg/L	**857**	**85**	**73**	**354**	**82**
Potassium	7440-09-7	1	mg/L	**8**	<1	**1**	**10**	**57**
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.03**	<0.01	**0.01**	**0.05**	**2.61**
Arsenic	7440-38-2	0.001	mg/L	**0.003**	**0.001**	<0.001	**0.014**	**0.002**
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	7440-39-3	0.001	mg/L	**0.916**	**0.028**	**0.031**	**1.29**	**0.017**
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	**0.036**
Copper	7440-50-8	0.001	mg/L	**0.003**	**0.001**	**0.005**	**0.003**	**0.024**
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	**0.847**	**0.100**	**0.417**	**0.247**	<0.001
Molybdenum	7439-98-7	0.001	mg/L	**0.016**	**0.020**	**0.015**	**0.006**	**0.022**
Nickel	7440-02-0	0.001	mg/L	**0.007**	**0.003**	**0.006**	**0.011**	**0.004**
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	**0.04**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 1 (Inflow)**
			Client sampling date / time	20-Jan-2017 10:00	19-Jan-2017 16:00	20-Jan-2017 10:30	19-Jan-2017 16:30	20-Jan-2017 12:45
Compound	*CAS Number*	*LOR*	*Unit*	**ES1701445-001**	**ES1701445-002**	**ES1701445-003**	**ES1701445-004**	**ES1701445-005**
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Zinc	7440-66-6	0.005	mg/L	**0.011**	<0.005	<0.005	**0.015**	<0.005
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.24**	**0.40**	**0.36**	**0.28**	**0.25**
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	**1.50**
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	**0.02**	**1.19**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	**0.02**	**2.69**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**0.3**	**0.8**	**2.3**	**0.5**	**1.6**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**0.3**	**0.8**	**2.3**	**0.5**	**4.3**
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.05**	**3.28**	**2.40**	**0.20**	**0.10**
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	**0.04**	<0.01	<0.01	<0.01
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	**57.5**	**6.46**	**7.55**	**37.5**	**7.48**
Total Cations	----	0.01	meq/L	**67.7**	**6.32**	**7.43**	**42.7**	**8.17**
Ionic Balance	----	0.01	%	**8.14**	**1.04**	**0.84**	**6.40**	**4.39**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 1 (Inflow)**
			Client sampling date / time	20-Jan-2017 10:00	19-Jan-2017 16:00	20-Jan-2017 10:30	19-Jan-2017 16:30	20-Jan-2017 12:45
Compound	*CAS Number*	*LOR*	*Unit*	**ES1701445-001**	**ES1701445-002**	**ES1701445-003**	**ES1701445-004**	**ES1701445-005**
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Chrysene	218-01-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	<100	<100	<100	<100
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	<100	<100	<100	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ **Total Xylenes**	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ **Sum of BTEX**	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 1 (Inflow)**
			Client sampling date / time	20-Jan-2017 10:00	19-Jan-2017 16:00	20-Jan-2017 10:30	19-Jan-2017 16:30	20-Jan-2017 12:45
Compound	CAS Number	LOR	Unit	**ES1701445-001**	**ES1701445-002**	**ES1701445-003**	**ES1701445-004**	**ES1701445-005**
				Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	**15.6**	**23.7**	**21.9**	**25.0**	**18.4**
2-Chlorophenol-D4	93951-73-6	1	%	**39.5**	**52.8**	**48.9**	**58.7**	**44.1**
2.4.6-Tribromophenol	118-79-6	1	%	**40.4**	**62.6**	**61.2**	**72.3**	**34.1**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	**48.3**	**73.4**	**69.0**	**75.6**	**87.7**
Anthracene-d10	1719-06-8	1	%	**56.6**	**79.8**	**55.4**	**61.9**	**67.3**
4-Terphenyl-d14	1718-51-0	1	%	**54.3**	**73.6**	**71.3**	**79.8**	**64.6**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**119**	**118**	**118**	**119**	**117**
Toluene-D8	2037-26-5	2	%	**118**	**117**	**120**	**116**	**121**
4-Bromofluorobenzene	460-00-4	2	%	**109**	**110**	**109**	**108**	**109**

Analytical Results

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

			Client sample ID	**Basin 2**	----	----	----	----
			Client sampling date / time	20-Jan-2017 13:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1701445-006**	--------	--------	--------	--------
				Result	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**491**	----	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	**346**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**64**	----	----	----	----
ED009: Anions								
Fluoride	16984-48-8	0.01	mg/L	**0.587**	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**82**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**82**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**67**	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**44**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**25**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	**3**	----	----	----	----
Sodium	7440-23-5	1	mg/L	**56**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**26**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.12**	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L	**0.003**	----	----	----	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	----	----	----	----
Barium	7440-39-3	0.001	mg/L	**0.014**	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	**0.004**	----	----	----	----
Copper	7440-50-8	0.001	mg/L	**0.006**	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Manganese	7439-96-5	0.001	mg/L	<0.001	----	----	----	----
Molybdenum	7439-98-7	0.001	mg/L	**0.010**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	**0.001**	----	----	----	----
Vanadium	7440-62-2	0.01	mg/L	**0.02**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Basin 2**	----	----	----	----
			Client sampling date / time	20-Jan-2017 13:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1701445-006**	--------	--------	--------	--------
				Result	----	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.13**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	**0.04**	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.53**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.57**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**0.7**	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**1.3**	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.02**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	----	----	----	----
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	**4.27**	----	----	----	----
Total Cations	----	0.01	meq/L	**4.60**	----	----	----	----
Ionic Balance	----	0.01	%	**3.62**	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	----	----	----	----

Analytical Results

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

			Client sample ID	**Basin 2**	**----**	**----**	**----**	**----**
			Client sampling date / time	20-Jan-2017 13:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1701445-006**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Chrysene	218-01-9	1	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ **Total Xylenes**	1330-20-7	2	µg/L	<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER)**			Client sample ID	**Basin 2**	**----**	**----**	**----**	**----**
			Client sampling date / time	20-Jan-2017 13:00	----	----	----	----
Compound	CAS Number	LOR	Unit	**ES1701445-006**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	**23.6**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%	**51.5**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%	**58.1**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	**77.6**	----	----	----	----
Anthracene-d10	1719-06-8	1	%	**85.1**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1	%	**79.3**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**117**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**121**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**108**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

CERTIFICATE OF ANALYSIS

Work Order	: **ES1703849**	Page	: 1 of 22
Amendment	: **1**		
Client	: **EMM CONSULTING PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS CAROLINA SARDELLA	Contact	: Customer Services ES
Address	: Ground Floor Suite 1 20 Chandos Street St Leonards NSW 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9493 9500	Telephone	: +61-2-8784 8555
Project	: J17004	Date Samples Received	: 17-Feb-2017 19:45
Order number	: ----	Date Analysis Commenced	: 18-Feb-2017
C-O-C number	: SYBQ-202-16 EMM	Issue Date	: 07-Mar-2017 11:14
Sampler	: Scarolina Sardella		
Site	: ----		
Quote number	: SYBQ/202/15		
No. of samples received	: 6		
No. of samples analysed	: 6		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ashesh Patel	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Dian Dao		Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- EK071G: Poor spike recovery for Reactive Phosphorus due to matrix interferences(confirmed by re-analysis).
- EG050G: Poor spike recovery for Hexavalent Chromium due to matrix interferences(confirmed by re-analysis).
- TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- EP075: 'Sum of PAH' is the sum of the USEPA 16 priority PAHs
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**7900**	**580**	**732**	**4190**	**384**
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	**6660**	**1060**	**2070**	**2680**	**337**
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**168000**	**20300**	**20600**	----	----
Suspended Solids (SS)	----	5	mg/L	----	----	----	**48**	**202**
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**434**	**227**	**242**	**692**	**62**
Total Alkalinity as CaCO3	----	1	mg/L	**434**	**227**	**242**	**692**	**62**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**26**	**11**	**57**	**35**	**54**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**2480**	**40**	**46**	**955**	**33**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**159**	**17**	**36**	**182**	**24**
Magnesium	7439-95-4	1	mg/L	**337**	**17**	**27**	**237**	**2**
Sodium	7440-23-5	1	mg/L	**989**	**88**	**77**	**335**	**34**
Potassium	7440-09-7	1	mg/L	**9**	**1**	**1**	**8**	**15**
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	**0.17**	**0.02**	<0.01	**0.14**
Arsenic	7440-38-2	0.001	mg/L	**0.002**	<0.001	<0.001	**0.012**	**0.003**
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	7440-39-3	0.001	mg/L	**0.986**	**0.032**	**0.054**	**1.47**	**0.011**
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	**0.001**
Cobalt	7440-48-4	0.001	mg/L	**0.004**	**0.002**	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	**0.003**	**0.004**	<0.001	**0.002**
Gallium	7440-55-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	**0.863**	**0.232**	**0.005**	**0.162**	**0.002**
Molybdenum	7439-98-7	0.001	mg/L	**0.006**	**0.012**	**0.018**	**0.002**	**0.012**
Nickel	7440-02-0	0.001	mg/L	**0.003**	**0.005**	**0.002**	<0.001	**0.002**

Analytical Results

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

			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	**0.06**
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	**0.006**	<0.005
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.8**	**0.7**	**0.6**	**0.1**	**0.6**
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.58**	**1.27**	**0.07**	**0.26**	**0.69**
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	**0.42**
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.04**	**0.02**	**0.14**	**0.09**	**0.30**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.04**	**0.02**	**0.14**	**0.09**	**0.72**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**7.6**	**10.0**	**14.2**	**0.3**	**1.8**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**7.6**	**10.0**	**14.3**	**0.4**	**2.5**
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**4.37**	**5.39**	**12.8**	**0.03**	**0.20**
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	**0.12**	<0.01	<0.01	<0.01
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	**79.2**	**5.89**	**7.32**	**41.5**	**3.29**
Total Cations	----	0.01	meq/L	**78.9**	**6.10**	**7.39**	**43.4**	**3.22**
Ionic Balance	----	0.01	%	**0.16**	**1.73**	**0.50**	**2.20**	**1.06**
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	5	µg/L	----	<5	<5	----	<5
Isopropylbenzene	98-82-8	5	µg/L	----	<5	<5	----	<5
n-Propylbenzene	103-65-1	5	µg/L	----	<5	<5	----	<5
1.3.5-Trimethylbenzene	108-67-8	5	µg/L	----	<5	<5	----	<5

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP074A: Monocyclic Aromatic Hydrocarbons - Continued								
sec-Butylbenzene	135-98-8	5	µg/L	----	<5	<5	----	<5
1.2.4-Trimethylbenzene	95-63-6	5	µg/L	----	<5	<5	----	<5
tert-Butylbenzene	98-06-6	5	µg/L	----	<5	<5	----	<5
p-Isopropyltoluene	99-87-6	5	µg/L	----	<5	<5	----	<5
n-Butylbenzene	104-51-8	5	µg/L	----	<5	<5	----	<5
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	50	µg/L	----	<50	<50	----	<50
2-Butanone (MEK)	78-93-3	50	µg/L	----	<50	<50	----	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	----	<50	<50	----	<50
2-Hexanone (MBK)	591-78-6	50	µg/L	----	<50	<50	----	<50
EP074C: Sulfonated Compounds								
Carbon disulfide	75-15-0	5	µg/L	----	<5	<5	----	<5
EP074D: Fumigants								
2.2-Dichloropropane	594-20-7	5	µg/L	----	<5	<5	----	<5
1.2-Dichloropropane	78-87-5	5	µg/L	----	<5	<5	----	<5
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	----	<5	<5	----	<5
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	----	<5	<5	----	<5
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	----	<5	<5	----	<5
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	50	µg/L	----	<50	<50	----	<50
Chloromethane	74-87-3	50	µg/L	----	<50	<50	----	<50
Vinyl chloride	75-01-4	50	µg/L	----	<50	<50	----	<50
Bromomethane	74-83-9	50	µg/L	----	<50	<50	----	<50
Chloroethane	75-00-3	50	µg/L	----	<50	<50	----	<50
Trichlorofluoromethane	75-69-4	50	µg/L	----	<50	<50	----	<50
1.1-Dichloroethene	75-35-4	5	µg/L	----	<5	<5	----	<5
Iodomethane	74-88-4	5	µg/L	----	<5	<5	----	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L	----	<5	<5	----	<5
1.1-Dichloroethane	75-34-3	5	µg/L	----	<5	<5	----	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L	----	<5	<5	----	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L	----	<5	<5	----	<5
1.1-Dichloropropylene	563-58-6	5	µg/L	----	<5	<5	----	<5
Carbon Tetrachloride	56-23-5	5	µg/L	----	<5	<5	----	<5
1.2-Dichloroethane	107-06-2	5	µg/L	----	<5	<5	----	<5

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued								
Trichloroethene	79-01-6	5	µg/L	----	<5	<5	----	<5
Dibromomethane	74-95-3	5	µg/L	----	<5	<5	----	<5
1.1.2-Trichloroethane	79-00-5	5	µg/L	----	<5	<5	----	<5
1.3-Dichloropropane	142-28-9	5	µg/L	----	<5	<5	----	<5
Tetrachloroethene	127-18-4	5	µg/L	----	<5	<5	----	<5
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	----	<5	<5	----	<5
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	----	<5	<5	----	<5
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	----	<5	<5	----	<5
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	----	<5	<5	----	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L	----	<5	<5	----	<5
Pentachloroethane	76-01-7	5	µg/L	----	<5	<5	----	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	----	<5	<5	----	<5
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	5	µg/L	----	<5	<5	----	<5
Bromobenzene	108-86-1	5	µg/L	----	<5	<5	----	<5
2-Chlorotoluene	95-49-8	5	µg/L	----	<5	<5	----	<5
4-Chlorotoluene	106-43-4	5	µg/L	----	<5	<5	----	<5
1.2.3-Trichlorobenzene	87-61-6	5	µg/L	----	<5	<5	----	<5
EP074G: Trihalomethanes								
Chloroform	67-66-3	5	µg/L	----	<5	<5	----	**5**
Bromodichloromethane	75-27-4	5	µg/L	----	<5	<5	----	<5
Dibromochloromethane	124-48-1	5	µg/L	----	<5	<5	----	<5
Bromoform	75-25-2	5	µg/L	----	<5	<5	----	<5
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
EP075A: Phenolic Compounds								
Phenol	108-95-2	2	µg/L	----	<2	<2	----	<2
2-Chlorophenol	95-57-8	2	µg/L	----	<2	<2	----	<2
2-Methylphenol	95-48-7	2	µg/L	----	<2	<2	----	<2
3- & 4-Methylphenol	1319-77-3	4	µg/L	----	<4	<4	----	<4
2-Nitrophenol	88-75-5	2	µg/L	----	<2	<2	----	<2
2.4-Dimethylphenol	105-67-9	2	µg/L	----	<2	<2	----	<2
2.4-Dichlorophenol	120-83-2	2	µg/L	----	<2	<2	----	<2
2.6-Dichlorophenol	87-65-0	2	µg/L	----	<2	<2	----	<2
4-Chloro-3-methylphenol	59-50-7	2	µg/L	----	<2	<2	----	<2
2.4.6-Trichlorophenol	88-06-2	2	µg/L	----	<2	<2	----	<2
2.4.5-Trichlorophenol	95-95-4	2	µg/L	----	<2	<2	----	<2
Pentachlorophenol	87-86-5	4	µg/L	----	<4	<4	----	<4
EP075B: Polynuclear Aromatic Hydrocarbons								
2-Methylnaphthalene	91-57-6	2	µg/L	----	<2	<2	----	<2
2-Chloronaphthalene	91-58-7	2	µg/L	----	<2	<2	----	<2
N-2-Fluorenyl Acetamide	53-96-3	2	µg/L	----	<2	<2	----	<2
7.12-Dimethylbenz(a)anthracene	57-97-6	2	µg/L	----	<2	<2	----	<2
3-Methylcholanthrene	56-49-5	2	µg/L	----	<2	<2	----	<2
EP075C: Phthalate Esters								
Dimethyl phthalate	131-11-3	2	µg/L	----	<2	<2	----	<2
Diethyl phthalate	84-66-2	2	µg/L	----	<2	<2	----	<2
Di-n-butyl phthalate	84-74-2	2	µg/L	----	<2	<2	----	<2
Butyl benzyl phthalate	85-68-7	2	µg/L	----	<2	<2	----	<2
bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L	----	**669**	<10	----	<10
Di-n-octylphthalate	117-84-0	2	µg/L	----	**4**	<2	----	<2

Analytical Results

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

			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP075D: Nitrosamines								
N-Nitrosomethylethylamine	10595-95-6	2	µg/L	----	<2	<2	----	<2
N-Nitrosodiethylamine	55-18-5	2	µg/L	----	<2	<2	----	<2
N-Nitrosopyrrolidine	930-55-2	4	µg/L	----	<4	<4	----	<4
N-Nitrosomorpholine	59-89-2	2	µg/L	----	<2	<2	----	<2
N-Nitrosodi-n-propylamine	621-64-7	2	µg/L	----	<2	<2	----	<2
N-Nitrosopiperidine	100-75-4	2	µg/L	----	<2	<2	----	<2
N-Nitrosodibutylamine	924-16-3	2	µg/L	----	<2	<2	----	<2
N-Nitrosodiphenyl & Diphenylamine	86-30-6 122-39-4	4	µg/L	----	<4	<4	----	<4
Methapyrilene	91-80-5	2	µg/L	----	<2	<2	----	<2
EP075E: Nitroaromatics and Ketones								
2-Picoline	109-06-8	2	µg/L	----	<2	<2	----	<2
Acetophenone	98-86-2	2	µg/L	----	<2	<2	----	<2
Nitrobenzene	98-95-3	2	µg/L	----	<2	<2	----	<2
Isophorone	78-59-1	2	µg/L	----	<2	<2	----	<2
2.6-Dinitrotoluene	606-20-2	4	µg/L	----	<4	<4	----	<4
2.4-Dinitrotoluene	121-14-2	4	µg/L	----	<4	<4	----	<4
1-Naphthylamine	134-32-7	2	µg/L	----	<2	<2	----	<2
4-Nitroquinoline-N-oxide	56-57-5	2	µg/L	----	<2	<2	----	<2
5-Nitro-o-toluidine	99-55-8	2	µg/L	----	<2	<2	----	<2
Azobenzene	103-33-3	2	µg/L	----	<2	<2	----	<2
1.3.5-Trinitrobenzene	99-35-4	2	µg/L	----	<2	<2	----	<2
Phenacetin	62-44-2	2	µg/L	----	<2	<2	----	<2
4-Aminobiphenyl	92-67-1	2	µg/L	----	<2	<2	----	<2
Pentachloronitrobenzene	82-68-8	2	µg/L	----	<2	<2	----	<2
Pronamide	23950-58-5	2	µg/L	----	<2	<2	----	<2
Dimethylaminoazobenzene	60-11-7	2	µg/L	----	<2	<2	----	<2
Chlorobenzilate	510-15-6	2	µg/L	----	<2	<2	----	<2
EP075F: Haloethers								
Bis(2-chloroethyl) ether	111-44-4	2	µg/L	----	<2	<2	----	<2
Bis(2-chloroethoxy) methane	111-91-1	2	µg/L	----	<2	<2	----	<2
4-Chlorophenyl phenyl ether	7005-72-3	2	µg/L	----	<2	<2	----	<2
4-Bromophenyl phenyl ether	101-55-3	2	µg/L	----	<2	<2	----	<2
EP075G: Chlorinated Hydrocarbons								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP075G: Chlorinated Hydrocarbons - Continued								
1.3-Dichlorobenzene	541-73-1	2	µg/L	----	<2	<2	----	<2
1.4-Dichlorobenzene	106-46-7	2	µg/L	----	<2	<2	----	<2
1.2-Dichlorobenzene	95-50-1	2	µg/L	----	<2	<2	----	<2
Hexachloroethane	67-72-1	2	µg/L	----	<2	<2	----	<2
1.2.4-Trichlorobenzene	120-82-1	2	µg/L	----	<2	<2	----	<2
Hexachloropropylene	1888-71-7	2	µg/L	----	<2	<2	----	<2
Hexachlorobutadiene	87-68-3	2	µg/L	----	<2	<2	----	<2
Hexachlorocyclopentadiene	77-47-4	10	µg/L	----	<10	<10	----	<10
Pentachlorobenzene	608-93-5	2	µg/L	----	<2	<2	----	<2
Hexachlorobenzene (HCB)	118-74-1	4	µg/L	----	<4	<4	----	<4
EP075H: Anilines and Benzidines								
Aniline	62-53-3	2	µg/L	----	<2	<2	----	<2
4-Chloroaniline	106-47-8	2	µg/L	----	<2	<2	----	<2
2-Nitroaniline	88-74-4	4	µg/L	----	<4	<4	----	<4
3-Nitroaniline	99-09-2	4	µg/L	----	<4	<4	----	<4
Dibenzofuran	132-64-9	2	µg/L	----	<2	<2	----	<2
4-Nitroaniline	100-01-6	2	µg/L	----	<2	<2	----	<2
Carbazole	86-74-8	2	µg/L	----	<2	<2	----	<2
3.3`-Dichlorobenzidine	91-94-1	2	µg/L	----	<2	<2	----	<2
EP075I: Organochlorine Pesticides								
alpha-BHC	319-84-6	2	µg/L	----	<2	<2	----	<2
beta-BHC	319-85-7	2	µg/L	----	<2	<2	----	<2
gamma-BHC	58-89-9	2	µg/L	----	<2	<2	----	<2
delta-BHC	319-86-8	2	µg/L	----	<2	<2	----	<2
Heptachlor	76-44-8	2	µg/L	----	<2	<2	----	<2
Aldrin	309-00-2	2	µg/L	----	<2	<2	----	<2
Heptachlor epoxide	1024-57-3	2	µg/L	----	<2	<2	----	<2
alpha-Endosulfan	959-98-8	2	µg/L	----	<2	<2	----	<2
4.4`-DDE	72-55-9	2	µg/L	----	<2	<2	----	<2
Dieldrin	60-57-1	2	µg/L	----	<2	<2	----	<2
Endrin	72-20-8	2	µg/L	----	<2	<2	----	<2
beta-Endosulfan	33213-65-9	2	µg/L	----	<2	<2	----	<2
4.4`-DDD	72-54-8	2	µg/L	----	<2	<2	----	<2
Endosulfan sulfate	1031-07-8	2	µg/L	----	<2	<2	----	<2

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP075I: Organochlorine Pesticides - Continued								
4.4`-DDT	50-29-3	4	µg/L	----	<4	<4	----	<4
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	4	µg/L	----	<4	<4	----	<4
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	4	µg/L	----	<4	<4	----	<4
EP075J: Organophosphorus Pesticides								
Dichlorvos	62-73-7	2	µg/L	----	<2	<2	----	<2
Dimethoate	60-51-5	2	µg/L	----	<2	<2	----	<2
Diazinon	333-41-5	2	µg/L	----	<2	<2	----	<2
Chlorpyrifos-methyl	5598-13-0	2	µg/L	----	<2	<2	----	<2
Malathion	121-75-5	2	µg/L	----	<2	<2	----	<2
Fenthion	55-38-9	2	µg/L	----	<2	<2	----	<2
Chlorpyrifos	2921-88-2	2	µg/L	----	<2	<2	----	<2
Pirimphos-ethyl	23505-41-1	2	µg/L	----	<2	<2	----	<2
Chlorfenvinphos	470-90-6	2	µg/L	----	<2	<2	----	<2
Prothiofos	34643-46-4	2	µg/L	----	<2	<2	----	<2
Ethion	563-12-2	2	µg/L	----	<2	<2	----	<2
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	**560**	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	**230**	<50	<50	<50
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	**790**	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	**700**	**110**	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	**100**	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	**800**	**110**	<100	<100
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	<100	<100	<100	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	MW01	MW02	MW03	MW04	Basin 2
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	CAS Number	LOR	Unit	ES1703849-001	ES1703849-002	ES1703849-003	ES1703849-004	ES1703849-005
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP234: Multiresidue Pesticides								
3-Hydroxy Carbofuran	16655-82-6	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Abamectin	71751-41-2	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Acephate	30560-19-1	0.5	µg/L	----	<0.5	<0.5	----	<0.5
Alachlor	15972-60-8	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Aldicarb	116-06-3	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Ametryn	834-12-8	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Aminopyralid	150114-71-9	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Amitraz	33089-61-1	100	µg/L	----	<100	<100	----	<100
Asulam	3337-71-1	2	µg/L	----	<2	<2	----	<2
Atrazine	1912-24-9	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Atrazine-desethyl	6190-65-4	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Atrazine-desisopropyl	1007-28-9	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Azinphos-ethyl	2642-71-9	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Azinphos-methyl	86-50-0	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Azoxystrobin	131860-33-8	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Bendiocarb	22781-23-3	0.1	µg/L	----	<0.10	<0.10	----	<0.10
Benomyl	17804-35-2	0.01	µg/L	----	<0.01	<0.01	----	**0.18**
Bensulfuron methyl	83055-99-6	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Bensulide	741-58-2	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Boscalid	188425-85-6	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Brodifacoum	56073-10-0	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Bromacil	314-40-9	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Bromophos-ethyl	4824-78-6	0.1	µg/L	----	<0.10	<0.10	----	<0.10
Bromoxynil	1689-84-5	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Butachlor	23184-66-9	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Carbaryl	63-25-2	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Carbendazim (Thiophanate methyl)	10605-21-7	0.1	µg/L	----	<0.1	<0.1	----	**0.2**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	CAS Number	LOR	Unit	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP234: Multiresidue Pesticides - Continued								
Carbofenothion	786-19-6	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Carbofuran	1563-66-2	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Carboxin	5234-68-4	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Carfentrazone-ethyl	128639-02-1	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Chlorantraniliprole	500008-45-7	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Chlorfenvinphos	470-90-6	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Chlorothalonil	1897-45-6	2	µg/L	----	<2	<2	----	<2
Chloroxuron	1982-47-4	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Chlorpyrifos	2921-88-2	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Chlorpyrifos-methyl	5598-13-0	0.2	µg/L	----	<0.2	<0.2	----	<0.2
Chlorsulfuron	64902-72-3	0.2	µg/L	----	<0.2	<0.2	----	<0.2
Coumaphos	56-72-4	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Cyanazine	21725-46-2	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Cyproconazole	94361-06-5	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Cyprodinil	121552-61-2	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Cyromazine	66215-27-8	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Demeton-O	298-03-0	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Demeton-O & Demeton-S	298-03-3/126-75-0	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Demeton-S	126-75-0	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Demeton-S-methyl	919-86-8	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Diazinon	333-41-5	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Dichlobenil	1194-65-6	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Dichlorprop-P	15165-67-0	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Dichlorvos	62-73-7	0.2	µg/L	----	<0.20	<0.20	----	<0.20
Diclofop-methyl	51338-27-3	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Dicofol	115-32-2	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Difenoconazole	119446-68-3	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Diflubenzuron	35367-38-5	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Diflufenican	83164-33-4	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Dimethoate	60-51-5	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Diphenamid	957-51-7	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Disulfoton	298-04-4	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Diuron	330-54-1	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Endothal	145-73-3	1	µg/L	----	<1.0	<1.0	----	<1.0
EPN	2104-64-5	0.05	µg/L	----	<0.05	<0.05	----	<0.05

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP234: Multiresidue Pesticides - Continued								
EPTC	759-94-4	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Ethion	563-12-2	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Ethoprophos	13194-48-4	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Etridiazole	2593-15-9	0.5	µg/L	----	<0.5	<0.5	----	<0.5
Fenamiphos	22224-92-6	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Fenarimol	60168-88-9	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Fenchlorphos (Ronnel)	299-84-3	10	µg/L	----	<10	<10	----	<10
Fenitrothion	122-14-5	2	µg/L	----	<2	<2	----	<2
Fenoxycarb	79127-80-3	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Fensulfothion	115-90-2	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Fenthion	55-38-9	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Fipronil	120068-37-3	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Flamprop methyl	52756-25-9	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Fluometuron	2164-17-2	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Flupropanate	756-09-2	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Flusilazole	85509-19-9	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Formothion	2540-82-1	20	µg/L	----	<20	<20	----	<20
Fosetyl Aluminium	39148-24-8	10	µg/L	----	<10	<10	----	<10
Haloxyfop	69806-34-4	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Hexaconazole	79983-71-4	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Hexaflurate	17029-22-0	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Hexazinone	51235-04-2	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Imazapyr	94795-74-1	10	µg/L	----	<10.0	<10.0	----	<10.0
Indoxacarb	173584-44-6	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Iodosulfuron methyl	144550-36-7	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Iprodione	36734-19-7	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Irgarol	28159-98-0	0.002	µg/L	----	<0.002	<0.002	----	<0.002
Isoproturon	34123-59-6	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Malathion	121-75-5	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Metalaxyl	57837-19-1	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Metalaxyl-M	70630-17-0	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Metaldehyde	108-62-3	10	µg/L	----	<10	<10	----	<10
Methidathion	950-37-8	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Methiocarb	2032-65-7	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Methomyl	16752-77-5	0.01	µg/L	----	<0.01	<0.01	----	<0.01

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP234: Multiresidue Pesticides - Continued								
Metolachlor	51218-45-2	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Metribuzin	21087-64-9	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Mevinphos	7786-34-7	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Molinate	2212-67-1	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Monocrotophos	6923-22-4	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Naftalofos	1491-41-4	1	µg/L	----	<1.0	<1.0	----	<1.0
Napropamide	15299-99-7	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Nicarbazin	399-95-0	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Nitralin	4726-14-1	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Norflurazon	27314-13-2	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Myclobutanil	88671-89-0	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Novaluron	116714-46-6	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Omethoate	1113-02-6	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Oryzalin	19044-88-3	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Oxamyl	23135-22-0	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Oxyfluorfen	42874-03-3	1	µg/L	----	<1.0	<1.0	----	<1.0
Paclobutrazole	76738-62-0	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Parathion	56-38-2	0.2	µg/L	----	<0.2	<0.2	----	<0.2
Parathion-methyl	298-00-0	2	µg/L	----	<2.0	<2.0	----	<2.0
Pebulate	1114-71-2	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Penconazole	66246-88-6	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Pendimethalin	40487-42-1	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Phorate	298-02-2	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Pirimicarb	23103-98-2	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Pirimiphos-ethyl	23505-41-1	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Pirimiphos-methyl	29232-93-7	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Prochloraz	67747-09-5	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Profenofos	41198-08-7	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Prometryn	7287-19-6	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Propachlor	1918-16-7	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Promecarb	2631-37-0	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Propamocarb	24579-73-5	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Propanil	709-98-8	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Propargite	2312-35-8	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Propazine	139-40-2	0.01	µg/L	----	<0.01	<0.01	----	<0.01

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP234: Multiresidue Pesticides - Continued								
Propiconazole	60207-90-1	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Propyzamide	23950-58-5	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Prothiofos	34643-46-4	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Pyraclostrobin	175013-18-0	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Pyrasulfatole	365400-11-9	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Pyrazophos	13457-18-6	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Pyrimethanil	53112-28-0	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Pyriproxyfen	95737-68-1	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Pyroxsulam	422556-08-9	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Quinclorac	84087-01-4	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Rimsulfuron	122931-48-0	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Siduron	1982-49-6	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Simazine	122-34-9	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Spirotetramat	203313-25-1	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Sulfotep	3689-24-5	0.005	µg/L	----	<0.005	<0.005	----	<0.005
Sulprofos	35400-43-2	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Tebuconazole	107534-96-3	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Tebuthiuron	34014-18-1	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Temephos	3383-96-8	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Terbacil	5902-51-2	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Terbufos	13071-79-9	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Terbuthylazine	5915-41-3	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Terbutryn	886-50-0	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Tetrachlorvinphos	22248-79-9	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Tetraconazole	112281-77-3	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Thiamethoxam	153719-23-4	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Thiobencarb	28249-77-6	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Thiodicarb	59669-26-0	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Thiometon	640-15-3	0.5	µg/L	----	<0.5	<0.5	----	<0.5
Toltrazuril	69004-03-1	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Triadimefon	43121-43-3	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Triadimenol	55219-65-3	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Triazophos	24017-47-8	0.005	µg/L	----	<0.005	<0.005	----	<0.005
Trichlorfon	52-68-6	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Trichloronate	327-98-0	0.5	µg/L	----	<0.5	<0.5	----	<0.5

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP234: Multiresidue Pesticides - Continued								
Trifloxystrobin	141517-21-7	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Trifloxysulfuron-sodium	199119-58-9	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Trifluralin	1582-09-8	10	µg/L	----	<10.0	<10.0	----	<10.0
Trinexapac Ethyl	95266-40-3	1	µg/L	----	<1	<1	----	<1
Vernolate	1929-77-7	0.1	µg/L	----	<0.1	<0.1	----	<0.1
EP247: Phenolics and Related Compounds								
2,4-Dinitrophenol	51-28-5	0.01	µg/L	----	<0.01	<0.01	----	<0.01
2-Methyl-4.6-dinitrophenol	8071-51-0	0.05	µg/L	----	<0.05	<0.05	----	<0.05
4-Nonylphenol (mixture of isomers)	84852-15-3	0.1	µg/L	----	<0.10	<0.10	----	<0.10
Hexachlorophene	70-30-4	0.1	µg/L	----	<0.10	<0.10	----	<0.10
4-Nitrophenol	100-02-7	0.1	µg/L	----	<0.10	<0.10	----	**0.13**
4-Chloro-3-methylphenol	59-50-7	0.1	µg/L	----	<0.10	<0.10	----	<0.10
Pentachlorophenol	87-86-5	0.1	µg/L	----	<0.10	<0.10	----	**0.13**
Dinoseb	88-85-7	0.1	µg/L	----	<0.10	<0.10	----	<0.10
Dalapon	75-99-0	0.1	µg/L	----	<0.10	<0.10	----	<0.10
Bisphenol-A	80-05-7	0.05	µg/L	----	**0.40**	**1.28**	----	**0.22**
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	5	%	----	**102**	**110**	----	**112**
Toluene-D8	2037-26-5	5	%	----	**95.4**	**103**	----	**101**
4-Bromofluorobenzene	460-00-4	5	%	----	**87.7**	**97.9**	----	**95.8**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	**23.0**	**19.1**	**21.3**	**21.7**	**18.2**
2-Chlorophenol-D4	93951-73-6	1	%	**50.4**	**43.5**	**50.2**	**51.8**	**36.2**
2.4.6-Tribromophenol	118-79-6	1	%	**66.3**	**65.6**	**74.8**	**69.4**	**39.9**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	**81.0**	**73.1**	**86.6**	**82.1**	**80.6**
Anthracene-d10	1719-06-8	1	%	**94.4**	**76.1**	**77.0**	**96.8**	**89.6**
4-Terphenyl-d14	1718-51-0	1	%	**81.9**	**67.9**	**89.7**	**87.8**	**84.6**
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	2	%	----	**40.3**	**46.6**	----	**23.8**
Phenol-d6	13127-88-3	2	%	----	**30.8**	**35.0**	----	**28.4**
2-Chlorophenol-D4	93951-73-6	2	%	----	**54.9**	**63.4**	----	**43.8**
2.4.6-Tribromophenol	118-79-6	2	%	----	**61.3**	**71.4**	----	**36.6**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	2	%	----	**62.8**	**71.4**	----	**62.7**
1.2-Dichlorobenzene-D4	2199-69-1	2	%	----	**59.7**	**67.8**	----	**59.2**
2-Fluorobiphenyl	321-60-8	2	%	----	**69.2**	**79.0**	----	**72.8**
Anthracene-d10	1719-06-8	2	%	----	**78.0**	**88.8**	----	**82.5**
4-Terphenyl-d14	1718-51-0	2	%	----	**61.4**	**73.9**	----	**67.7**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**110**	**105**	**114**	**116**	**116**
Toluene-D8	2037-26-5	2	%	**94.7**	**90.4**	**97.2**	**100**	**95.6**
4-Bromofluorobenzene	460-00-4	2	%	**100**	**91.8**	**102**	**105**	**100**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Water Leak**	**----**	**----**	**----**	**----**
			Client sampling date / time	17-Feb-2017 11:40	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-006**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**489**	----	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	**330**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**22**	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**112**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**112**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**46**	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**42**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**51**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	**5**	----	----	----	----
Sodium	7440-23-5	1	mg/L	**32**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**8**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.03**	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L	**0.002**	----	----	----	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	----	----	----	----
Barium	7440-39-3	0.001	mg/L	**0.034**	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	**0.003**	----	----	----	----
Gallium	7440-55-3	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Manganese	7439-96-5	0.001	mg/L	**0.017**	----	----	----	----
Molybdenum	7439-98-7	0.001	mg/L	**0.015**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	**0.001**	----	----	----	----
Vanadium	7440-62-2	0.01	mg/L	**0.02**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**Water Leak**	----	----	----	----
			Client sampling date / time	17-Feb-2017 11:40	----	----	----	----
Compound	CAS Number	LOR	Unit	**ES1703849-006**	--------	--------	--------	--------
				Result	----	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Zinc	7440-66-6	0.005	mg/L	**0.005**	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	----	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.8**	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.14**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	**0.03**	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.05**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.08**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**1.4**	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**1.5**	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.08**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	**0.02**	----	----	----	----
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	**4.38**	----	----	----	----
Total Cations	----	0.01	meq/L	**4.55**	----	----	----	----
Ionic Balance	----	0.01	%	**1.93**	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1	µg/L	<1.0	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**Water Leak**	----	----	----	----
			Client sampling date / time	17-Feb-2017 11:40	----	----	----	----
Compound	CAS Number	LOR	Unit	**ES1703849-006**	--------	--------	--------	--------
				Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Anthracene	120-12-7	1	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	**140**	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	**140**	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	**140**	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	**140**	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----

Analytical Results

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

			Client sample ID	**Water Leak**	----	----	----	----
			Client sampling date / time	17-Feb-2017 11:40	----	----	----	----
Compound	CAS Number	LOR	Unit	**ES1703849-006**	--------	--------	--------	--------
				Result	----	----	----	----
EP080: BTEXN - Continued								
^ **Total Xylenes**	1330-20-7	2	µg/L	<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	**21.1**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%	**47.8**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%	**73.7**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	**86.8**	----	----	----	----
Anthracene-d10	1719-06-8	1	%	**84.6**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1	%	**87.4**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**117**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**100**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**104**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	*CAS Number*	*Recovery Limits (%)* Low	*Recovery Limits (%)* High
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	78	133
Toluene-D8	2037-26-5	79	129
4-Bromofluorobenzene	460-00-4	81	124
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	10	117
Phenol-d6	13127-88-3	10	69
2-Chlorophenol-D4	93951-73-6	21	130
2.4.6-Tribromophenol	118-79-6	10	151
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	29	142
1.2-Dichlorobenzene-D4	2199-69-1	24	121
2-Fluorobiphenyl	321-60-8	27	135
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	21	123
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order : **ES1707683**
Client : **EMM CONSULTING PTY LTD**
Contact : MS CAROLINA SARDELLA
Address : Ground Floor Suite 1 20 Chandos Street
St Leonards NSW 2065
Telephone : +61 02 9493 9500
Project : J17004
Order number : ----
C-O-C number : ----
Sampler : CAROLINA SARDELLA
Site : ----
Quote number : SYBQ/202/16
No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 7
Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 31-Mar-2017 12:25
Date Analysis Commenced : 31-Mar-2017
Issue Date : 06-Apr-2017 14:10

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Dian Dao		Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Raymond Commodore	Instrument Chemist	Sydney Inorganics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- It has been noted that Nitrite is greater than NOx for sample 1, however this difference is within the limits of experimental variation.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**QA1**
			Client sampling date / time	31-Mar-2017 10:30	31-Mar-2017 09:30	31-Mar-2017 11:30	31-Mar-2017 09:00	31-Mar-2017 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1707683-001**	**ES1707683-002**	**ES1707683-003**	**ES1707683-004**	**ES1707683-005**
				Result	Result	Result	Result	Result
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**9280**	**705**	**883**	**2670**	**727**
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	**6110**	**620**	**892**	**1450**	**910**
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**2270**	**6090**	**6150**	**349**	**3930**
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**526**	**242**	**247**	**733**	**244**
Total Alkalinity as CaCO3	----	1	mg/L	**526**	**242**	**247**	**733**	**244**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**30**	**54**	**115**	**14**	**60**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**2890**	**46**	**64**	**471**	**48**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**218**	**29**	**48**	**143**	**29**
Magnesium	7439-95-4	1	mg/L	**404**	**29**	**42**	**167**	**28**
Sodium	7440-23-5	1	mg/L	**1070**	**90**	**94**	**181**	**86**
Potassium	7440-09-7	1	mg/L	**8**	**3**	**2**	**8**	**3**
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.03**	<0.01	**0.05**	<0.01	**0.04**
Arsenic	7440-38-2	0.001	mg/L	**0.001**	<0.001	<0.001	**0.003**	<0.001
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	7440-39-3	0.001	mg/L	**1.18**	**0.056**	**0.034**	**1.12**	**0.057**
Cadmium	7440-43-9	0.0001	mg/L	**0.0002**	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	7440-48-4	0.001	mg/L	**0.007**	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	**0.014**	<0.001	<0.001
Gallium	7440-55-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	**1.53**	**0.286**	**0.344**	**0.146**	**0.284**
Molybdenum	7439-98-7	0.001	mg/L	**0.005**	**0.010**	**0.017**	**0.001**	**0.010**
Nickel	7440-02-0	0.001	mg/L	**0.006**	**0.002**	**0.003**	**0.002**	**0.001**
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**QA1**
			Client sampling date / time	31-Mar-2017 10:30	31-Mar-2017 09:30	31-Mar-2017 11:30	31-Mar-2017 09:00	31-Mar-2017 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1707683-001**	**ES1707683-002**	**ES1707683-003**	**ES1707683-004**	**ES1707683-005**
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	**0.022**	<0.005
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.6**	**0.7**	**0.6**	**0.2**	**0.7**
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.55**	**2.64**	**0.22**	**0.22**	**2.51**
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	**0.01**	<0.01	**0.04**	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	**0.04**	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	**0.08**	<0.01	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**1.1**	**8.1**	**2.6**	**1.1**	**6.5**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**1.1**	**8.1**	**2.7**	**1.1**	**6.5**
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.87**	**4.83**	**2.49**	**1.66**	**4.12**
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	**0.13**	**0.15**	**0.04**	**0.12**	**0.18**
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	**92.6**	**7.26**	**9.13**	**28.2**	**7.48**
Total Cations	----	0.01	meq/L	**90.9**	**7.82**	**9.99**	**29.0**	**7.57**
Ionic Balance	----	0.01	%	**0.97**	**3.77**	**4.48**	**1.28**	**0.60**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	MW01	MW02	MW03	MW04	QA1
			Client sampling date / time	31-Mar-2017 10:30	31-Mar-2017 09:30	31-Mar-2017 11:30	31-Mar-2017 09:00	31-Mar-2017 00:00
Compound	CAS Number	LOR	Unit	ES1707683-001	ES1707683-002	ES1707683-003	ES1707683-004	ES1707683-005
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Anthracene	120-12-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	<100	<100	<100	<100
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	<100	<100	<100	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**QA1**
			Client sampling date / time	31-Mar-2017 10:30	31-Mar-2017 09:30	31-Mar-2017 11:30	31-Mar-2017 09:00	31-Mar-2017 00:00
Compound	CAS Number	LOR	Unit	**ES1707683-001**	**ES1707683-002**	**ES1707683-003**	**ES1707683-004**	**ES1707683-005**
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
^ **Total Xylenes**	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ **Sum of BTEX**	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	**31.2**	**29.9**	**25.1**	**30.4**	**26.4**
2-Chlorophenol-D4	93951-73-6	1	%	**59.9**	**56.1**	**52.1**	**60.5**	**50.4**
2.4.6-Tribromophenol	118-79-6	1	%	**55.0**	**51.7**	**51.7**	**60.8**	**56.0**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	**71.0**	**66.9**	**64.7**	**73.8**	**64.7**
Anthracene-d10	1719-06-8	1	%	**81.9**	**71.1**	**71.0**	**77.0**	**72.0**
4-Terphenyl-d14	1718-51-0	1	%	**77.5**	**67.4**	**66.9**	**74.0**	**68.9**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**102**	**102**	**103**	**102**	**104**
Toluene-D8	2037-26-5	2	%	**102**	**101**	**106**	**101**	**104**
4-Bromofluorobenzene	460-00-4	2	%	**108**	**109**	**113**	**108**	**110**

Surrogate Control Limits

Sub-Matrix: **WATER**

		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

CERTIFICATE OF ANALYSIS

Work Order	: **ES1709478**	Page	: 1 of 7
Client	: **EMM CONSULTING PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS CAROLINA SARDELLA	Contact	: Customer Services ES
Address	: Ground Floor Suite 1 20 Chandos Street St Leonards NSW 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9493 9500	Telephone	: +61-2-8784 8555
Project	: J17004	Date Samples Received	: 21-Apr-2017 12:38
Order number	: ----	Date Analysis Commenced	: 22-Apr-2017
C-O-C number	: ----	Issue Date	: 28-Apr-2017 16:15
Sampler	: CAROLINA SARDELLA		
Site	: ----		
Quote number	: SYBQ/202/16		
No. of samples received	: 5		
No. of samples analysed	: 5		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Pabi Subba	Senior Organic Chemist	Sydney Organics, Smithfield, NSW
Raymond Commodore	Instrument Chemist	Sydney Inorganics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- Poor spike recovery for Flouride due to matrix interferences(confirmed by re-analysis).
- EK055G: It has been noted that Ammonia is greater than TKN for sample No 4 & 5 , however this difference is within the limits of experimental variation.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**QA1**
			Client sampling date / time	21-Apr-2017 11:15	21-Apr-2017 09:45	21-Apr-2017 10:15	21-Apr-2017 08:30	21-Apr-2017 00:00
Compound	CAS Number	LOR	Unit	**ES1709478-001**	**ES1709478-002**	**ES1709478-003**	**ES1709478-004**	**ES1709478-005**
				Result	Result	Result	Result	Result
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**8910**	**618**	**984**	**4120**	**4130**
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	**4820**	**458**	**710**	**2480**	**2480**
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**1720**	**472**	**1470**	**56**	**52**
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**439**	**200**	**236**	**579**	**632**
Total Alkalinity as CaCO3	----	1	mg/L	**439**	**200**	**236**	**579**	**632**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**31**	**43**	**163**	**36**	**46**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**2870**	**43**	**76**	**936**	**934**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**190**	**23**	**53**	**154**	**164**
Magnesium	7439-95-4	1	mg/L	**318**	**22**	**43**	**183**	**188**
Sodium	7440-23-5	1	mg/L	**871**	**74**	**85**	**297**	**309**
Potassium	7440-09-7	1	mg/L	**8**	**2**	**2**	**7**	**7**
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	7440-38-2	0.001	mg/L	**0.002**	<0.001	**0.001**	**0.008**	**0.007**
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	7440-39-3	0.001	mg/L	**0.931**	**0.039**	**0.047**	**1.08**	**1.09**
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	7440-48-4	0.001	mg/L	**0.003**	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	**0.057**	<0.001	<0.001
Gallium	7440-55-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	**0.637**	**0.222**	**0.077**	**0.145**	**0.146**
Molybdenum	7439-98-7	0.001	mg/L	**0.006**	**0.008**	**0.010**	**0.002**	<0.001
Nickel	7440-02-0	0.001	mg/L	**0.010**	**0.003**	**0.003**	<0.001	<0.001
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**QA1**
			Client sampling date / time	21-Apr-2017 11:15	21-Apr-2017 09:45	21-Apr-2017 10:15	21-Apr-2017 08:30	21-Apr-2017 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1709478-001**	**ES1709478-002**	**ES1709478-003**	**ES1709478-004**	**ES1709478-005**
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	**0.009**	**0.006**
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.6**	**0.7**	**0.5**	**0.2**	**0.2**
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.56**	**1.67**	**0.01**	**0.24**	**0.24**
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.04**	**0.02**	**0.22**	**0.03**	**0.05**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.04**	**0.02**	**0.22**	**0.03**	**0.05**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**0.8**	**2.0**	**0.8**	**0.2**	**0.2**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**0.8**	**2.0**	**1.0**	**0.2**	**0.2**
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.34**	**1.02**	**0.73**	**0.02**	**0.08**
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	**0.06**	**0.10**	<0.01	<0.01	<0.01
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	**90.4**	**6.10**	**10.2**	**38.7**	**39.9**
Total Cations	----	0.01	meq/L	**73.7**	**6.23**	**9.93**	**35.8**	**37.3**
Ionic Balance	----	0.01	%	**10.1**	**1.01**	**1.59**	**3.86**	**3.44**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**QA1**
			Client sampling date / time	21-Apr-2017 11:15	21-Apr-2017 09:45	21-Apr-2017 10:15	21-Apr-2017 08:30	21-Apr-2017 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**ES1709478-001**	**ES1709478-002**	**ES1709478-003**	**ES1709478-004**	**ES1709478-005**
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Anthracene	120-12-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	<100	<100	<100	<100
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	<100	<100	<100	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	**1**	**1**
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**QA1**
			Client sampling date / time	21-Apr-2017 11:15	21-Apr-2017 09:45	21-Apr-2017 10:15	21-Apr-2017 08:30	21-Apr-2017 00:00
Compound	CAS Number	LOR	Unit	**ES1709478-001**	**ES1709478-002**	**ES1709478-003**	**ES1709478-004**	**ES1709478-005**
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
^ **Total Xylenes**	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ **Sum of BTEX**	----	1	µg/L	<1	<1	<1	**1**	**1**
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	**16.1**	**20.2**	**16.0**	**18.7**	**21.3**
2-Chlorophenol-D4	93951-73-6	1	%	**37.2**	**41.4**	**38.8**	**39.5**	**40.4**
2.4.6-Tribromophenol	118-79-6	1	%	**37.9**	**47.0**	**40.0**	**40.5**	**38.5**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	**60.4**	**70.0**	**56.2**	**66.1**	**62.3**
Anthracene-d10	1719-06-8	1	%	**88.3**	**96.9**	**90.1**	**85.0**	**92.4**
4-Terphenyl-d14	1718-51-0	1	%	**67.2**	**72.0**	**65.2**	**72.6**	**68.3**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**117**	**119**	**130**	**117**	**126**
Toluene-D8	2037-26-5	2	%	**105**	**111**	**121**	**107**	**115**
4-Bromofluorobenzene	460-00-4	2	%	**85.8**	**108**	**95.8**	**108**	**114**

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	*CAS Number*	*Recovery Limits (%)* Low	*Recovery Limits (%)* High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

CERTIFICATE OF ANALYSIS

Work Order : **ES1713097**
Client : **EMM CONSULTING PTY LTD**
Contact : MS CAROLINA SARDELLA
Address : Ground Floor Suite 1 20 Chandos Street
St Leonards NSW 2065
Telephone : +61 02 9493 9500
Project : J17004
Order number : ----
C-O-C number : ----
Sampler : CAROLINA SARDELLA
Site : ----
Quote number : SYBQ/202/16
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 7
Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 30-May-2017 11:25
Date Analysis Commenced : 30-May-2017
Issue Date : 06-Jun-2017 11:06

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- TDS by method EA-015 may bias high for various samples due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**----**
			Client sampling date / time	30-May-2017 09:30	30-May-2017 10:00	30-May-2017 10:30	30-May-2017 09:00	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1713097-001**	**ES1713097-002**	**ES1713097-003**	**ES1713097-004**	--------
				Result	Result	Result	Result	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**10300**	**535**	**974**	**3760**	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	**5760**	**819**	**801**	**2650**	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**20800**	**1030**	**7120**	**111**	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**497**	**179**	**263**	**615**	----
Total Alkalinity as CaCO3	----	1	mg/L	**497**	**179**	**263**	**615**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**28**	**32**	**154**	**38**	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**3340**	**37**	**68**	**855**	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**222**	**18**	**48**	**152**	----
Magnesium	7439-95-4	1	mg/L	**423**	**17**	**44**	**186**	----
Sodium	7440-23-5	1	mg/L	**1110**	**68**	**94**	**335**	----
Potassium	7440-09-7	1	mg/L	**7**	**2**	**1**	**7**	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	**0.07**	<0.01	----
Arsenic	7440-38-2	0.001	mg/L	**0.002**	<0.001	<0.001	**0.008**	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Barium	7440-39-3	0.001	mg/L	**1.29**	**0.035**	**0.039**	**1.19**	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	**0.009**	**0.001**	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	**0.076**	<0.001	----
Gallium	7440-55-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Manganese	7439-96-5	0.001	mg/L	**2.16**	**0.218**	**0.050**	**0.143**	----
Molybdenum	7439-98-7	0.001	mg/L	**0.013**	**0.011**	**0.013**	**0.001**	----
Nickel	7440-02-0	0.001	mg/L	**0.008**	**0.004**	**0.002**	<0.001	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----

Analytical Results

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

Compound	*CAS Number*	*LOR*	*Unit*	**MW01**	**MW02**	**MW03**	**MW04**	**----**
			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**----**
			Client sampling date / time	30-May-2017 09:30	30-May-2017 10:00	30-May-2017 10:30	30-May-2017 09:00	----
				ES1713097-001	**ES1713097-002**	**ES1713097-003**	**ES1713097-004**	**--------**
				Result	Result	Result	Result	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Zinc	7440-66-6	0.005	mg/L	**0.005**	<0.005	<0.005	<0.005	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.7**	**0.6**	**0.4**	**0.2**	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.37**	**1.54**	**0.02**	**0.24**	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	**0.01**	<0.01	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	**0.01**	<0.01	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.01**	<0.01	**0.01**	<0.01	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**14.6**	**3.0**	**7.2**	**0.3**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**14.6**	**3.0**	**7.2**	**0.3**	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**6.88**	**1.05**	**8.17**	**0.05**	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	**0.12**	<0.01	<0.01	----
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	**105**	**5.29**	**10.4**	**37.2**	----
Total Cations	----	0.01	meq/L	**94.4**	**5.31**	**10.1**	**37.6**	----
Ionic Balance	----	0.01	%	**5.21**	**0.19**	**1.21**	**0.60**	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Fluorene	86-73-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**----**
			Client sampling date / time	30-May-2017 09:30	30-May-2017 10:00	30-May-2017 10:30	30-May-2017 09:00	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1713097-001**	**ES1713097-002**	**ES1713097-003**	**ES1713097-004**	**--------**
				Result	Result	Result	Result	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Anthracene	120-12-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Pyrene	129-00-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Chrysene	218-01-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	----
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	<100	<100	<100	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	<100	<100	<100	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	----
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**----**
			Client sampling date / time	30-May-2017 09:30	30-May-2017 10:00	30-May-2017 10:30	30-May-2017 09:00	----
Compound	CAS Number	LOR	Unit	**ES1713097-001**	**ES1713097-002**	**ES1713097-003**	**ES1713097-004**	**--------**
				Result	Result	Result	Result	----
EP080: BTEXN - Continued								
^ **Total Xylenes**	1330-20-7	2	µg/L	<2	<2	<2	<2	----
^ **Sum of BTEX**	----	1	µg/L	<1	<1	<1	<1	----
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	**26.2**	**26.0**	**25.0**	**21.7**	----
2-Chlorophenol-D4	93951-73-6	1	%	**56.8**	**62.4**	**71.6**	**70.7**	----
2.4.6-Tribromophenol	118-79-6	1	%	**52.8**	**78.3**	**66.6**	**51.1**	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	**76.2**	**89.1**	**69.8**	**79.0**	----
Anthracene-d10	1719-06-8	1	%	**93.4**	**91.3**	**98.2**	**77.0**	----
4-Terphenyl-d14	1718-51-0	1	%	**72.2**	**81.9**	**71.4**	**75.7**	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**99.1**	**102**	**102**	**103**	----
Toluene-D8	2037-26-5	2	%	**105**	**107**	**103**	**103**	----
4-Bromofluorobenzene	460-00-4	2	%	**105**	**106**	**107**	**99.4**	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
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1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

Appendix E

Surface water mitigation and monitoring plan

Boral Widemere
Surface Water Monitoring and Mitigation Plan

For: Boral Recycling Pty Ltd

April 2017

PROJECT INFORMATION

Project Name:	Boral Widemere: Surface Water Monitoring and Mitigation Plan
Project Number:	PA1554
Report for:	Boral Recycling Pty Ltd

PREPARATION, REVIEW AND AUTHORISATION

Revision #	Date	Prepared by	Reviewed by	Approved for Issue by
A	26.4.2017	Chris Kuczera		
B	28.4.2017	Chris Kuczera	RHDHV, Victory Engineering, Boral and EMM	Ben Patterson

COMPANY DETAILS

Royal HaskoningDHV

Level 3, 2 Market Street

Newcastle, NSW, 2300

Tel. 4926 9500

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ABN 66 153 656 252

This report has been prepared by Haskoning Australia Pty Ltd solely for its client in accordance with the terms of appointment, the methodology, qualifications, assumptions and constraints as set out in the report and may not be relied upon by any other party for any use whatsoever without prior written consent from Haskoning Australia Pty Ltd.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Boral Recycling Pty Limited (Boral) operates the Widemere Recycling Facility (the facility). The facility accepts construction and demolition waste, which is separated and crushed onsite before blending with quarry materials to produce saleable construction materials. On 25 November 2016, Boral received conditional consent to increase the processing capacity of the facility to 1,000,000 tonnes per annum (Consent SD 6525). The consent included 27 consent conditions associated with site water management. In addition to the consent conditions, The NSW Environment Protection Authority (EPA) modified the facility's Environmental Protection Licence (EPL no.11815). The modified EPL included a Pollution Reduction Program (PRP). The Operational Environmental Management Plan, of which this SWMMP is a sub-plan, covers the entire Development and applies to a processing capacity of up to 1,000,000 tonnes per annum (tpa).

This report documents a Surface Water Mitigation and Monitoring Plan (SWMMP) and addresses the relevant requirements of EPL and consent conditions. The scope of the SWMMP broadly includes:

- A holistic review of the existing water management system. This review is to be informed by the outcomes of the SWCA and a calibrated a water balance model of the facility's water management system.

- An assessment of the effectiveness and benefits of a range of water management improvement options. This options assessment exercise is to be used to justify any proposed changes to the existing water management system.

- A proposed surface water monitoring program.

This SWMMP makes frequent reference to the Surface Water Characterisation Assessment (SWCA) that was submitted by Boral to the EPA on 5 April 2017, as required by the PRP.

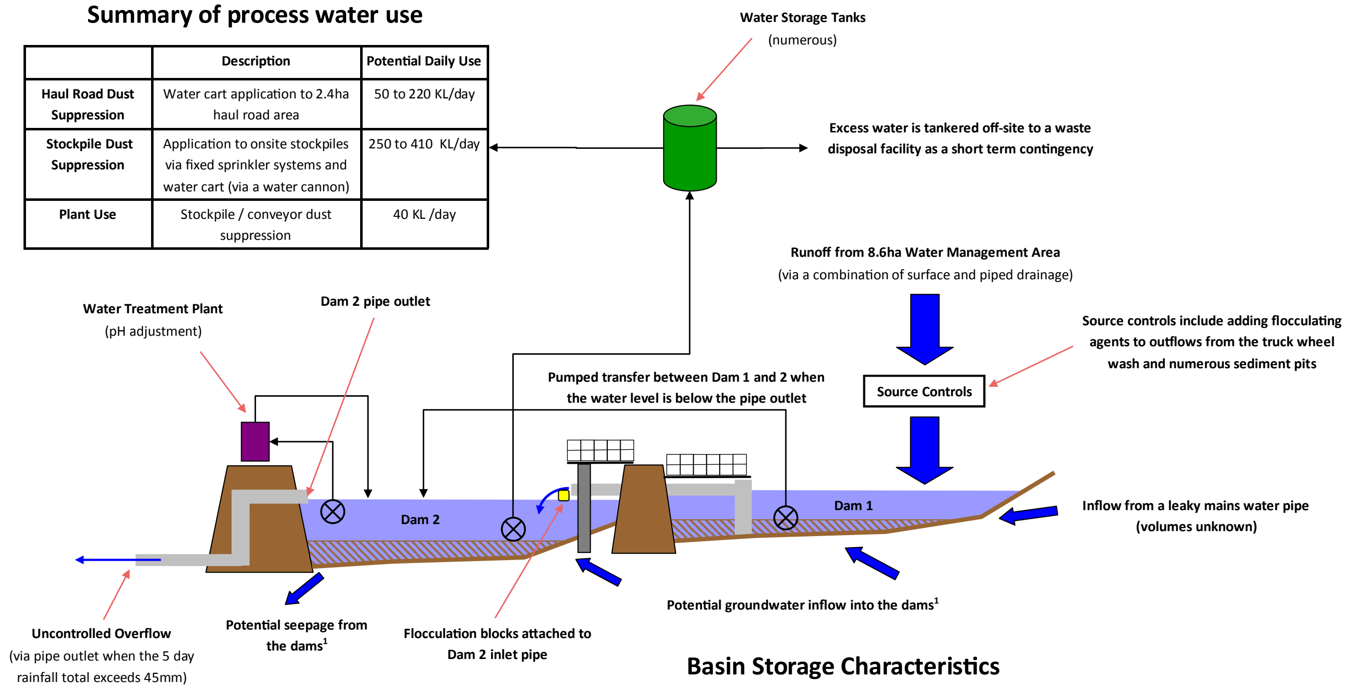
Overview of the Facility's Surface Water Management System

The figure on the following page diagrammatically describes the functionality of the facility's existing water management system. Site overflows occur from Dam 2 when the water level in Dam 2 exceeds the invert level of the outlet pipe. **Section 3** of this report provides further information on the facility's existing water management system.

Existing Surface Water Regime

Summary of process water use

	Description	Potential Daily Use
Haul Road Dust Suppression	Water cart application to 2.4ha haul road area	50 to 220 KL/day
Stockpile Dust Suppression	Application to onsite stockpiles via fixed sprinkler systems and water cart (via a water cannon)	250 to 410 KL/day
Plant Use	Stockpile / conveyor dust suppression	40 KL /day



Note 1: Boral will provide further information on potential groundwater interaction with Dams 1 and 2 in a separate document

Basin Storage Characteristics

	Dam 1	Dam 2	Combined
Sediment Storage (KL)	730	641	1,371
Water Storage (KL)	757	1,098	1,855
Total (KL)	1,487	1,739	3,226

Volumes calculated from detailed topographic survey

🟦	**Water Storage** (storage volume between pump intake levels and the outlet pipe invert)
▨	**Sediment Storage** (storage volume below the pump intake level, reserved for the storage of accumulated sediment)

Overview of Receiving Water

Overflows from the facility enter Prospect Creek, immediately upstream of the Widemere Road Bridge. The Prospect Creek Catchment area (upstream of the bridge) is estimated to be 1,036 ha. Accordingly, the facility's 8.6ha Water Management Area forms 0.8% of the contributing catchment area at the site overflow location. Aerial imagery indicates that land uses within the catchment comprise a mixture of vegetated areas (40%), industrial areas (50%) and urban areas (10%). The creek channel and riparian zones have been highly modified, with significant reaches of concrete lined channel established. Due to these significant modifications to the catchment and watercourse, Prospect Creek is considered to be a highly disturbed watercourse.

Overview of SWCA

The SWCA was submitted to the EPA on 5 April 2017.The SWCA was informed by 9 surface water sampling events that were undertaken between 14 December 2016 and 23 March 2017. 6 of the 9 sampling events were undertaken during wet weather conditions. Most samples were tested for a comprehensive suite of over 400 analytes. Trigger values were established by Victory Engineering for each detected contaminant using the methods documented in the ANZECC (2000) Guidelines for slightly-to-moderately disturbed ecosystems. These trigger values provide a conservative reference for water quality that is unlikely to cause environmental harm to a slightly-to-moderately disturbed watercourse.

All water quality results in Dam 2 were compared to the trigger values to identify analytes of concern. This process identified the following analytes that exceeded trigger values (by varying amounts) in Dam 2 on at least one occasion:

- pH
- Suspended Solids.
- Nutrients (Total Phosphorous, Total Nitrogen, Ammonia and Nitrate (NOx).
- Dissolved Metals (Al, Ba, Cr (VI), Cu, Sr, Va and Hexavalent Chromium).
- Fluoride, Cyanide and Chlorine.
- Phenolics (2-Methylphenol, 3&4-methylphenol and 2,4-Dimethylphenol).
- Carbendazim and Anionic Surfactants.

Refer to **Section 4** for a summary of the SWCA and key water quality results.

Water Balance Model Development and Calibration

A site water balance model of the facility’s water management system was developed and calibrated. The model was applied to assess the adequacy of the existing system and potential benefits associated with a range of water management system improvement options. The water balance model results indicate that:

- Broadly the water management system complies with EPL Condition L1.2, which permits overflows when the 5 day rainfall total exceeds 45mm.
- Uncontrolled overflow volumes are equivalent to 32% of the total runoff volume. Data from two overflow events that occurred during the calibration period has demonstrated that overflows occur during significant wet weather events, when substantial flows in Prospect Creek would be occurring.

Assessment of Potential Receiving Water Impacts

An assessment of the facility’s potential to impact receiving water quality is documented in **Section 5.4** of this report. The assessment concluded that:

- The facility’s 8.6 ha Water Management Area is equivalent to only 0.8% of the contributing Prospect Creek Catchment area at the facility’s overflow location. By virtue of dilution, it is expected that any overflows from the facility will not materially alter the water quality in Prospect Creek during wet weather. However, it is acknowledged that overflows from the site are likely to contribute to the cumulative degradation of water quality in Prospect Creek during wet weather conditions.
- Potential for impacts to Prospect Creek water quality would increase if Dam 2 water is discharged outside of significant wet weather periods (i.e. via controlled discharges). Controlled discharges are currently not permitted by EPL (Condition U1) and no controlled discharges occurred over the monitoring period.

Assessment of Options

RHDHV, Boral and Victory Engineering reviewed the potential benefits of a wide range of water quality improvement options. This review process identified 6 options for further assessment. These options are summarised in the following table.

Option	Description	Water Management Benefits
Option 1	Divert clean water runoff from vegetated batters located to the north of site but within the 8.6 ha Water Management Area.	Reduce runoff volumes to the dams, reducing the frequency and magnitude of overflows.
Option 2	Fix leaky water main to reduce inflows into Dam 1	Reduce base flow to the dams, reducing the frequency and magnitude of overflows.
Option 3	Options 1 and 2 combined.	Reduce runoff volumes and base flows to the dams, reducing the frequency and magnitude of overflows.
Option 4	Apply process water on Sundays and public holidays during wet weather.	Increases to process water use will reduce the frequency and magnitude of overflows.
Option 5	Upgrade the existing dams to increase storage and water quality treatment potential.	Increased storage is expected to: • Reduce the frequency and magnitude of overflows by increasing the opportunity for water to be used as process water. • Improve the treatment of overflows due to increased residence time.
Option 6	• Upgrade the existing dams to increase storage and water quality treatment potential. • Install a water treatment plant that is designed to progressively dewater the dams. Treated water would be discharged as Controlled Discharge under a modified EPL.	These measures combined are expected to: • Reduce the frequency and magnitude of overflows by progressively dewatering the dam. • Improve the treatment of overflows due to increased residence time.

The water balance model was applied to assess the benefits of each option. Refer to **Section 7** for detailed results and discussion.

Proposed Water Management Improvement Plan

The following table itemises Boral's proposed water management improvement plan.

Action	Objective	Timing[1]
Phase 1 – Near Term Actions		
A1.1 – Implement Option 1 (clean water diversion).	Reduce receiving water quality risks.	Within 3 months
A1.2 – Implement Option 2 (fix leaky water main) if possible.	Reduce receiving water quality risks.	Within 3 months
A1.3 – Investigate and implement measures to reduce the risk of human exposure to airborne pathogens associated with process water use.	Reduce the risks of human exposure to airborne pathogens associated with process water use.	Within 3 months
A1.4 – Continue to collect data for water balance calibration.	To inform future water balance calibration and verification.	Ongoing
A1.5 – Implement the surface water monitoring plan that is described in **Section 9**.	To monitor the effectiveness of the water management system.	Immediately
Phase 2 – Medium Term Actions		
A2.1 – Recalibrate the water balance using 6 months of data and verify the outcomes of this report.	To improve confidence in the water balance outcomes prior to Boral making a significant investment in stormwater management infrastructure upgrades.	Within 6 months
A2.2 – Prepare preliminary civil designs for the preferred Dam 1 and 2 upgrade concept.	To provide reliable information on the key characteristics of an upgraded water management dam.	Within 6 months
A2.3 – Update this SWMMP to reflect the outcomes of A2.1 and A2.2.	To update the plan to reflect the outcomes of the water balance calibration and civil design.	Within 6 months
A2.4 – Recommend amendments to EPL and Consent Conditions.	To revise EPL and consent conditions to reflect the final SWMMP.	Within 6 months
Phase 3 – Long Term Actions		
A3.1[1] – Complete upgrades to Dams 1 and 2.	Reduce receiving water quality risks.	Within 1 year

Note 1: Action A3.1 is subject to favourable outcomes from A2.1, A2.2 and A2.3.

Note 2: Timeframes are from government acceptance of the outcomes of this SWMMP.

The proposed works, once fully implemented, are expected to reduce overflow volumes by 58%. Substantial improvements to the water quality treatment function of the dams during overflow conditions are also expected due to increased residence time and general improvements to the dam design. Accordingly, the proposed works are expected to significantly reduce receiving water quality risks. It is also noted that no controlled discharge arrangement is proposed.

Proposed Surface Water Monitoring Plan

Boral propose to implement a surface water monitoring plan that includes:

- Monitoring of site rainfall.
- Monitoring of dam water levels and overflows.
- Monitoring of daily process water use volumes.
- Water quality monitoring during overflow conditions.

The objective of the monitoring plan is to collect data to enable:

- The occurrence, duration and volume of site overflows to be estimated.
- The quality of surface water during overflow conditions to be characterised.
- The site water balance model to be progressively updated (as required).
- Compliance with EPL and consent conditions to be assessed.

Refer to **Section 9** for detailed information on the proposed surface water monitoring program.

TERMINOLOGY

Assessment Model	*Refers to a water balance model that was developed to assess the effectiveness of the both the existing water management system and potential improvement options.*
Calibration Model	*Refers to a water balance model that was developed to calibrate key water balance parameters.*
Controlled Discharge or Discharge	*Refers to managed outflows from the water management basins that occur via pumping or a controlled release of water.*
Discharge Coefficient (C_D)	*Refers to the percentage of runoff volume that is discharged from the facility via a controlled discharge arrangement over a given period.*
Overflow Coefficient (C_{OF})	*Refers to the percentage of runoff volume that overflows from the facility over a given period.*
Process Water	*Refers to water that is harvested from the facility's water management dams for on-site dust suppression.*
Residence Time	*Refers to the average amount of time a given volume of water stays in a water treatment storage between inflow and outflow. Water quality improvement potential generally improves with greater residence time.*
Runoff Coefficient (C_v)	*Refers to the runoff volume expressed as a percentage or fraction of rainfall volume over a given period.*
Specific Retention (S_r),	A term used to defines the ratio of the volume of water a material can retain against gravity to the total volume of the material
Uncontrolled Overflows or Overflows	*Refers to water that spills from the water management basins when the basin level exceeds the invert level of the outlet pipe.*
Water Management Area	*Refers to an 8.6 ha area that contributes runoff to the facility's water management basins.*

ABBREVIATIONS

AHD	*Australian Height Datum*
ALS	*Australian Laboratory Services*
ANZECC	*Australian and New Zealand Guidelines for Fresh and Marine Water Quality*
BoM	*Bureau of Meteorology*
Boral	*Boral Recycling Pty Limited*
C_v	*Volumetric Runoff Coefficient (refer to terminology for definition)*
C_{OF}	*Volumetric overflow Coefficient (refer to terminology for definition)*
C_D	*Volumetric Controlled Discharge Coefficient (refer to terminology for definition)*
DGB	*A road base specification*
EMC	*Event Mean Concentration*
EMM	*EMM Consulting Pty Limited*
EPA	*NSW Environment Protection Authority*
EPL	*Environmental Protection License*
IEAust	*Institution of Engineers Australia*
LOR	*Limit of Reporting*
ML	*Megalitre*
PRP	*Pollution Reduction Program*
S_r	Specific Retention *(refer to terminology for definition)*
SWCA	*Surface Water Characterisation Assessment*
SWMMP	*Surface Water Monitoring and Mitigation Plan*
RHDHV	*Royal HaskoningDHV*
The Facility	*Boral Widemere Materials Recycling Facility*
UGB	*A road base specification*

1 INTRODUCTION

Boral Recycling Pty Limited (Boral) operates the Widemere Recycling Facility (the facility), at Wetherill Park in the Fairfield Local Government Area. The site location is shown in **Figure 1**. The facility accepts construction and demolition waste, which is separated and crushed onsite before blending with quarry materials to produce saleable construction materials.

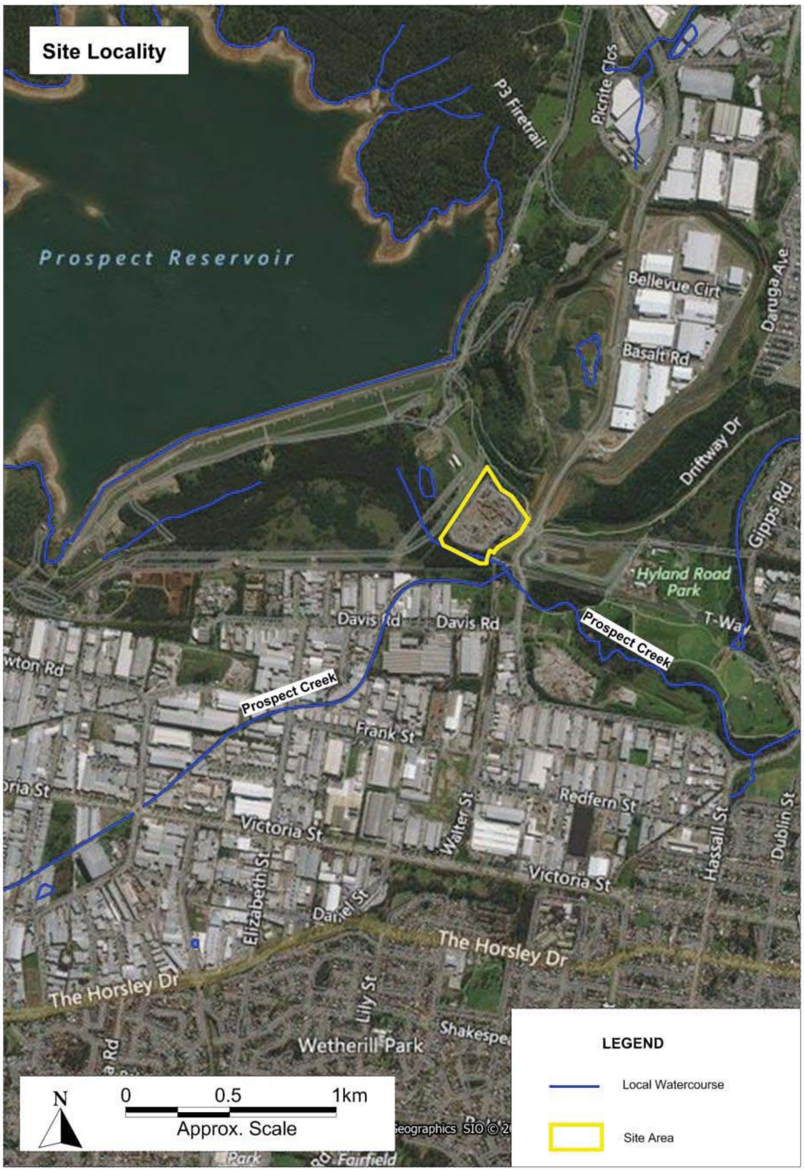


Figure 1 – Site Locality

On 25 November 2016, Boral received conditional consent to increase the processing capacity of the facility to 1,000,000 tonnes per annum (tpa) (Consent SD 6525). The consent included 27 consent conditions associated with site water management. In addition to the consent conditions, the NSW Environmental Protection Authority (EPA) modified the facility's Environmental Protection Licence (EPL no.11815). The modified EPL included a Pollution Reduction Program (PRP). The Operational Environmental Management Plan, of which this SWMMP is a sub-plan, covers the entire Development and applies to a processing capacity at the facility of up to 1,000,000 tonnes per annum (tpa).

Collectively, the development consent conditions and the modified EPL require Boral to prepare the following water management related documents:

- **Surface Water Characterisation Assessment (SWCA):** This document was issued to the EPA on 5 April 2017. The SWCA was informed by surface water monitoring and characterised the surface water quality within the facility's water management dams.

- **Surface Water Monitoring and Mitigation Plan (SWMMP):** This document will include:

    - A holistic review of the existing water management system. This review will be informed by the outcomes of the SWCA and a calibrated a water balance model of the facility's water management system.

    - An assessment of the effectiveness and benefits of a range of water management improvement options. This options assessment exercise will be used to justify any proposed changes to the existing water management system.

    - A proposed surface water monitoring program.

- **Surface Water Validation and Audit Reports:** These documents will be prepared following the implementation of any approved changes to the facility's water management system. These documents will be informed by water quality and level data and will assess the effectiveness of the implemented surface water management system in complying with development consent and EPL conditions.

This document addresses the SWMMP that is required under EPL Condition U1 and Consent Condition 41.

1.1 Report Overview

This report documents the SWMMP. The report is structured as follows:

- **Section 2** discusses the framework of the SWMMP.
- **Section 3** describes the existing surface water management system.
- **Section 4** summarises the SWCA (RHDHV, 2017).
- **Section 5** describes the water balance model development and calibration.
- **Section 6** reviews the existing water management system.
- **Section 7** reviews potential water management system improvements.
- **Section 8** details Boral's proposed water management system improvement plan.
- **Section 9** details of the proposed surface water monitoring and contingency plans.

1.2 Acknowledgements

This report has been prepared by Royal HaskoningDHV (RHDHV) with the following input from Victory Engineering, EMM Consulting (EMM) and Boral:

- Victory Engineering supervised the execution of the water quality sampling program and collated and analysed all results. They also established trigger values for detected analytes that are reported in the SWCA (RHDHV, 2017). Victory Engineering also provided process water treatment advice.

- EMM installed water level loggers in Dams 1 and 2 and were responsible for downloading and processing the data.

- Boral collected most water quality samples and kept records of site water use over the calibration period.

2 ASSESSMENT FRAMEWORK

This SWMMP is required as part of the PRP that is specified in EPL 11815, Condition U1 and Consent Condition 41. This section reproduces the relevant EPL and Consent Conditions and provides information on how each requirement has been addressed by Boral.

2.1 EPL Conditions

Table 2-1 reproduces relevant EPL conditions and provides information on how each requirement has been or will be addressed by Boral.

Table 2-1 *– Summary of relevant EPL conditions.*

EPL Condition	Requirement	How has this requirement been addressed by Boral
Limit Conditions		
L1.1	Except as may be expressly provided in any other condition of this licence, the licensee must comply with Section 120 of the Protection of the Environment Operations Act 1997.	Model results presented in **Section 6** indicate that the facility is currently operating within EPL conditions. Boral proposes to implement a number of water management system improvements which will reduce the facility's water quality risks to receiving waters and the risk of non-compliance with EPL conditions.
L1.2	Discharge of water from Dam 2 is permitted when the discharge occurs solely as a result of rainfall at the premises exceeding a total of 45 mm over any consecutive five day period.	Model results presented in **Section 6** indicate that the facility is currently operating within this EPL condition. Boral proposes to implement a number of water management system improvements which will reduce the risk of non-compliance with this EPL condition.
L2.1 to 2.4 and L3.1	Relate to Controlled Discharge conditions which are superseded by Condition U1.1, which prohibits Controlled Discharge.	Model results presented in **Section 6** indicate that the facility is currently operating within this EPL condition without the need for a Controlled Discharge arrangement. Accordingly, Boral recommends that the EPL is modified to remove any reference to Controlled Discharge.
Monitoring Conditions		
M2.3	Monitoring of Oil and Grease, pH, Total Suspended Solids and Turbidity is required daily during any discharge.	A surface water monitoring program is detailed in **Section 9**. This program exceeds the minimum EPL conditions.
PRP Conditions		
U1.1	No Controlled Discharge of water is permitted from the Premises until water quality levels stabilise and monitoring results are provided to the EPA. Any excess water captured on the Premises must be disposed of at a facility that can lawfully receive that type of waste. Recommencement of Controlled Discharge from the Premises must be approved in writing by the EPA.	Model results presented in **Section 6** indicate that the facility is currently operating within this EPL condition without the need for a Controlled Discharge arrangement. Accordingly, Boral recommends that the EPL is modified to remove any reference to Controlled Discharge.

EPL Condition	Requirement	How has this requirement been addressed by Boral
U1.2 to 1.4	Relate to the SWCA that has been submitted to the EPA on 5 April 2017.	The SWCA was submitted to the EPA on 5 April 2017. At the time of writing this SWMMP, the EPA has not provided any feedback.
U1.5	The Licensee must engage a suitably qualified and experienced person to prepare a SWMMP.	Boral have engaged RHDHV to prepare this SWMMP.
U1.6	The SWMMP must be submitted to the EPA by 28 April 2017.	Boral propose to submit this SWMMP to the EPA on 28 April 2017.
U1.7	The SWMMP must include, at a minimum:	
U1.7 a)	a) An investigation of practical measures that could be taken to avoid or minimise pollution based on the SWCA (U1.4). Consideration should include but not be limited to at-source controls, reducing runoff volumes, treatment options and alternative storage requirements.	**Section 7** reviews potential mitigation measures and selects and justifies a preferred suite of water management improvement works.
U1.7 b)	b) Justification for rejecting options assessed at U1.7a	**Section 7** reviews potential mitigation measures and selects and justifies a preferred suite of water management improvement works.
U1.7 c)	c) Development of a program of preferred measures with proposed timeframes for implementation.	**Section 7** reviews potential mitigation measures and selects and justifies a preferred suite of water management improvement works. **Section 8** provides an implementation schedule for the proposed works program.
U1.7 d)	d) In the context of the proposed mitigation measures at U1.7c, a review of the water balance must be undertaken to determine appropriate detention and discharge volumes for Controlled Discharge based on the level of water pollution risk. This review must take into account that the current Controlled Discharge regime is based on uncontaminated discharge quality and is therefore inappropriate.	**Section 5** documents the development and calibration of a site water balance model. The model was applied to assess compliance with EPL conditions. **Section 6.2** applies the water balance results and the outcomes of the SWCA to establish potential water quality risks to receiving waters.
U1.7 e)	e) Establish an ongoing runoff and discharge monitoring program to validate outcomes of the proposed mitigation measures. The program must include at a minimum: i. Identification of pollutants to be monitored based on the SWCA. ii. Identification of appropriate trigger values for pollutants and proposed action and mitigation measures for managing pollutant exceedances. iii. Monitoring of rainfall. iv. Monitoring of discharge frequency and volumes. v. Location of monitoring points.	A surface water monitoring program is detailed in **Section 9**. This program addresses each of the monitoring requirements listed in this EPL Condition.

EPL Condition	Requirement	How has this requirement been addressed by Boral
	vi. Frequency of monitoring; and vii. Method of monitoring.	
U1.8	Contingency options must be developed and included in the SWMMP to account for any mitigation options that do not adequately address the site water pollution risks.	Contingency options are provided in **Section 9**.
U1.9	The SWMMP must be approved in writing by the EPA prior to implementation. Appropriate concentration discharge limits, volume discharge limits and ongoing monitoring requirements will be placed as conditions of the Licence and the EPA will consider if addition performance criteria will require licence conditions.	Boral will wait for feedback from the EPA before implementing any of the proposed water management system improvement works that are documented in **Section 8**.

2.2 Consent Conditions

Table 2-2 reproduces relevant Consent Conditions that are addressed in this SWMMP and provides information on how each condition has been or will be addressed by Boral.

***Table 2-2** – Summary of relevant Consent Conditions.*

Consent Condition	Requirement	How has this requirement been addressed by Boral
Soil and Water		
CC 22	The Development shall comply with Section 120 of the POEO Act, which prohibits the pollution of waters, except as expressly provided in an EPL.	Model results presented in **Section 6** indicate that the facility is currently operating within EPL conditions. Boral proposes to implement a number of water management system improvements which will reduce the facility’s water quality risks to receiving waters and the risk of non-compliance with EPL conditions.
CC 23	Any discharge or water quality criteria specified under the EPL must be complied with	Model results presented in **Section 6** indicate that the facility is currently operating within EPL conditions. Boral proposes to implement a number of water management system improvements which will reduce the facility’s water quality risks to receiving waters and the risk of non-compliance with EPL conditions.
CC 24	Surface water must only be discharged from the location specified in the EPL.	Under both existing and proposed conditions, surface water overflows from the water management system occur from the Dam 2 outlet pipe, which is the designated overflow location in the EPL.

Consent Condition	Requirement	How has this requirement been addressed by Boral
CC 25	Discharges of turbidity and/or suspended solids to water from the discharge point identified in the EPL is only permitted when the discharge occurs solely as a result of rainfall at the premises exceeding a total of 45mm over any consecutive 5-day period.	Model results presented in **Section 6** indicate that the facility is currently operating within this EPL conditions. Boral proposes to implement a number of water management system improvements which will reduce the risk of non-compliance with this EPL condition.
CC 26	The Application shall undertake water quality monitoring at the discharge point in accordance with the monitoring requirements described under this consent and the EPL.	A surface water monitoring program is detailed in **Section 9**. This program addresses each of the monitoring requirements listed in EPL Condition U1.7e).
Erosion and Sediment Control		
CC 28	All construction vehicles exiting the site, having had access to unpaved areas, shall depart via a wheel-wash facility.	Boral currently operate an automated truck wheel wash facility that washes the tyres of all outgoing vehicles.
CC 29	The Applicant shall implement erosion and sediment control measurers during construction in accordance with Landcom's Managing Urban Stormwater: Soils and Construction Guideline.	Boral will prepare erosion and sedimentation control plans for any construction works that occur outside of the facility's water management area.
Bunding		
CC 30	The Applicant shall store all chemicals, fuels and oils used on-site in appropriately bunded storage areas in accordance with the requirements of all relevant Australian Standard and the EPA's Storing and Handling Liquids: Environmental Protection: Participants Manual 2007.	Boral have advised that all chemicals, fuels and oils are stored in accordance with relevant bunding guidelines.
Site Drainage and Surface Water Management		
CC 31	Within six months of the expanded operations, the Applicant shall provide certification from a suitably qualified engineer that the internal surfaces of the water management basins have been maintained to the equivalent, or better than, a clay liner with a permeability of 1 x 10^{-9} m/s or less and a thickness of no less than 900 mm and whether any repairs are necessary The documentation of the certification shall be provided to the EPA an Secretary.	Boral propose to upgrade the water management dams. As a result this condition is not relevant. The proposed dam embankments will be designed and constructed to water holding specifications as required by relevant Australian Standards.
CC 32	Should the certification as per Condition CC 31 identify that repairs are required, these repairs shall be carried out within two months of the certification.	Boral propose to upgrade the water management dams. **Section 8** provides an implementation schedule for the proposed works programme.

Consent Condition	Requirement	How has this requirement been addressed by Boral
CC 33	The Applicant shall maintain all surface water infrastructure to direct all surface water runoff to the site's surface water management dams.	Boral has advised that the existing site drainage infrastructure directs all runoff from the facility's 8.6ha water management area to the water management dams. Boral will continue to maintain this infrastructure in good working conditions.
CC 34	Only water contained in Dam 2 is permitted to be applied to land and stockpiles within the site. Spray from the application of this water must not drift beyond the boundary of the area to which it is applied.	Process water is sourced from Dam 2 only. Process water is used for haul road, stockpile and conveyor dust suppression. All water use is within the boundary of the facility Water Management Area.
CC 35	The Application shall maintain the surface water management dams on site with a minimum capacity to contain all runoff from 45 mm of rainfall over any consecutive 5 day period. The capacity requirements of the sediment basins may be modified by the EPL.	The water management dams are managed to minimise the frequency and magnitude of site overflows.
CC 36	The Application shall ensure that a visible marker is installed in each sediment basin in a position that shows the freeboard in the basin that equates to the volume required to contain all runoff from 45 mm of rainfall over any consecutive 5 day period. The capacity requirements of the sediment basins may be modified by the EPL.	Boral has advised that visible markers are installed that indicate the 5 day 45mm rainfall runoff volume. Markers will be provided in any dam upgrade.
CC 37	The sediment basin liner shall be monitored every 3 years to ensure a clay liner of permeability of 1 x 10^{-9} m/s or less and thickness of no less than 900 mm is maintained.	Boral may propose an alternative method to verify the basin's water holding functionality. Further details will be provided when the engineering design of any dam upgrades are completed.
Surface Water Mitigation and Monitoring Plan		
CC 41	Prior to any controlled discharges permitted under the EPL the Applicant must provide a SWMMP, the plan must:	
	a) Be prepared by a suitably qualified and experience expert.	Boral have engaged RHDHV to prepare this SWMMP.
	b) Be approved by the Secretary in consultation with the EPA;	Boral will wait for feedback from the EPA and Secretary before implementing any of the proposed water management system improvement works that are documented in **Section 8**.
	c) Provide a description and map of the surface water processes and surface water management infrastructure;	The existing surface water management system is described in **Section 3.1**.
	d) Outline the measures to control and manage surface water (including erosion and sedimentation) associated with the Development;	The existing surface water management system is described in **Section 3.1**.

Consent Condition	Requirement	How has this requirement been addressed by Boral
	e) Detail how water used for dust suppression will be manged to ensure excessive run-off is not generated at the site;	The water balance model calibration that is documented in **Section 5** considered the potential for some applied process water to return to the water management system.
	f) Consider the human health risks associated with the surface water reuse process at the site;	Boral will investigate and implement measures to reduce the risk of human exposure to airborne pathogens associated with process water use.
	g) Include details of the maintenance procedures of the sediment basins and surface water infrastructure;	A maintenance plan is provided in **Section 9**. The maintenance plan will be updated when the water management basins are upgraded.
	h) Describe the procedures for maintaining vegetation along surface water channels and detention systems, to minimise the potential for erosion.	Vegetation is not typically maintained within on-site surface drains. Vegetation would increase the rate of sediment accumulation within the drains, increasing the risk of drain blockages.
	i) Provide details and outcomes of the water balance review and water quality characterisation as required by the EPL.	**Section 6.2** applies the water balance results and the outcomes of the SWCA to establish potential water quality risks to receiving waters.
	j) Identify and justify practical measures that could be deployed at the site minimise water pollution;	**Section 7** reviews potential mitigation measures and selects and justifies a preferred suite of water management improvement works. **Section 8** provides an implementation schedule for the proposed works program.
	k) Identify preferred mitigation measures along with timeframes for implementation	**Section 7** reviews potential mitigation measures and selects and justifies a preferred suite of water management improvement works. **Section 8** provides an implementation schedule for the proposed works programme.
	l) Establish an ongoing runoff discharge monitoring program to validate the proposed mitigation measures	A surface water monitoring program is detailed in **Section 9**. This program addresses each of the monitoring requirements listed in EPL Condition U1.7e).
	m) Identify measures for managing pollutant exceedances.	**Section 7** reviews potential mitigation measures and selects and justifies a preferred suite of water management improvement works.

Consent Condition	Requirement	How has this requirement been addressed by Boral
	n) Identify contingency options to account for any mitigation measures that do not adequately address the site water pollution risks	Contingency options are provided in **Section 9**.
	o) Include a review and justify the flocculants and coagulants used on-site; and	Flocculating agents are applied to outflows from the truck wheel wash. Inflows into Dam 2 also spill over a rack of flocculating blocks. Boral use the Damclear flocculent which has been previously endorsed by the EPA.
	p) Conduct a review of the methods and chemicals used for pH adjustment in the sediment basin.	Water is currently pumped from Dam 2 and treated in a water management plant that adjusts pH. This system will be reviewed when the dam upgrades are investigated.
CC 42	The Application shall carry out the Development in accordance with the Surface Water Mitigation and Monitoring Plan (including the implementation of mitigation measures) approved by the Secretary (as revised and approved by the Secretary from time to time), unless otherwise agreed by the Secretary.	Following approval in writing from the Secretary and the EPA, Boral will implement the proposed works program that is documented in **Section 8.**

3 EXISTING SURFACE WATER ENVIRONMENT

This section provides a description of the existing surface water environment in the vicinity of the facility and is structured as follows:

- **Section 3.1** reviews climatic data.
- **Section 3.2** describes the existing surface water management system.
- **Section 3.3** describes local watercourses.

3.1 Climatic Data

This section reviews available climatic information and establishes representative climatic databases for the facility.

3.1.1 Rainfall Records

There are a number of Bureau of Meteorology (BoM) operated rainfall gauges that provide rainfall records in the vicinity of the facility. Rainfall records from three local gauges were selected for analysis. **Figure 2** locates the BoM rainfall gauges.

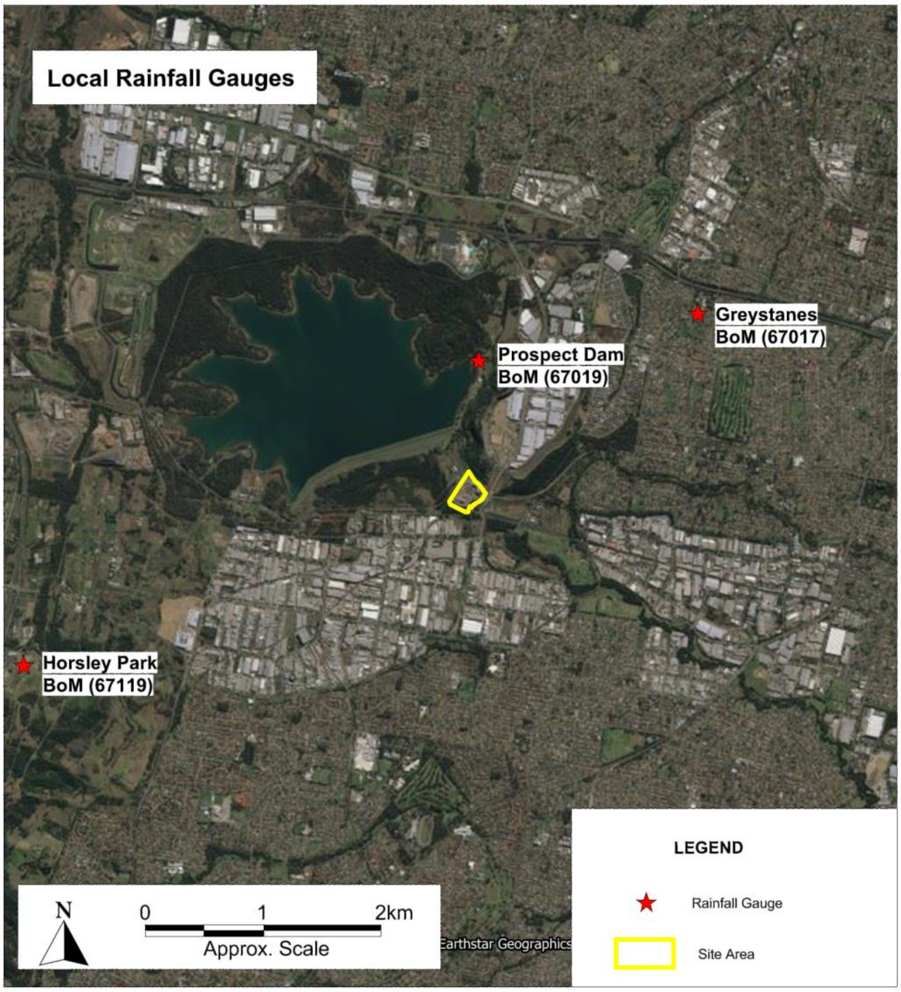


Figure 2 – *Local Rainfall Gauges*

Table 3-1 presents key information and statistical data from the three BoM gauges shown in **Figure 2**.

Table 3-1 – *Rainfall Statistics from Local Gauges*

Statistics	Prospect Dam (67019)	Greystanes (67017)	Horsley Park (67119)
Rainfall Record	1887 to present	2001 to present	1997 to present
Distance from facility	1.5km to the north	3.2km to the north-east	5.3km to the south-west
Elevation (m AHD)	61	70	100
Average Rainfall (mm/year)	875	864	769
Lowest Annual Rainfall (mm/year)	395	614	378
5th Percentile Rainfall (mm/year)	521	640	473
10th Percentile Rainfall (mm/year)	573	667	560
Median Rainfall (mm/year)	863	885	734
90th Percentile Rainfall (mm/year)	1178	1015	993
95th Percentile Rainfall (mm/year)	1316	1060	1068
Highest Annual Rainfall (mm/year)	1900	1105	1071

Source: Bureau of Meteorology

Data presented in **Table 3-1** indicates that there is some spatial variability in the regional rainfall, with average annual rainfall totals ranging from 769 mm/year (BoM 67119) to 875 mm/year (BoM 67019). The record from the Prospect Dam (BoM 67019) gauge is considered to be the most representative data for the facility due the gauge's proximity to the facility and length of record. Accordingly, data from this gauge has been applied to water balance modelling that was undertaken to inform the SWMMP.

Figure 3 plots the average and 10th and 90th Percentile monthly rainfall depths calculated (by BoM) from the Prospect Dam (BoM 67019) record. The chart clearly demonstrates the high variability in monthly rainfall across all seasons.

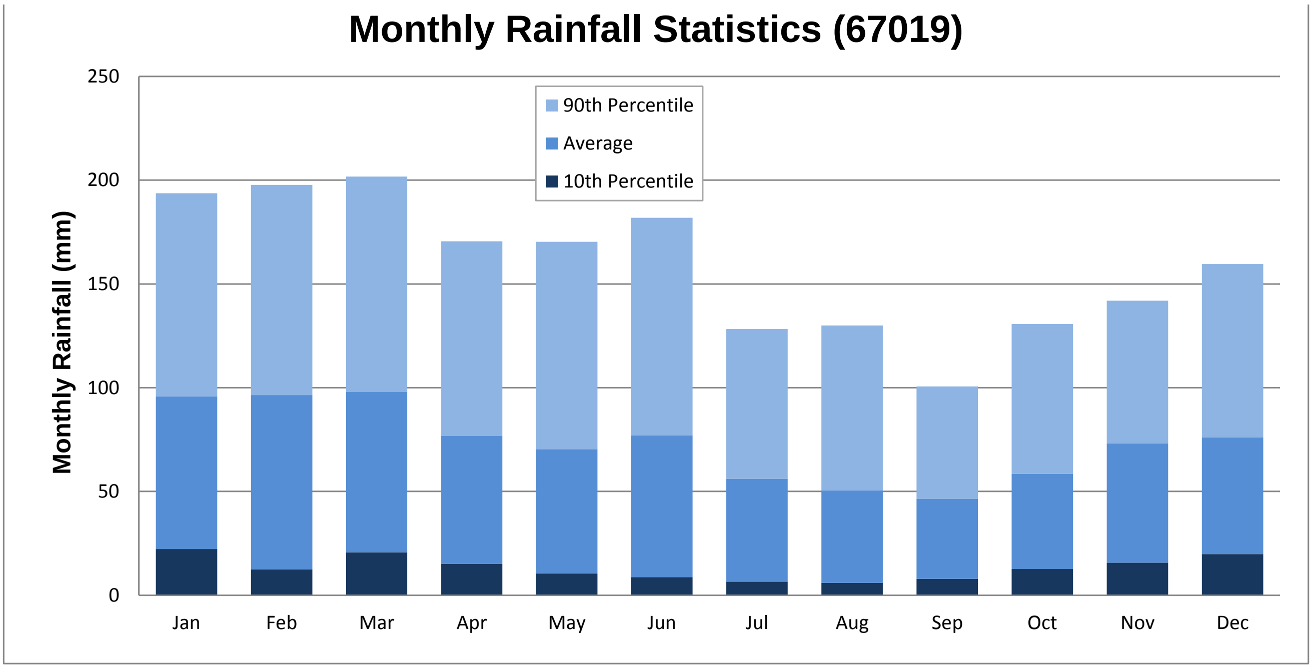


Figure 3 – *Monthly Rainfall Statistics at Prospect Dam (67019)*

3.1.2 Evaporation Data

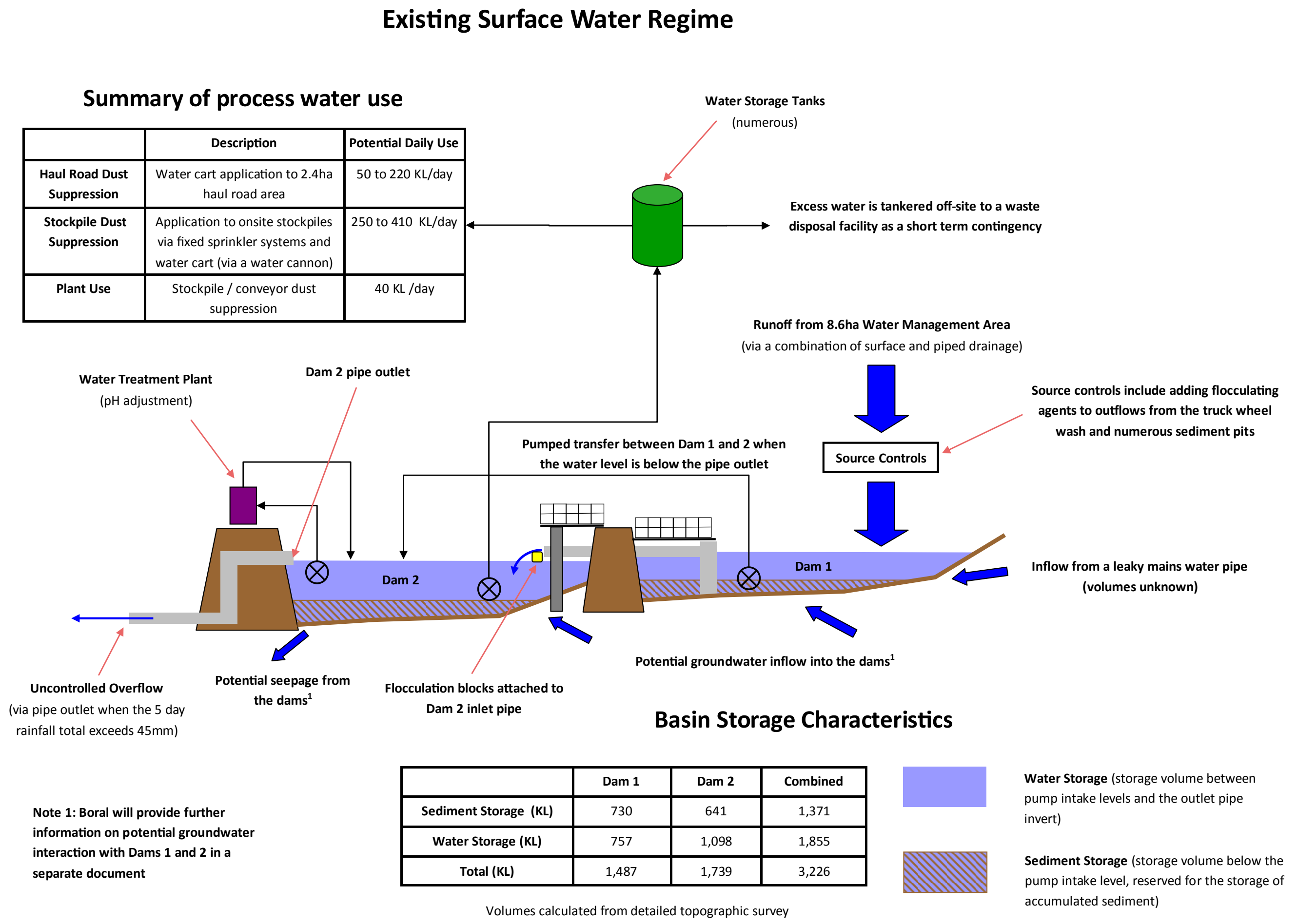
Table 3-2 presents the average monthly pan evaporation and Areal Potential Evaporation (PET) rates at the facility. This information was extracted from the monthly climate maps provided by the BoM and indicates that the pan evaporation rate is nearly double the average annual rainfall depth.

Table 3-2 - *Average Monthly Evaporation and PET data*

Month	Average Monthly Pan Evaporation	Average Areal Potential Evapotranspiration
	(mm/month)	(mm/month)
January	191	161
February	154	121
March	137	108
April	100	73
May	70	49
June	58	37
July	64	38
August	93	55
September	122	72
October	156	115
November	167	137
December	198	146
Annual	**1510**	**1112**

3.2 Existing Water Management System

This section describes the existing water management system and should be read in conjunction with **Figure 4**, which diagrammatically describes the system's functionality. The following sections provide further information on the catchment areas, water quality controls, process water uses and site overflow locations.



Summary of process water use

	Description	Potential Daily Use
Haul Road Dust Suppression	Water cart application to 2.4ha haul road area	50 to 220 KL/day
Stockpile Dust Suppression	Application to onsite stockpiles via fixed sprinkler systems and water cart (via a water cannon)	250 to 410 KL/day
Plant Use	Stockpile / conveyor dust suppression	40 KL /day

Basin Storage Characteristics

	Dam 1	Dam 2	Combined
Sediment Storage (KL)	730	641	1,371
Water Storage (KL)	757	1,098	1,855
Total (KL)	1,487	1,739	3,226

Volumes calculated from detailed topographic survey

Note 1: Boral will provide further information on potential groundwater interaction with Dams 1 and 2 in a separate document

Figure 4 – *Existing Water Management System*

3.2.1 Water Management Area

The water management system receives runoff from an 8.6 ha Water Management Area. Runoff from this area drains to a sedimentation basin (referred to as Dam 1) via a combination of piped and surface drainage. Dam 1 overflows into a second sedimentation basin (referred to as Dam 2). **Figure 5** shows a site drainage plan that depicts the extent of the Water Management Area and location of stormwater management infrastructure.

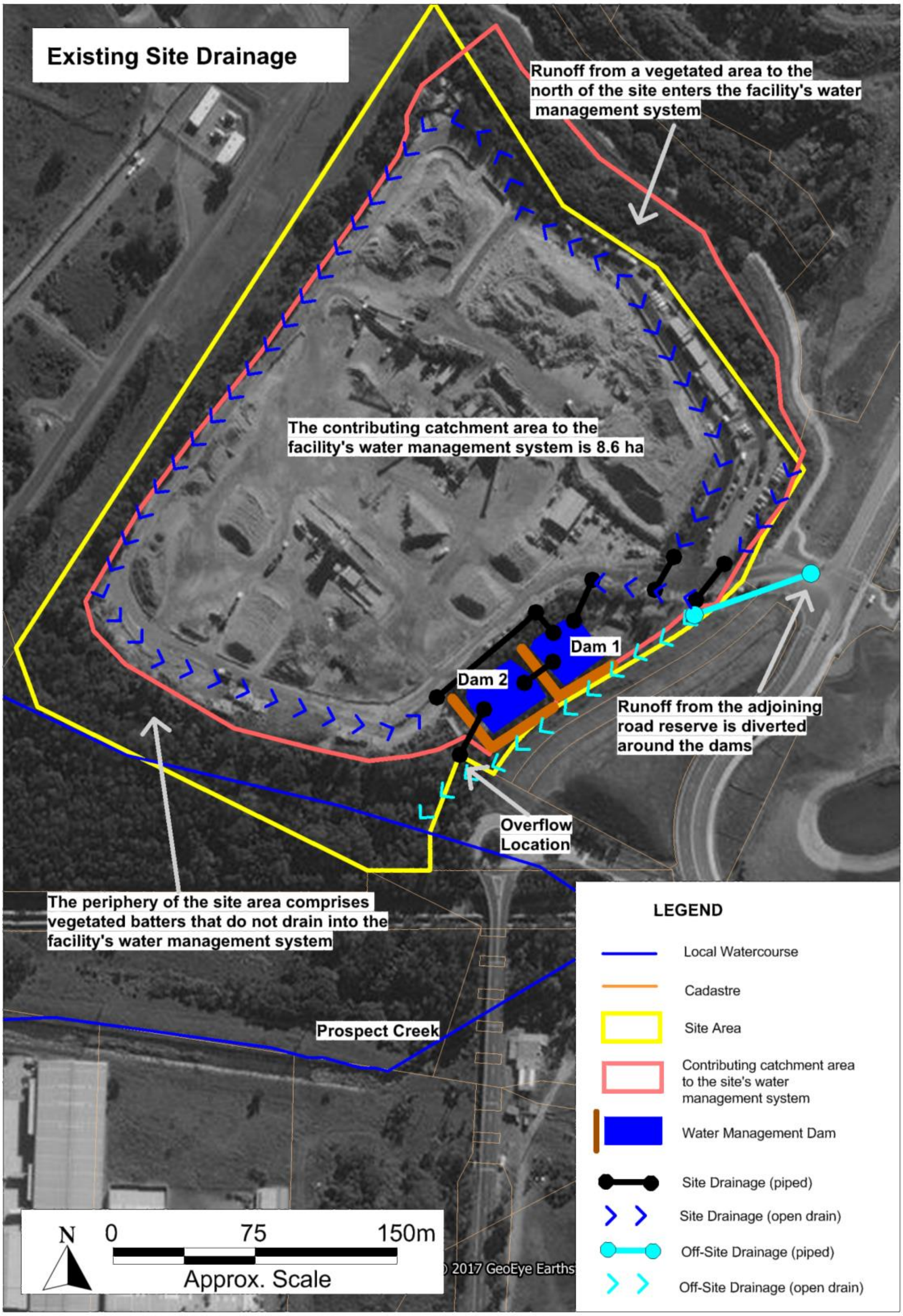


Figure 5 – *Existing Site Drainage*

The 8.6 ha Water Management Area was divided into a seven categories based on the land use and expected hydrologic response. The areas of each category were digitised from aerial photography. **Table 3-3** provides a summary of the key characteristics of each category. These categories were applied to water balance modelling that is discussed in **Section 5**.

Table 3-3 – *Water Management Area Categories*

Category	Area (ha)	Description
Stockpiles	2.6 to 3.2	Comprises stockpiles of raw feed, cement washout and processed product. The net stockpile area varies between 2.6 to 3.2 ha in line with the volume of material held on site.
Haul Roads	2.1 to 2.7	Comprise a mixture of hardstand and compacted dirt haul roads. The net haul road area varies between 2.1 to 2.7 ha in line with the stockpile footprint.
Plant Area	0.4	Refers to the area immediately around the two materials processing plants.
Building and Car Park	0.6	Site administration buildings and staff and visitor parking. Predominantly impervious surfaces.
General Site Area	0.7	Primarily lay-down areas.
Vegetated Areas	1.4	Primarily vegetated batters.
Water Management Basins	0.2	Refers to Dams 1 and 2.
Total	**8.6**	

Photo 1 shows a typical area of the facility. Haul roads, product stockpiles and process areas are evident in the image.

Photo 1 – *An image of the facility showing haul roads, product stockpiles and processing area.*

3.2.2 Water Management Dams

As indicated in **Figure 4**, Dams 1 and 2 are the primary water management controls for the site. Dam 1 receives all surface runoff from the 8.6 ha Water Management Area. When full, Dam 1 overflows into Dam 2 via a piped drainage system. When storage levels are low, additional transfers from Dam 1 to Dam 2 are made via pumping. Dam 2 is progressively dewatered to provide water for onsite haul road, stockpile and conveyor dust suppression. This substantially reduces the frequency and magnitude of site overflows.

Uncontrolled overflows from Dam 2 occur when the water level reaches the invert of the dam's outlet pipe. Uncontrolled overflows are permitted under EPL Condition L1.2 only when the preceding 5 day rainfall total exceeds 45mm.

Boral engaged Mepstead and Associates to undertake a detailed survey of Dams 1 and 2 and the surrounding area. The survey incorporated basin depth measurements that were made by the dredging contractor following the completion of dredging in February 2017. Volumetric calculations were made from a three-dimensional surface created from the detailed survey. The calculated volume (below the invert of dam overflow pipes) was 1.5 ML for Dam 1 and 1.7 ML for Dam 2, resulting in a collective dam storage capacity of 3.2 ML. A detailed topographic survey sheet is provided in **Appendix A**.

As sediment will re-accumulate in the base of both dams overtime, the 3.2 ML storage was divided into Sediment Storage and Water Storage categories for both current (post dredging) and medium term conditions (allowing for sediment accumulation). **Table 3-4** details the assumed storage characteristics, which were applied to water balance modelling.

Table 3-4 – *Assumed Storage Characteristics*

Storage Category	Functionality	Storage Volume	
		Current Conditions (post dredging)	**Medium Term Conditions** (allowing for sediment accumulation)
Sediment Storage	Reserved for the storage of sediment. Not accessible by pumping.	0.7 ML	1.4 ML
Water Storage	Refers to stored water that can be pumped from the dams for on-site use.	2.5 ML	1.8 ML
Total		**3.2 ML**	**3.2 ML**

3.2.3 Water Quality Controls

As noted in **Figure 4**, the existing water management system includes the following water quality controls:

- Numerous sediment pits have been established throughout the site. These pits are frequently cleaned out to reduce sediment loads entering the downstream dams.
- Flocculating agents are applied to outflows from the truck wheel wash.
- All runoff from the 8.6 ha Water Management Area enters Dam 1, which provides primary sedimentation treatment.
- Dam 1 overflows into Dam 2 via a pipe outfall arrangement. Dam 2 provides additional sedimentation treatment. Dam 2 also includes the following additional treatment measures:
    - Inflows into Dam 2 spill over a rack of flocculating blocks, which are intended to slowly release flocculating agent.
    - Water is progressively pumped from Dam 2 and treated in a water treatment plant (acid dosing plant) that adjusts pH. Treated water is returned to Dam 2. It is noted that this treatment system was not operated during the SWCA sampling period to avoid any potential interference with the water quality sampling program.

3.2.4 Site Overflows

Uncontrolled overflows from Dam 2 occur when the water level reaches the invert of the dam's outlet pipe. Uncontrolled overflows are permitted under EPL Condition L1.2 only when the preceding 5 day rainfall total exceeds 45mm. No other overflows or discharges are permitted in the EPL.

3.2.5 Process Water Use

Process water is used for:

- Haul road dust suppression;
- Stockpile dust suppression; and
- Dust suppression within the processing plant.

Table 3-5 provides details for each of the above process water uses. Note, further information on process water use rates is provided in **Section 5,** which describes the water balance model calibration. It is noted that no process water is used on Sunday and public holidays when the facility is shut.

Table 3-5 – *Process Water Use Profiles*

Process Water Use	Description	Potential Daily Use[1]
Haul road dust suppression	Applied via a water cart to the haul road area. Water use varies in line with prevailing climatic conditions	Varies between 50 to 220 KL/day
Stockpile dust suppression	Applied via fixed sprinklers and a water cannon fixed to the water cart. The water storage potential of stockpiles is discussed further in **Section 3.2.6**.	Varies between 250 to 410 KL/day
Dust suppression within processing plant	Constant use in line with production rates	40 KL/day

Note 1: Refer to **Section 5.2** (water balance calibration) for further information on the assumed process water use rates.

3.2.6 Stockpile Water Storage Potential

During wet weather conditions Boral applies water to the various stockpiles using fixed sprinkler systems and a water cannon that is attached to a water cart (as shown on the front cover of this report). Water balance calibration data that is presented in **Section 5** demonstrates that this is an effective means of disposing of water during wet weather conditions. This section provides a theoretical explanation as to why stockpiles can absorb significant volumes of water and is intended to support associated discussions in **Section 5**.

The water holding potential of a stockpile is a function of the height of the stockpile and the water holding potential of the material. The water holding potential of a material is referred to as the Specific Retention (S_r), which is technically defined as the ratio of the volume of water a material can retain against gravity to the total volume of the material. For example stockpiled material with a S_r of 10% can hold water equivalent to 10% of the stockpile volume before any seepage through the base of the stockpile occurs.

The S_r of a material is typically correlated to the particle or grain size of the material. **Figure 6** shows a typical S_r particle size curve which shows that typically gravelly material has a S_r ranging from 1% (coarse gravel) to 5% (fine gravel) and sandy material has a S_r ranging from 6% (coarse sand) to 17% (fine sand). Boral regularly undertake laboratory testing of DGB and UBB products and have provided typical particle size distributions for each product type. Key information from the material grading is annotated on **Figure 6,** while the laboratory certificates are provided as **Appendix B**.

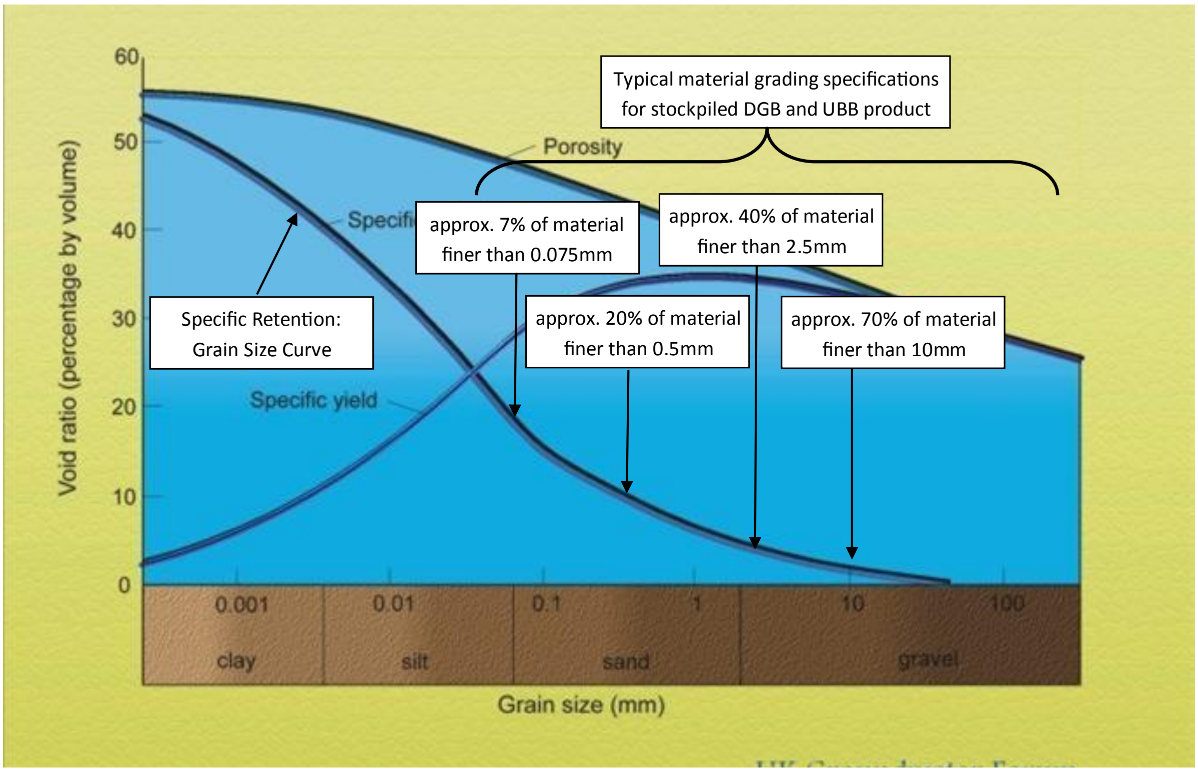


Figure 6 – *Typical S_r to Particle Size Correlation*

As noted in **Figure 6,** both the DGB and UBB products comprise approximately 60% gravelly material and 40% sandy material. A mean weighted S_r for product stockpiles was estimated by RHDHV to be between 5 to 7%. The site also comprises significant stockpiles of raw feed (unprocessed material) and cement wash out material. Both the raw feed and washout stockpiles were observed by RHDHV to comprise some fine materials, suggesting that a mean weighted S_r between 2 of 4% would be conservative. Photographs of stockpiled material are provided in **Appendix B**.

Figure 7 shows the extent of the product, raw feed and washout stockpiles.

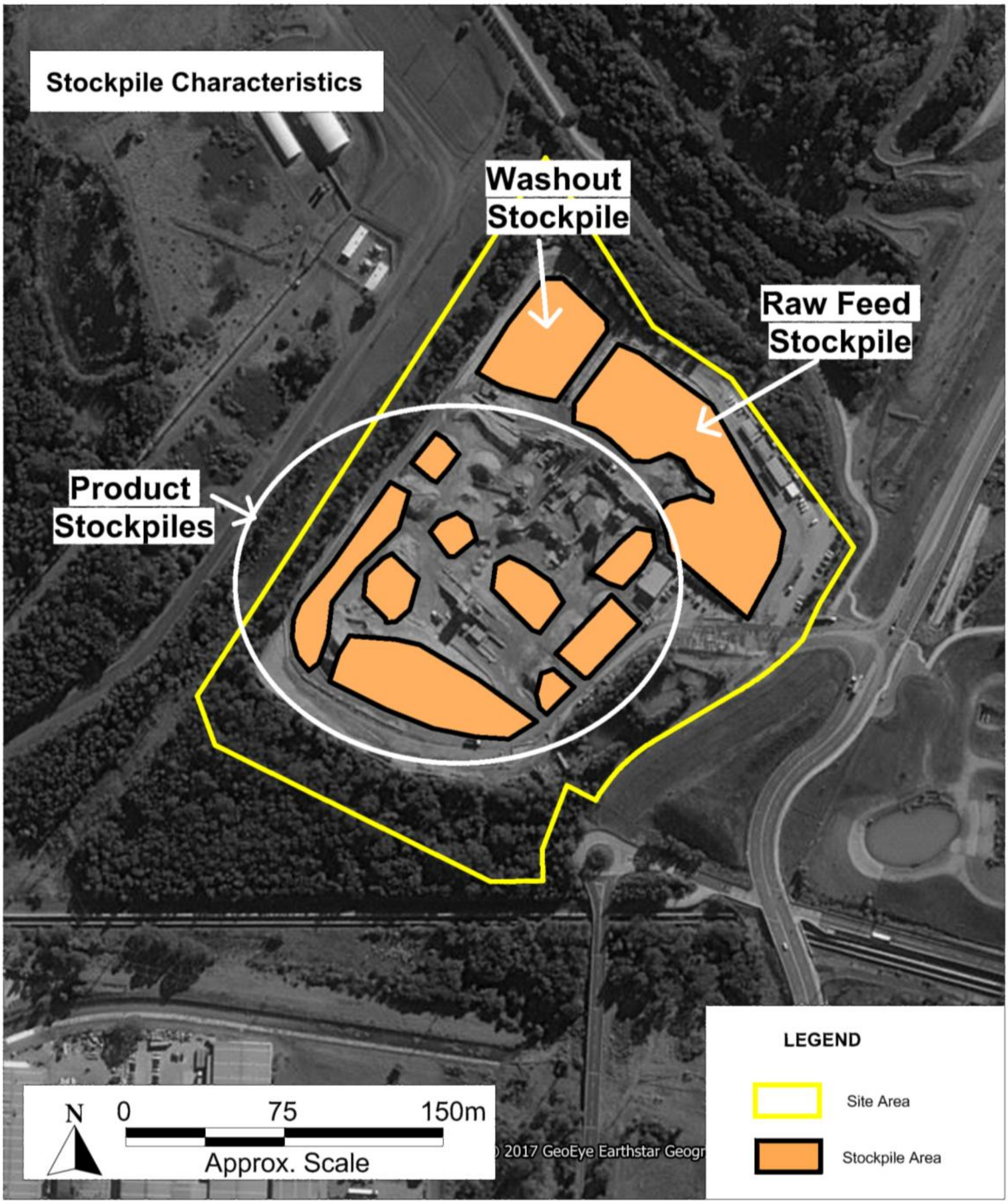


Figure 7 *– Extent of Stockpiles (based on a 2.6 ha stockpile area)*

The water holding potential of site stockpiles was estimated as function of the expected S_r, stockpile footprint and average height. **Table 3-6** provides associated assumptions and the calculated water holding potential. It is noted that the intention of providing this information in this report is to demonstrate that stockpiles can absorb significant volumes of water, not to precisely calculate the water holding potential of stockpiles.

***Table 3-6** – Indicative Stockpile Water Holding Potential*

	Material Description	Indicative S_r	Stock pile Area	Stockpile Height		Stockpile Volume	Water Holding Potential (m^3)	
				Max	Average		Unit Area	Total Stockpile
		(%)	(m^2)	(m)	(m)	(m^3)	(mm/m^2)	(m^3)
Raw Feed Stockpile	Coarse materials such as broken bricks with some fines.	2 to 4 Avg 3	9,500	20	15	142,500	450	4,275
Washout Stockpile	Reclaimed concrete. Large chunks with some fines.	2 to 4 Avg 3	3,800	20	15	57,000	450	1,710
Product Stockpiles	Graded DGB and UGB product. Grading specifications are provided in **Appendix B**.	5 to 7 Avg 6	12,700	4	2	25,400	120	1,524
Totals			26,000					7,509

Information presented in **Table 3-6** indicates that raw feed and washout stockpiles can potentially absorb 450mm of water, while the lower height product stockpiles can absorb 120 mm of water. Collectively, all stockpiles can potentially absorb 7.5 ML of water, more than three times the water storage volume in Dams 1 and 2 (2.5 ML). Boral have advised that typically incoming material is processed and sold within two to three weeks. Hence, the majority of absorbed water in the stockpiles is expected to leave the facility bound to product material. The rate of bound water export from the facility will increase when the material throughput increases from 750,000 tpa to1,000,000 tpa.

While it is acknowledged that the calculation of the water holding capacity of stockpiles cannot be easily verified and would be sensitive to antecedent moisture levels, the information presented in this section demonstrates that the stockpiles can absorb significant volumes of water. This is supported by the water balance model calibration that is discussed in **Section 5**.

3.3 Local Watercourses

Overflows from the facility enter Prospect Creek, immediately upstream of the Widemere Road Bridge. The Prospect Creek Catchment area (upstream of the bridge) is estimated to be 1,036 ha. Accordingly, the facility's 8.6ha Water Management Area forms 0.8% of the contributing catchment area at the site overflow location. Aerial imagery indicates that land uses within the catchment comprise a mixture of vegetated areas (40%), industrial areas (50%) and urban areas (10%). The creek channel and riparian zones have been highly modified, with significant reaches of concrete lined channel established. Due to these significant modifications to the catchment and watercourse, Prospect Creek is considered to be a highly disturbed watercourse.

Figure 8 shows the Prospect Creek catchment area.

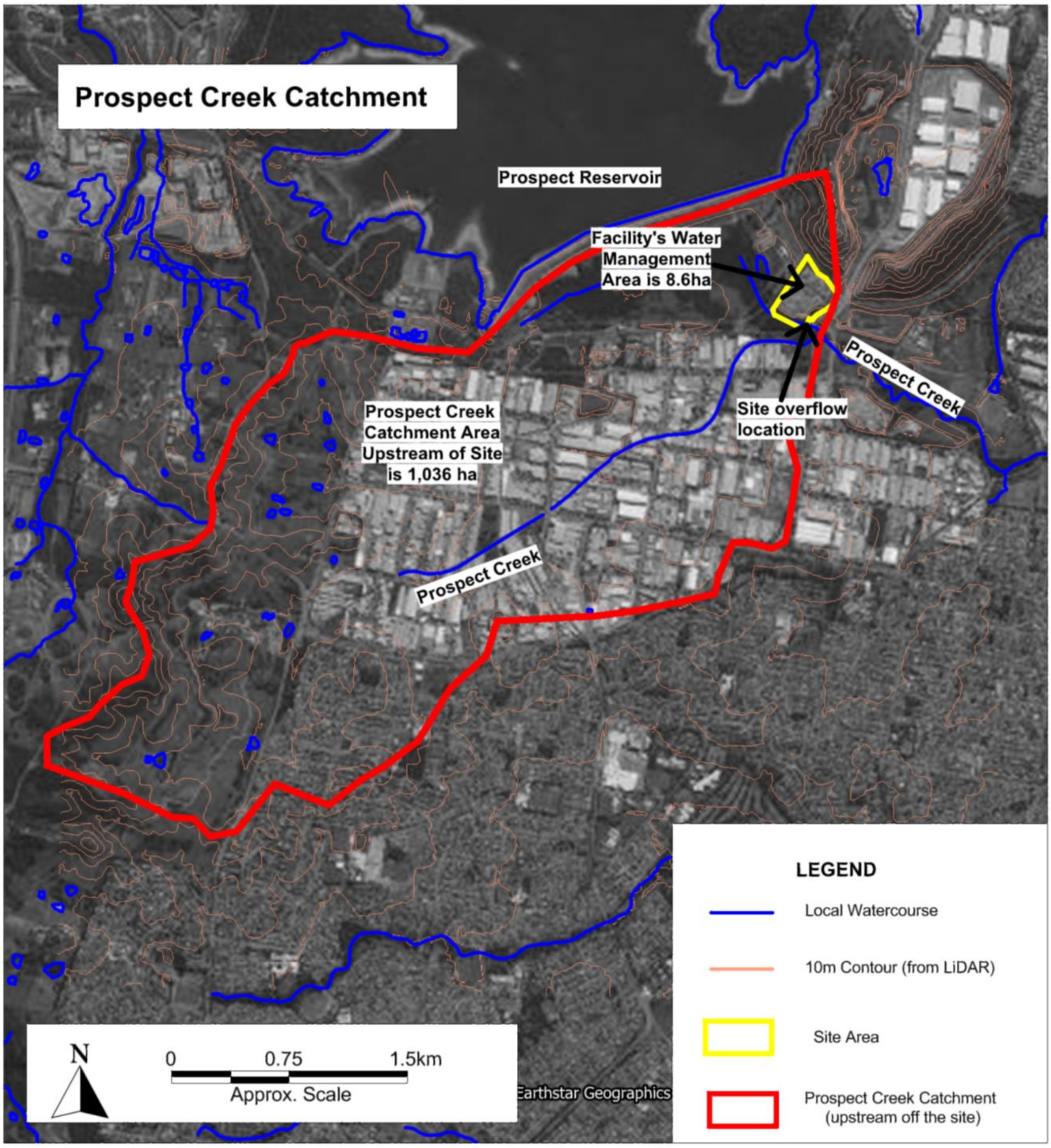


Figure 8 – *Prospect Creek Catchment*

4 SWCA OVERVIEW

The SWCA was prepared by RHDHV on behalf of Boral, with input from Victory Engineering and EMM. Boral submitted the SWCA to the EPA on 5 April 2017. The SWCA addressed the requirements of EPL Conditions U1.2, U1.3 and U1.4 which form part of the PRP. Broadly the scope of the SWCA was to characterise the surface water quality within the facility and assess the facility's potential to impact the quality of receiving waters. This section provides an overview of the SWCA.

4.1 Sampling and Analysis Overview

The SWCA was informed by 9 surface water sampling events that were undertaken between 14 December 2016 and 23 March 2017. The initial portion of the period was characterised by unusually hot conditions, with moderate amounts of rainfall. A significant amount of rainfall occurred in late February and throughout March. This substantial rainfall resulted in uncontrolled overflows occurring on the 2nd and 3rd of March and again on the 18th of March. The 5 day rainfall total during both overflow events was in excess of 100mm, comfortably above the 45mm five day rainfall total that is specified as the permissible discharge threshold in both the EPL (Condition L1.2) and Consent Conditions (no.25). 6 of the 9 sampling events were undertaken during wet weather conditions.

Boral engaged a dredging contractor to dredge accumulated sediment in Dams 1 and 2. This was undertaken over a 13 day period from the 3 to 15 of February 2017. 6 of the 9 sampling events were undertaken following the completion of dredging, exceeding the minimum requirement of 5 post dredging samples that is specified in the EPL (Condition U1.4c).

Figure 9 shows the sampling dates relative to both the daily and 5 day rainfall totals, the dredging period and the two uncontrolled overflow events that occurred over the period.

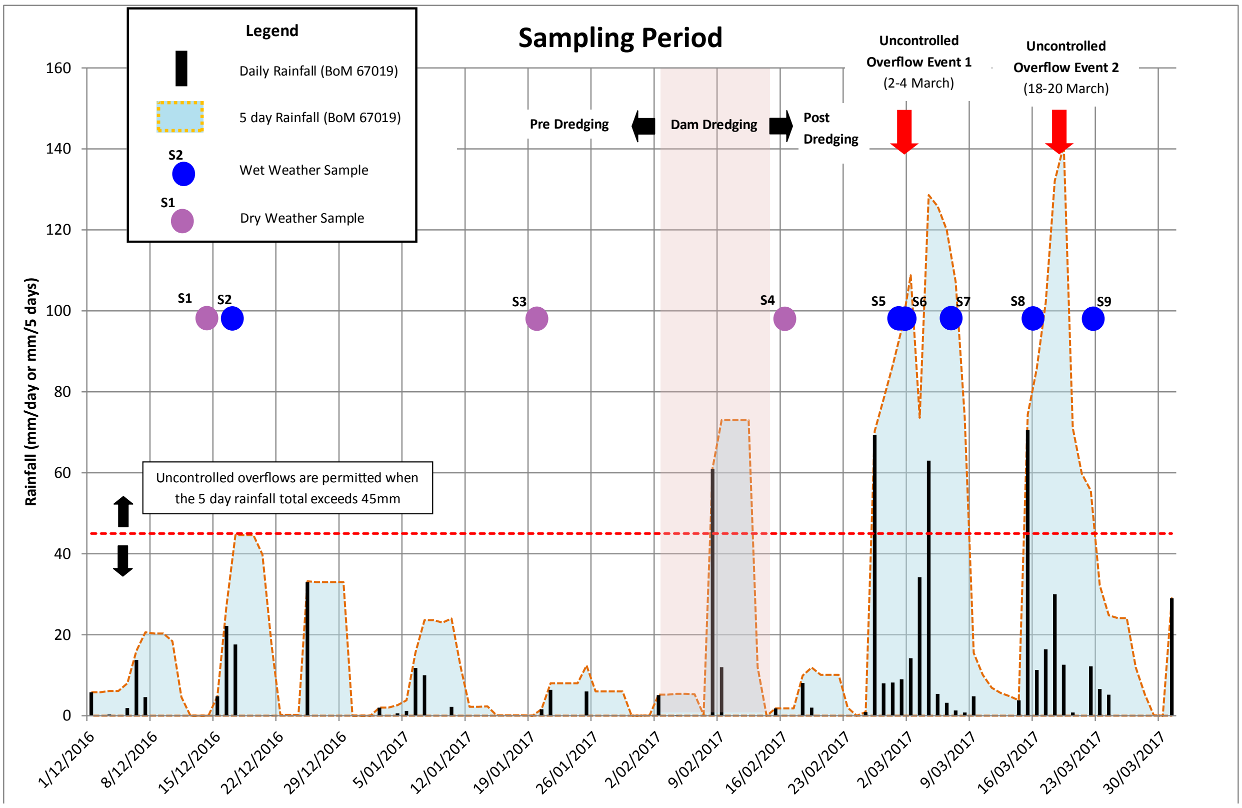


Figure 9 – *Sampling Period*

Most samples were tested for a comprehensive suite of over 400 analytes. Trigger values were established by Victory Engineering for each detected contaminants using the methods documented in the ANZECC (2000) Guidelines for slightly-to-moderately disturbed ecosystems. These trigger values provide a conservative reference for water quality that is unlikely to cause environmental harm to a slightly-to-moderately disturbed watercourse. Refer to the SWCA for detailed information on the trigger value development for each analyte.

4.2 Results Summary

All water quality results in Dam 2 were compared to the trigger values to identify analytes of concern. This process identified the following analytes that exceeded trigger values (by varying amounts) in Dam 2 on at least one occasion:

- pH
- Suspended Solids.
- Nutrients (Total Phosphorous, Total Nitrogen, Ammonia and Nitrate (NOx).
- Dissolved Metals (Al, Ba, Cr (VI), Cu, Sr, Va and Hexavalent Chromium).
- Fluoride, Cyanide and Chlorine.
- Phenolics (2-Methylphenol, 3&4-methylphenol and 2,4-Dimethylphenol).
- Carbendazim and Anionic Surfactants.

Table 4-1 provides a summary of key results.

Table 4-1 – *Key Results Summary Table*

Analyte	Trigger Value[3]	Units		Untreated Runoff (Dam 1 inflows)	Dam 2 (Dry Weather)	Dam 2 (Wet Weather)	Prospect Creek (Upstream of Site)	Typical Concentrations of Urban Stormwater[1]
pH	6.5 – 8.5		Samples	2	3	6	2	48[1]
			Min	**10.4**	7.5	8.1	7.6	-1 SD: 6.3[1]
			Avg	**10.5**	7.9	**9.8**	7.7	Mean: 6.9[1]
			Max	**10.7**	8.3	**10.4**	7.8	+1 SD 7.5[1]
Suspended Solids	50	(mg/l)	Samples	2	3	6	1	247[1]
			Min	**122**	48	5	8	-1 SD: 50[1]
			Avg	**219**	**105**	**52**	8	Mean: 150[1]
			Max	**315**	**202**	**147**	8	+1 SD: 400[1]
Total Phosphorous	25	(ug/l)	Samples	2	3	6	2	206[1]
			Min	22	13	8	20	-1 SD: 150[1]
			Avg	**61**	**78**	**46**	**84**	Mean: 320[1]
			Max	**100**	**200**	**143**	**147**	+1 SD: 840[1]
Ammonia	20	(ug/l)	Samples	2	3	6	2	17[2]
			Min	**114**	**130**	**31**	16	EMC ranges from 20 to 540[2]
			Avg	**182**	**332**	**176**	**29**	
			Max	**250**	**690**	**337**	**42**	
Nitrate (Total NOx)	40	(ug/l)	Samples	2	3	6	2	17[2]
			Min	**1,190**	**63**	**382**	**129**	EMC ranges from 150 to 510[2]
			Avg	**5,945**	**298**	**2,562**	**176**	
			Max	**10,700**	**530**	**6,100**	**222**	
Total Nitrogen	350	(ug/l)	Samples	2	3	6	2	139[1]
			Min	**4,300**	**1,300**	**1,160**	**740**	-1 SD: 1,400[1]
			Avg	**8,550**	**1,953**	**5,297**	**915**	Mean: 2,400[1]
			Max	**12,800**	**2,500**	**7,950**	**1,090**	+1 SD: 5,000[1]
Aluminium (Al)	55	(ug/l)	Samples	2	3	6	2	No Data Available
			Min	**2,380**	**120**	**172**	13	
			Avg	**2,495**	**132**	**1,556**	**108**	
			Max	**2,610**	**140**	**2,700**	**203**	
Barium (Ba)	8	(ug/l)	Samples	2	3	6	2	No Data Available
			Min	**10**	**11**	5	**49**	
			Avg	**14**	**13**	**10**	**51**	
			Max	**17**	**14**	**12**	**52**	
Chromium (Cr)	1	(ug/l)	Samples	2	3	6	1	65[1]
			Min	**32**	1	**5**	1	-1 SD: 5[1]
			Avg	**34**	**2**	**18**	1	Mean: 15[1]
			Max	**36**	**4**	**26**	1	+1 SD: 110[1]
Copper (Cu)	2.9	(ug/l)	Samples	2	3	6	2	140[1]
			Min	**24**	2	**8**	**6**	-1 SD: 18[1]
			Avg	**24**	**9**	**16**	**7**	Mean: 50[1]
			Max	**24**	**18**	**23**	**7**	+1 SD: 150[1]
Strontium (Sr)	150	(ug/l)	Samples	1	1	6	2	No Data Available
			Min	**176**	84	90	120	
			Avg	**176**	84	129	**165**	
			Max	**176**	84	**167**	**210**	
Vanadium (Va)	6	(ug/l)	Samples	2	2	6	2	No Data Available
			Min	**40**	**8**	**16**	1	
			Avg	**47**	**14**	**36**	2	
			Max	**53**	**20**	**45**	2	
Hexavalent Chromium	**1**	(ug/l)	Samples	1	No Samples	6	No Samples	No Data Available
			Min	**40**	-	**4**	-	
			Avg	**40**	-	**20**	-	
			Max	**40**	-	**31**	-	

Analyte	Trigger Value[3]	Units		Untreated Runoff (Dam 1 inflows)	Dam 2 (Dry Weather)	Dam 2 (Wet Weather)	Prospect Creek (Upstream of Site)	Typical Concentrations of Urban Stormwater[1]
Fluoride	115	(ug/l)	Samples	1	2	3	No Samples	No Data Available
			Min	**200**	**587**	**200**	-	
			Avg	**200**	**595**	**267**	-	
			Max	**200**	**600**	**300**	-	
Cyanide	7	(ug/l)	Samples	No Samples	No Samples	4	No Samples	No Data Available
			Min	-	-	7	-	
			Avg	-	-	**8**	-	
			Max	-	-	**10**	-	
2-Methylphenol	13	(ug/l)	Samples	No Samples	1	No Samples	No Samples	No Data Available
			Min	-	**234**	-	-	
			Avg	-	**234**	-	-	
			Max	-	**234**	-	-	
3, 4-Methylphenol	35	(ug/l)	Samples	No Samples	1	No Samples	No Samples	No Data Available
			Min	-	**509**	-	-	
			Avg	-	**509**	-	-	
			Max	-	**509**	-	-	
2, 4-Dimethylphenol	2	(ug/l)	Samples	No Samples	1	No Samples	No Samples	No Data Available
			Min	-	**142**	-	-	
			Avg	-	**142**	-	-	
			Max	-	**142**	-	-	
Aniline	8	(ug/l)	Samples	No Samples	1	No Samples	No Samples	No Data Available
			Min	-	**28**	-	-	
			Avg	-	**28**	-	-	
			Max	-	**28**	-	-	
Carbendazim	0.5	(ug/l)	Samples	1	1	6	No Samples	No Data Available
			Min	**1.8**	0.2	0.2	-	
			Avg	**1.8**	0.2	**0.6**	-	
			Max	**1.8**	0.2	**1.1**	-	
Anionic Surfactants	50	(ug/l)	Samples	1	1	3	1	No Data Available
			Min	**200**	**100**	**100**	**100**	
			Avg	**200**	**100**	**267**	**100**	
			Max	**200**	**100**	**400**	**100**	
Chlorine	3	(ug/l)	Samples	1	No Samples	2	2	No Data Available
			Min	**30**	-	**20**	**20**	
			Avg	**30**	-	**25**	**35**	
			Max	**30**	-	**30**	**50**	

Bold denotes trigger value exceeded.

Note 1: value sourced from Chapter 3 (Urban Stormwater Pollutant Characteristics) of Australian Runoff Quality (IEAust, 2005). The mean and ± 1 Standard Deviation (SD) values for the "All urban" category are reported along with the number of samples used to inform the published values.

Note 2: value sourced from Table 2.25 from Fletcher et all (2004). The range in calculated Event Mean Concentrations (EMCs) is provided.

Note 3: Refer to the SWCA for detailed information on the development of the Trigger Values.

4.3 Results Discussion

The following conclusions can be made from the water quality data summarised in **Table 4-1** and documented in detail in the SWCA (RHDHV, 2017):

- pH values in Dam 2 wet weather samples were measured to be between 8.1 to 10.4, consistently above the trigger value range of 6.5 to 8.5. Similar values were recorded in Dam 1 inflows. The pH during dry weather conditions was within the trigger value range for all samples. These results indicate that runoff from the site is moderately basic. As noted in **Section 3**, the acid dosing plant in Dam 2 was not operating over the monitoring period. This was done to avoid any potential interference with the water quality sampling program. Accordingly, the elevated pH levels in Dam 2 do not imply that the acid dosing plant is ineffective.

- Suspended solid concentrations in Dam 2 wet weather samples were measured to be between 5 and 147 mg/l, averaging 50 mg/l. These concentrations were substantially below the Dam 1 inflow concentrations which ranged from 122 to 315 mg/l. These results indicate that sedimentation is an effective treatment process during wet weather conditions, but suspended sediment concentrations are likely to exceed the 50 mg/l trigger value during some overflow events.

- Total Phosphorus concentrations in Dam 2 wet weather samples were measured to be between 8 and 143 ug/l, averaging 46 ug/l. Similar concentrations were measured in Dam 1 inflows indicating that Dams 1 and 2 do not provide material phosphorus removal. The Dam 2 wet weather concentrations were favourable when compared to the typical range in values in urban stormwater (150 to 840 ug/l).

- Total Nitrogen concentrations in Dam 2 wet weather samples were measured to be between 1,160 and 7,950 ug/l, averaging 5,297 ug/l. Higher concentrations were measured in Dam 1 inflows indicating that Dams 1 and 2 provide some material nitrogen removal. The measured concentrations are substantially above both the trigger value (350 ug/l) and the typical range in values in urban stormwater (1,400 to 5,000 ug/l) Monitoring results indicate that the majority of Nitrogen is in the oxidised NO_x form.

- Dissolved metal concentrations of Aluminium, Chromium, Copper and Vanadium in Dam 2 wet weather samples were between 5 to 50 times higher than the relevant trigger values. Some measured concentrations of Barium and Strontium marginally exceed the relevant trigger values. For all of the above metals, concentrations were higher in the Dam 1 inflow samples, indicating that the sedimentation process provides material removal of metals.

- Hexavalent Chromium exceeded the trigger value of 1 ug/l in all samples. However, it is noted that all measured concentrations were below the Australian Drinking Water Guideline recommended concentration of 50 ug/l for potable water.

- Fluoride concentrations were highest in Dam 2 dry weather samples as well as the Dam 1 inflow (small) sample, which sampled water from the leaky mains pipe. This data indicates that the elevated fluoride concentrations are at least partially attributed to inflows from the leaky mains pipe.

- Some Cyanide concentrations in Dam 2 wet weather samples were marginally above the trigger values.

- Chlorine concentrations in Dam 2 wet weather samples were above the trigger value. However, chlorine readily breaks down and is not considered to be a key analyte of concern.

- Measured concentrations of 2 Methylphenol, 3-4 Methylphenol, 2-4 Dimethylphenol, Aniline, Anionic Surfactants and Carbendazim exceed the calculated trigger values. Refer to the commentary column Appendix A of the SWCA (RHDHV, 2017) for further information on these chemicals.

Potential Sources of Contamination

The extent and nature of contaminants detected are consistent with what could be reasonably expected from an operational processing building waste. As a result, the contaminants are generally unavoidable, and need to be managed by an appropriate surface water mitigation and monitoring system.

Impacts of Dredging

With reference to the results presented in Appendix A of the SWCA (RHDHV, 2017), post dredging samples generally returned higher concentrations of analytes of concern than pre dredging samples. In particular, Aluminium and Nitrogen concentrations were markedly higher. As the end of dredging period coincided with the commencement of the mid-February to March wet period, it is likely that the higher concentrations are associated with the higher runoff volumes rather than any temporary post dredging impacts. This is supported by the similarly high Aluminium and Nitrogen concentrations in sampling of untreated runoff (Dam 1 inflow location) during the wet period.

Potential Impacts

Potential water quality impacts are discussed in **Section 6.2**.

5 WATER BALANCE MODEL DEVELOPMENT AND CALIBRATION

A site water balance model of the facility's water management system was developed and calibrated. The model was applied to assess the adequacy of the existing system and potential benefits associated with a range of water management system improvement options. This section provides detailed information on the development and calibration of the site water balance model and is structured as follows:

- **Section 5.1** describes the water balance modelling approach.
- **Section 5.2** reviews data that was collected by Boral for use in the calibration.
- **Section 5.3** describes the model calibration process and outcomes.
- **Section 5.4** describes the Assessment Model development and verification.

Water balance model results for the existing water management system and potential improvement options are discussed in **Sections 6** and **7** respectively. This section also makes frequent reference to **Section 3** which describes the existing water management system.

5.1 Water Balance Modelling Approach

The following two water balance models were developed to inform this SWMMP:

- **Calibration Model**: The water balance model was calibrated using available data that was collected by Boral over a 42 day calibration period. The key objective of the model calibration was to use data to parametrise a reliable rainfall runoff model of the Surface Water Management Area and to establish site water use profiles.
- **Assessment Model**: The assessment model applies the calibration outcomes and simulates the site water balance using a long-term rainfall record. The assessment model was used to assess the effectiveness of the existing water management system and a range of potential improvement options using a similar methodology.

Table 5-1 provides a summary of the water balance modelling approach applied to both of the above-mentioned models. Model assumptions are discussed further in subsequent sections.

Table 5-1 – *Water Balance Modelling Approach*

	Calibration Model	Assessment Model
Modelling Approach	Continuous simulation approach using a daily time step model.	
Simulation Period	42 day calibration period (17/2/2017 to 31/03/2017)	27 year simulation period (1990 to March 2017)
Rainfall Assumptions	Daily rainfall recorded at BoM's three local gauges (as discussed in **Section 3.1**).	Daily rainfall recorded at the Prospect Dam rainfall gauge (BoM 67019), which is located 1.5km to the north of the site.
Rainfall Runoff Model	A daily time step rainfall runoff model was developed and calibrated using available data. The same model was applied to both the calibration and assessment models.	
Site Water Use	Daily process water use estimates that were provided by Boral were applied to the model.	Process water use was calculated by the model based on the calibration outcome.
Site Overflows	Calculated from water level data.	Calculated by the water balance model.
Leaky Mains Pipe Inflows	Estimated by RHDHV.	

5.2 Review of Calibration Period and Data

The water balance model was calibrated using available data from the 17 February to 31 March 2017 period (a 42 day period). The calibration period commenced following unusually hot conditions in January and early February. A significant amount of rainfall occurred in late February and throughout March. The recorded monthly rainfall total for March at the Prospect Dam gauge (BoM 67019) was 335mm exceeding the 95th percentile monthly rainfall of 292mm. This substantial rainfall resulted in uncontrolled overflows occurring intermittently between 2 and 4 of March and again between 18 and 20 of March. The 5 day rainfall total during both overflow events was in excess of 100mm, comfortably above the 45mm five day rainfall total that is specified as the permissible discharge threshold in both the EPL (Condition L1.2) and Consent Conditions (no.25). The persistent wet weather conditions and occurrence of two overflow events provided an ideal data set to calibrate a water balance model.

Boral advised that stockpile volumes were higher than normal over the calibration period. Accordingly, the higher bound stockpile area (3.2ha) and lower bound haul road area (2.1 ha) estimates that are provided in **Table 3-3** were adopted for model calibration.

The following sections review data that was used for model calibration.

Rainfall Data

Daily rainfall data from the three local BoM operated rainfall gauges that are discussed in **Section 3.1** were considered when calibrating the model. Rainfall totals recorded at the three gauges over the period ranged from 336 mm (Horsley Park BoM 67119) to 431 mm (Prospect Dam BoM 67019), indicating that there was substantial spatial variation in rainfall over the period. Preference was given to the Prospect Dam gauge data due to its proximity to the site. However, some adjustments were made for days when the rainfall recorded at the Prospect Dam gauge did not correlate with the runoff response calculated from the water level data (discussed below). The adopted calibration rainfall time-series totalled 370 mm over the period, within the above-mentioned range of recorded totals at the three BoM gauges. It is noted that adopting lower assumed rainfall for calibration is considered to be conservative as the model will be calibrated to produce the same volume of runoff (which was calculated independently from the water level data) from less rainfall.

Appendix C compares the recorded daily rainfall at the three BoM gauges over the period and the adopted calibration rainfall time-series.

Water Level Data

EMM installed continuous water pressure sensors in Dams 1 and 2. The pressure sensors measure water pressure, which once corrected for atmospheric pressure can be used to calculate water depths above the sensors. Water levels were calculated using a known datum. **Figure 10** shows the calculated water levels in Dams 1 and 2 over the period.

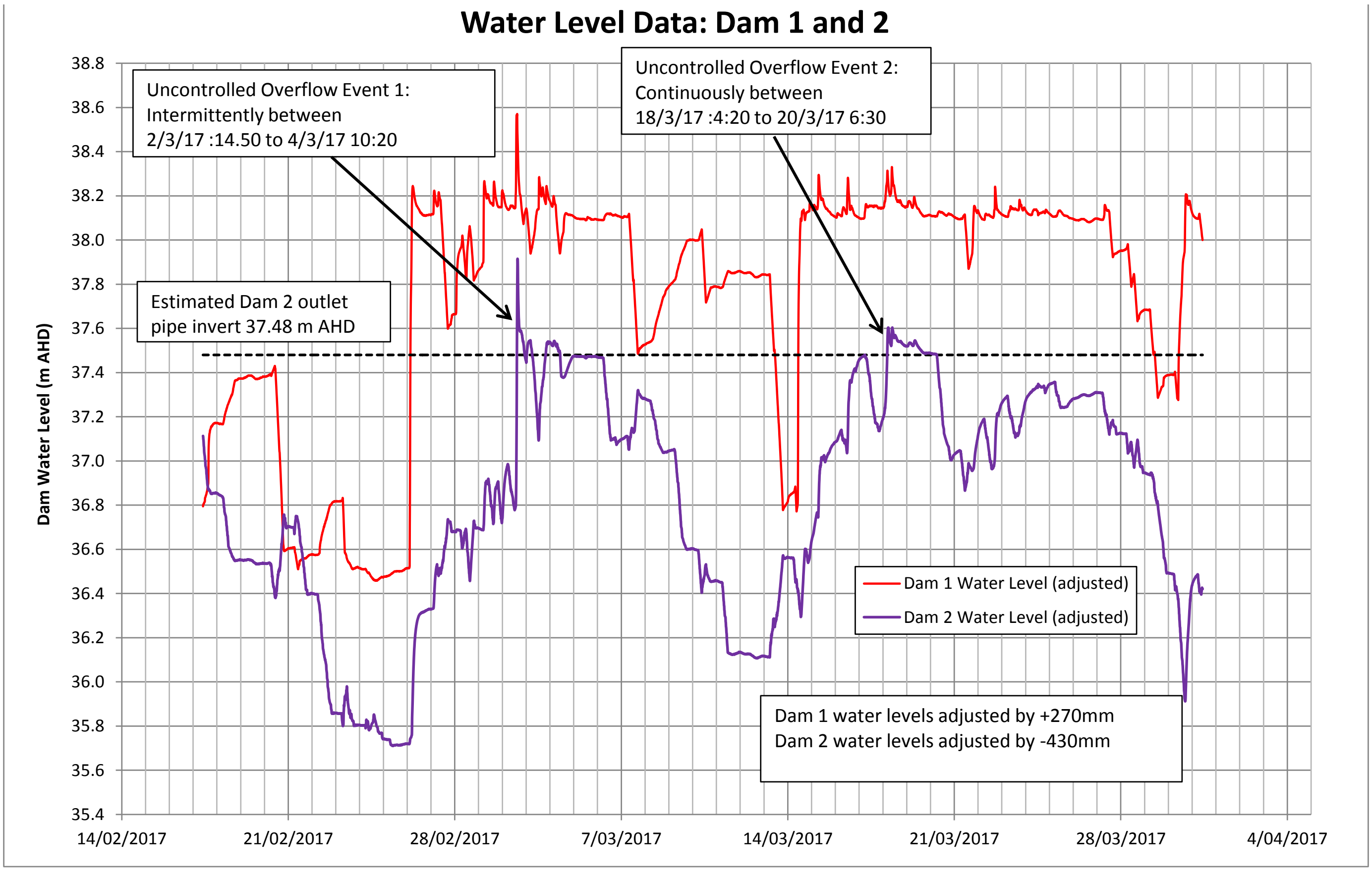


Figure 10 – *Calculated Water Levels in Dams 1 and 2.*

The data presented in **Figure 10** indicates that the Dam 1 water level responds rapidly to runoff. Overflows from Dam 1 occur when the water level exceeds 38.15 m AHD. The Dam 2 water level tends to rise at a slower rate. This is because water is regularly extracted from Dam 2 for process water use. Dam 2 overflows to Prospect Creek when the water level exceeds the outlet pipe invert of 37.48m AHD. Two independent overflow events were recorded over the period.

The following information was calculated from the dam water level data:

- Dam storage levels were calculated as a function of the calculated water level and the storage / level information that was established from the detailed topographic survey of the dams (provided in **Appendix A**).

- Dam 2 overflow rates and volumes were calculated at 10 minute intervals as a function of the depth of water above the invert of the outlet pipe and a typical flow depth relationship for a 700mm diameter corrugated steel pipe. The accuracy of the overflow volume calculations are expected to be ±50%.

Figure 11 plots the calculated Dam 1 and 2 storage volumes and Dam 2 overflow rates and volumes.

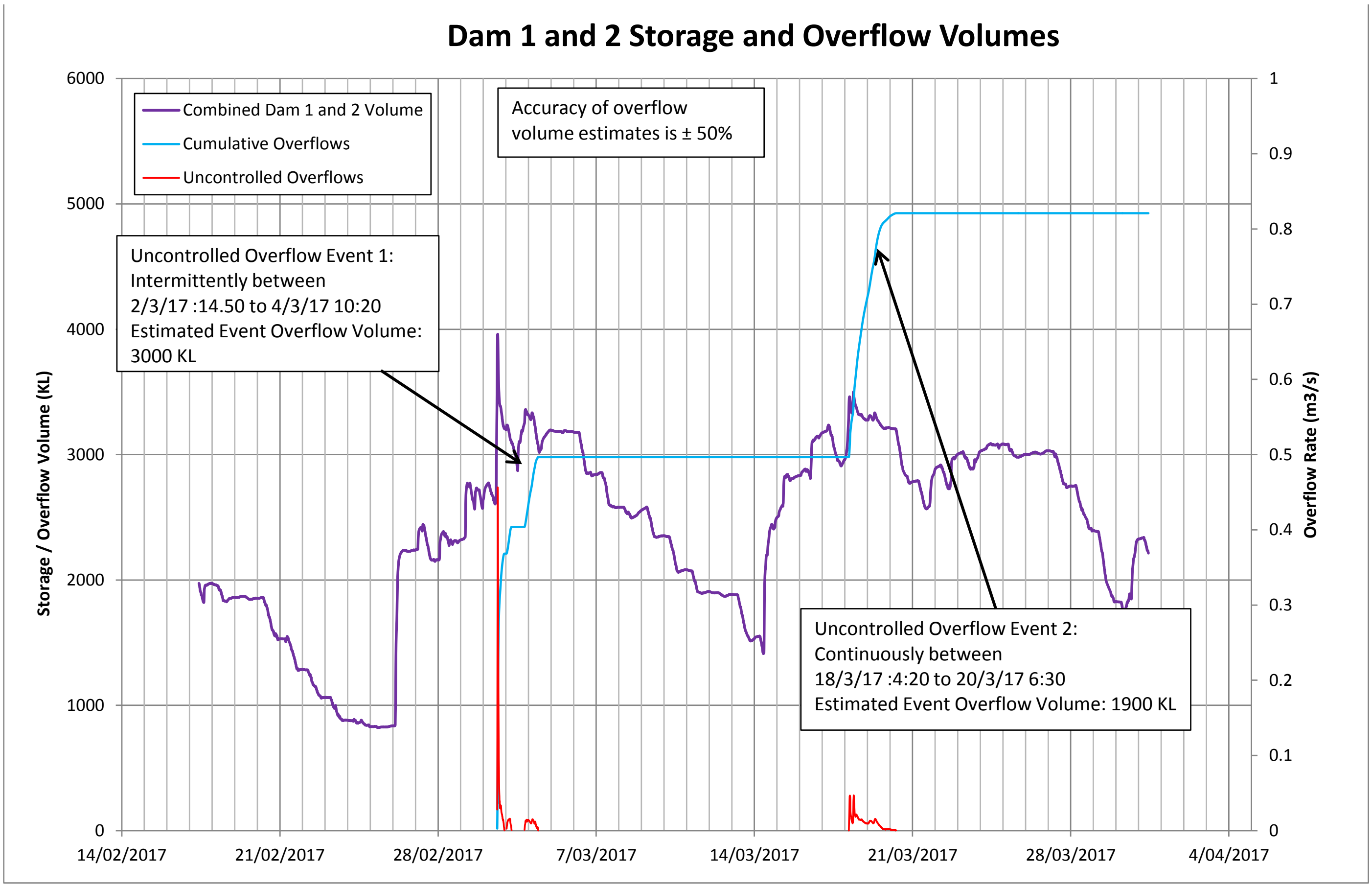


Figure 11 – *Calculated Dam 1 and 2 storage volumes and Dam 2 overflow rates and volumes.*

As indicated in **Figure 11**, the combined dam storage levels fluctuated between 900 and 3,000 KL over the period. Two independent overflow events were recorded on 2-4 March and 18-20 March. It is estimated that 3,000 KL overflowed during the first event and 1,900 KL overflowed during the second event.

Photo 2 shows inflows into Dam 2 during the peak of the 2 March overflow event. Dam 2 is expected to have overflowed at a similar rate during this event.

Photo 2 – *Shows inflows into Dam 2 during the peak of the 2 March 2017 overflow event. Dam 2 is expected to have overflowed at a similar rate during this event.*

Process Water Use Data

Boral estimated daily process water use volumes over the period at the following usage points:

- **Stab Plant**: water use includes conveyor dust suppression and irrigation of some stockpiles via a fixed sprinkler system. Water use was measured by a cumulative flow meter.
- **Fixed Plant**: water use includes conveyor dust suppression and irrigation of some stockpiles via a fixed sprinkler system. Water use was measured by a cumulative flow meter.
- **Water Cart Use**: water use includes haul road and stockpile dust suppression (via a water cannon). Water use was estimated by counting the number of daily water cart loads.
- **Offsite Tanker**: refers to water exported off site by a licensed waste management contractor. Water export volumes were measured by the contractor.

Figure 12 plots the estimated gross process water use over the period.

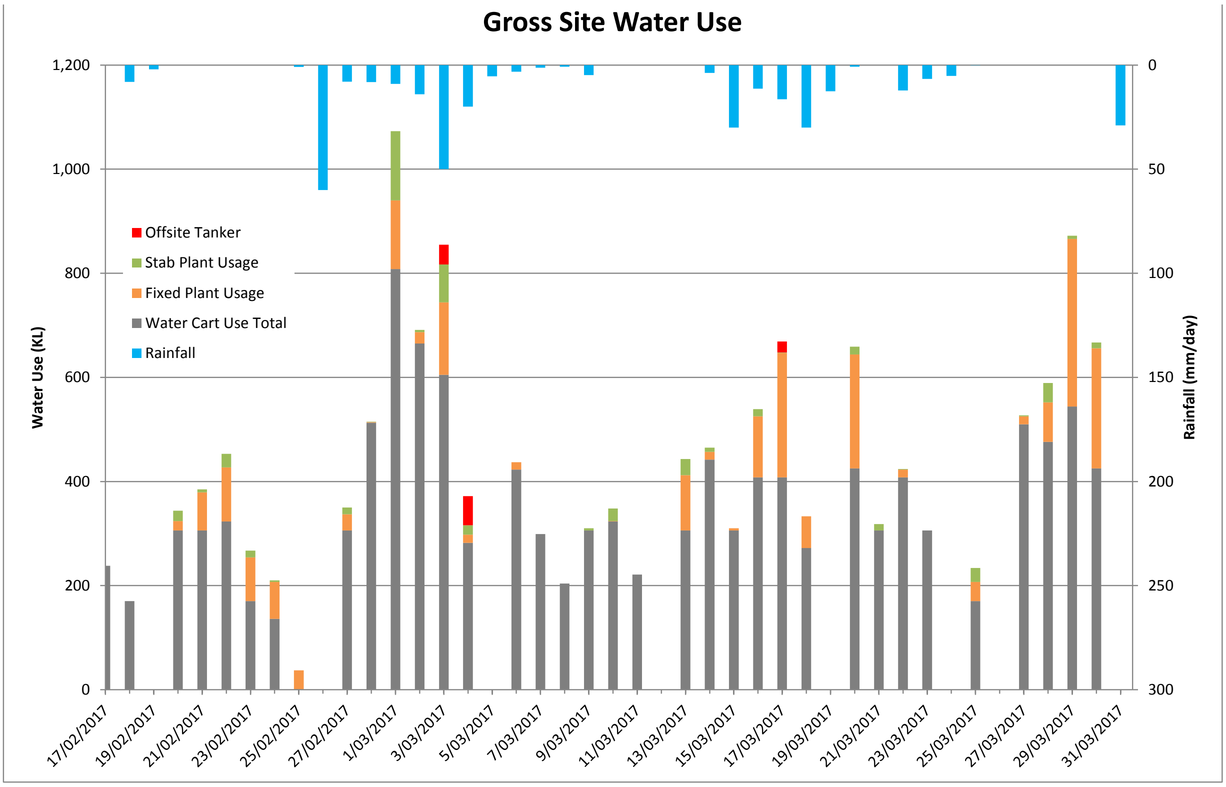


***Figure 12** – Gross Process Water Usage*

Water balance calibration indicated that on some days, water usage was less than the volumes estimated by Boral, indicating that some applied water returns to the water management system. Estimates of net process water usage are provided in **Figure 13**. Refer to **Section 5.3** for further details on the model calibration approach.

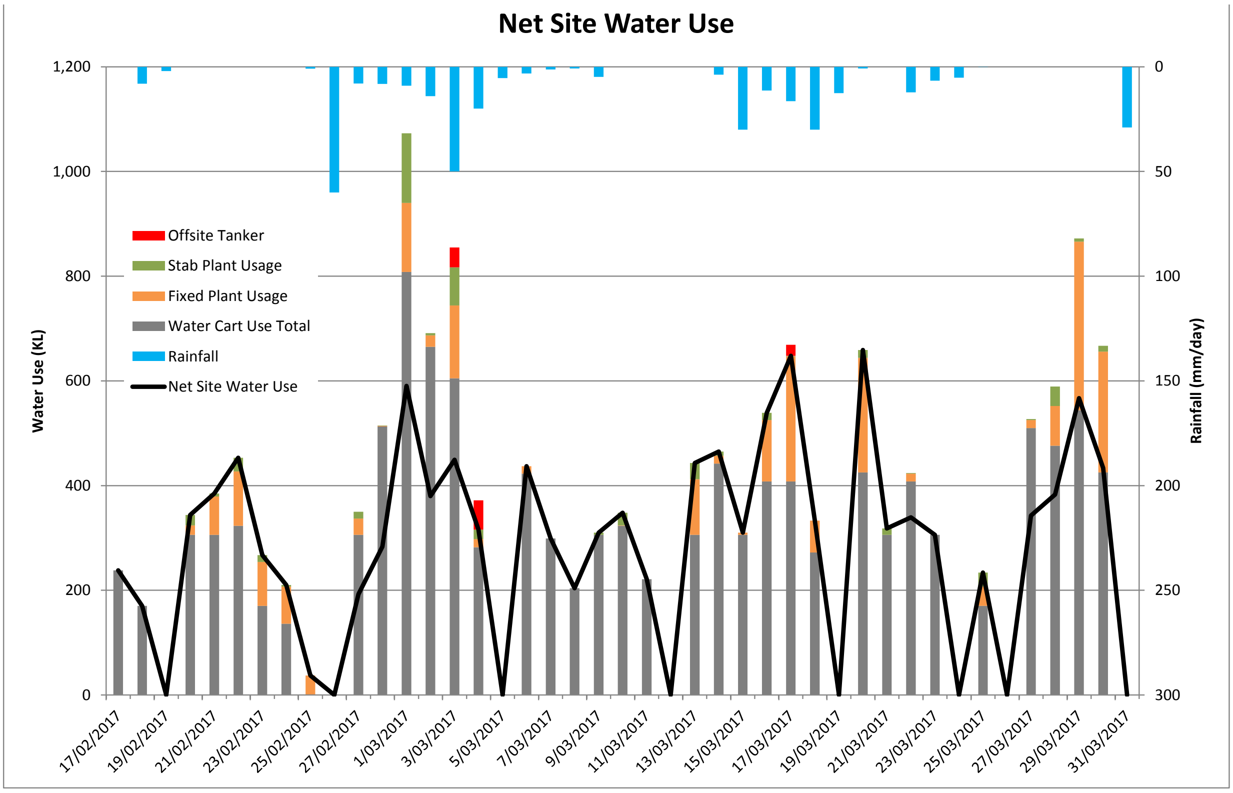


Figure 13 – *Net Process Water Usage*

Inflows from Leaky Mains Pipe

As noted in **Figure 4** a constant flow from what is expected to be a leaky water main seeps into Dam 1. The flow rate was unable to be reliably measured, but was estimated to be 0.8 l/s based on a visual inspection and a review of dam water level data during non-rainfall periods.

5.3 Model Calibration

As mentioned earlier in this section, the key objectives of the model calibration process are to parametrise a reliable rainfall runoff model of the Surface Water Management Area and to establish net process water use profiles. Accordingly, the following calibration approach was applied:

1) Rainfall runoff models were developed using the SIMHYD model for the seven Water Management Area Categories that are discussed in **Table 3-3**. Initially typical parameters were adopted. Parameters were then adjusted until the calculated daily runoff volumes were similar to the change in storage volumes plus Dam 2 overflow volumes that were calculated from water level data (as described in **Section 5.2**). As noted in **Section 5.2**, some adjustments to the assumed rainfall were made during this process.

2) Gross process water use profiles were adjusted to achieve a good overall fit between the simulated and estimated (from water level data) dam storage levels. In particular, the dam storage draw down rate during non-rainfall days was carefully examined to ensure correlation with the assumed process water use rates.

Steps 1 and 2 were iterated a number of times until a good overall fit between the simulated and estimated (from water level data) dam storage levels were achieved. Calibration results are provided in the following charts and tables:

- **Table 5-2** provides the calculated runoff coefficients (C_v) for each of the seven Water Management Area Categories that were established in **Table 3-3**. The average C_v for the 8.6 ha Water Management Area is also provided.

- **Figure 14** shows a calibration summary chart which compares simulated and estimated (from water level data) dam storage levels. The chart also shows the daily rainfall totals, estimated total site runoff, assumed net process water use and estimate overflow volumes.

- **Table 5-3** provides a summary of the total inflows and outflows over the period.

***Table 5-2** – Calculated Runoff Coefficients for each Water Management Area Category*

Category	Area (ha)	Runoff Coefficient (C_v) over the period
Stockpiles	3.2	0.22
Haul Roads	2.1	0.62
Plant Area	0.4	0.62
Building and Car Park	0.6	0.68
General Site Area	0.7	0.54
Vegetated Areas	1.4	0.50
Water Management Basins	0.2	1.00
Total	**8.6**	0.46

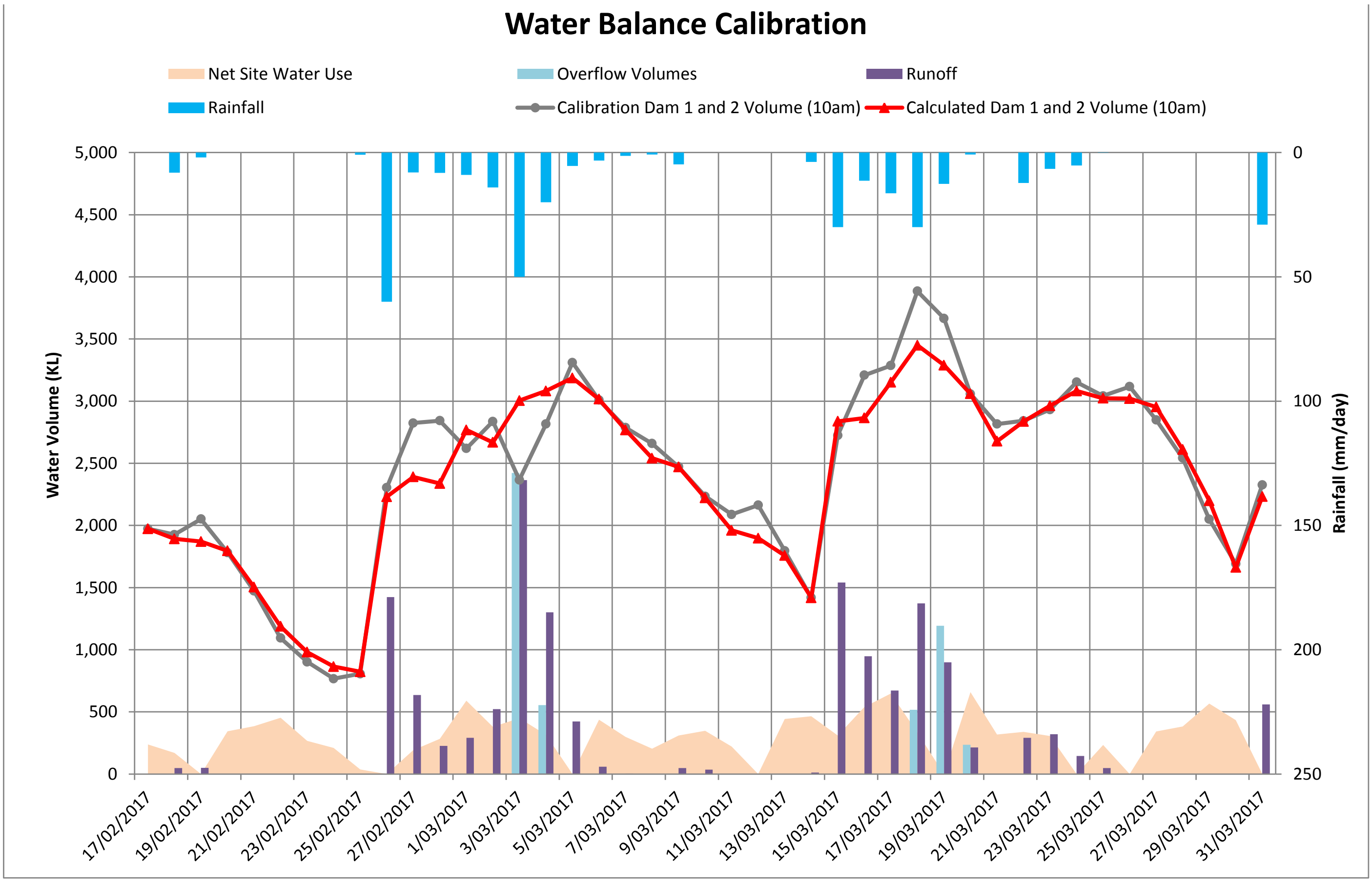


***Figure 14** – Calibration Summary Chart*

Table 5-3 *– Calibration Summary Table*

	Units	**Total over period**	**Comments**
Rainfall	**(mm)**	**370**	
Inflows			
Runoff	(ML)	14.5	46% of rainfall volume
Leaky Pipe	(ML)	3.2	assumed constant rate 0.8 l/s
Total	(ML)	**17.7**	
Outflows			
Net Process Water Use	(ML)	12.5	
Off Site Removal	(ML)	0.1	
Uncontrolled Overflows	(ML)	4.9	34% of runoff
Total	(ML)	**17.5**	
Change in Storage	(ML)	0.2	

The water balance model calibration period comprised persistent wet weather conditions that resulted in two independent overflow events. While it is acknowledged that some of the assumptions applied to model calibration cannot be verified, the calibration process has achieved the following key outcomes:

- Rainfall runoff models for the seven Water Management Area Categories were collectively parametrised to produce runoff volumes over the period that were similar to the change in Dam 1 and 2 storage levels and Dam 2 overflow volumes that were calculated from water level data. The average C_v over the period is estimated to be 0.46. This is a lower than an expected value for an industrial site, and is primarily due to the low runoff potential of stockpiles.

- The calibration process indicates that net process water use volumes were similar to gross volumes on most days. Boral advised that a significant portion of the process water use was applied to the various site stockpiles. Accordingly, the calibration outcome indicates that the application of process water to stockpiles during wet weather conditions is an effective means of reducing dam water levels. Refer to **Section 3.2.6** for a detailed discussion on the water holding potential of the site stockpiles.

- Uncontrolled overflow volumes over the period are estimated to be 4.9 ML, equivalent to 34% of the estimated runoff volumes over the period.

5.4 Assessment Model Development and Verification

The calibrated site water balance model was modified to develop the Assessment Model. As discussed in **Section 5.1**, the Assessment Model applies a continuous simulation approach using daily rainfall data from the Prospect Dam rainfall gauge between the 1990 to March 2017 period. The following sections discuss the model development and verification. Results for the existing water management system and potential options are discussed separately in **Sections 6** and **7** respectively.

5.4.1 Model Development

This section describes the key assumptions applied to the Assessment Model.

Rainfall Runoff Model

The rainfall runoff model that was developed and calibrated during the model calibration process was applied to the Assessment Model without change. However, the lower bound stockpile area (2.6 ha) and higher bound haul road area (2.7 ha) estimates that are provided in **Table 3-3** were conservatively adopted.

Storage Characteristics

The Dam 1 and 2 storages were modelled as a combined storage in the model. The storage volume was varied depending on the scenario assessed.

Process Water Use Profiles

Process water use rates were calculated on a daily basis in the Assessment Model as a function of the prevailing climatic conditions and typical use rates that were established during the model calibration process. **Table 5-4** details the assumptions applied to calculation of daily process water use rates in the Assessment Model .

***Table 5-4** – Process Water Use Rate Assumptions*

Process Water Use Category	Assumptions	Comments
Plant Water Use (conveyor dust suppression)	• Applied at an average daily rate of 40 KL/day, 6 days a week.	Typical use rate provided by Boral
Haul Road Dust Suppression (water cart application)	• Applied 6 days a week. • Assumed 2.6 ha application area. • Daily application rate calculated as (Evaporation Excess[1] + 2mm)	Typical use rate for haul road dust suppression.
Stockpile Dust Suppression (fixed sprinkler systems and water cart cannon)	• Applied 6 days a week. • Only applied when storage levels > 60%. • Assumed 2.5 ha application area. • Daily application rates calculated as (Evaporation Excess[1] + 10mm)	Application rates are 2 to 3 times higher than potential evaporation losses. Accordingly, this modelling approach assumes that a significant portion of the applied water is absorbed by the stockpiled material. Refer to **Section 3.2.6** for further details on the water holding potential of stockpiles.

Note 1: Evaporation Excess = minimum(0, Daily evaporation rate – daily rainfall)

As noted in **Table 5-4**, process water use rates are calculated based on an evaporation excess (climate dependant) and a typical daily use rate (non-climate dependant) . **Figure 15** and **Figure 16** plot the resulting potential daily process water use rates for each calendar month for wet and dry conditions respectively. It is noted that the stockpile dust suppression is only applied when dam storage levels exceed 60%. Hence, average application rates will be well below potential application rates.

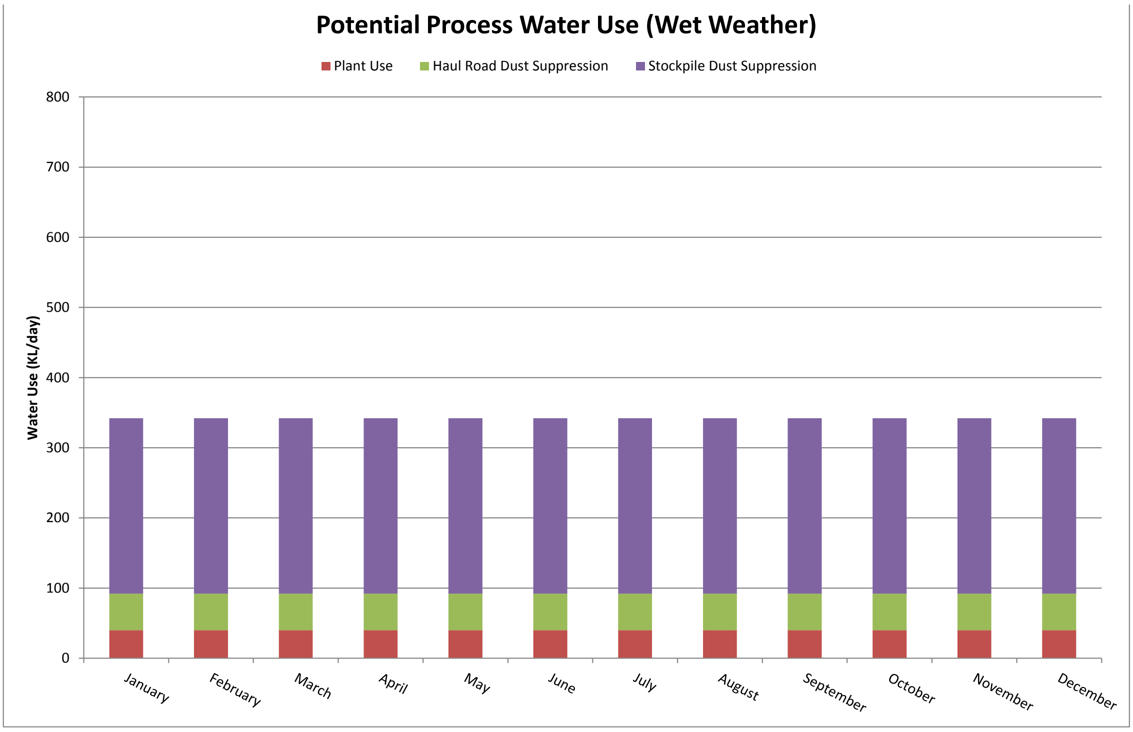


***Figure 15** – Potential Process Water Use Rates (wet weather conditions)*

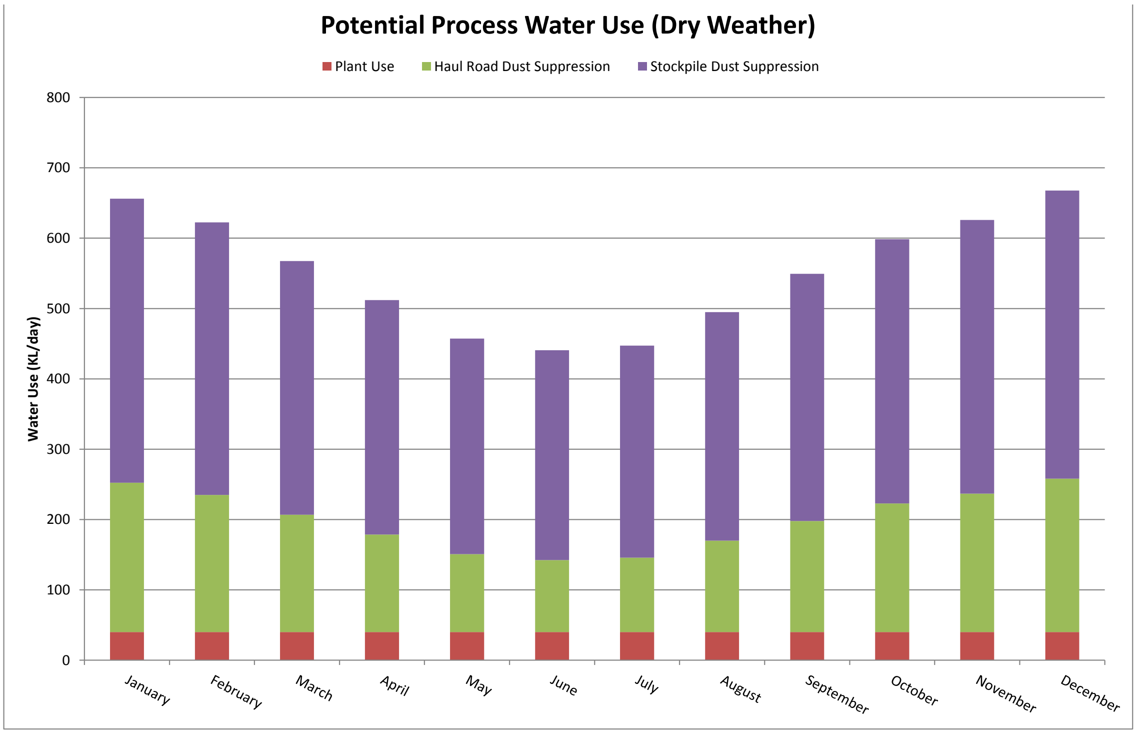


***Figure 16** – Potential Process Water Use Rates (dry weather conditions)*

Overflows

The model assumes that overflows occur when the combined Dam 1 and 2 storage volume is exceeded. Any runoff volume that is in excess of the storage volume is assumed to overflow.

Inflows from Leaky Mains Pipe

As noted in **Figure 4** a constant flow from what is expected to be a leaky water main seeps into Dam 1. The flow rate was unable to be reliably measured, but was estimated to be 0.8 l/s based on a visual inspection and a review of dam water level data during non-rainfall periods.

Potential Groundwater Inflows

EMM installed continuous water pressure sensors in two seepage monitoring bores that were installed in shallow clay to monitor for potential seepage from Dams 1 and 2 and to assess the potential influence of local groundwater levels on the dams. EMM has advised that the water levels in the dams were found to be higher than groundwater levels in the seepage monitoring bores, indicating that the underlying groundwater system is confined and negligible leakage from the dams into the local groundwater system would occur. Accordingly, no groundwater inflow or seepage losses have been applied to the water balance model.

5.4.2 Model Verification

The Assessment Model was verified by comparing the simulated results to the calibration data that is presented in **Section 5.3**. **Figure 17** compares the simulated storage volume, net process water use and overflow volumes to the associated calibration data. This figure demonstrates that the Assessment Model simulates a water balance that is similar to the calibration data, indicating that the Assessment Model has been appropriately parameterised to reproduce the calibration outcomes.

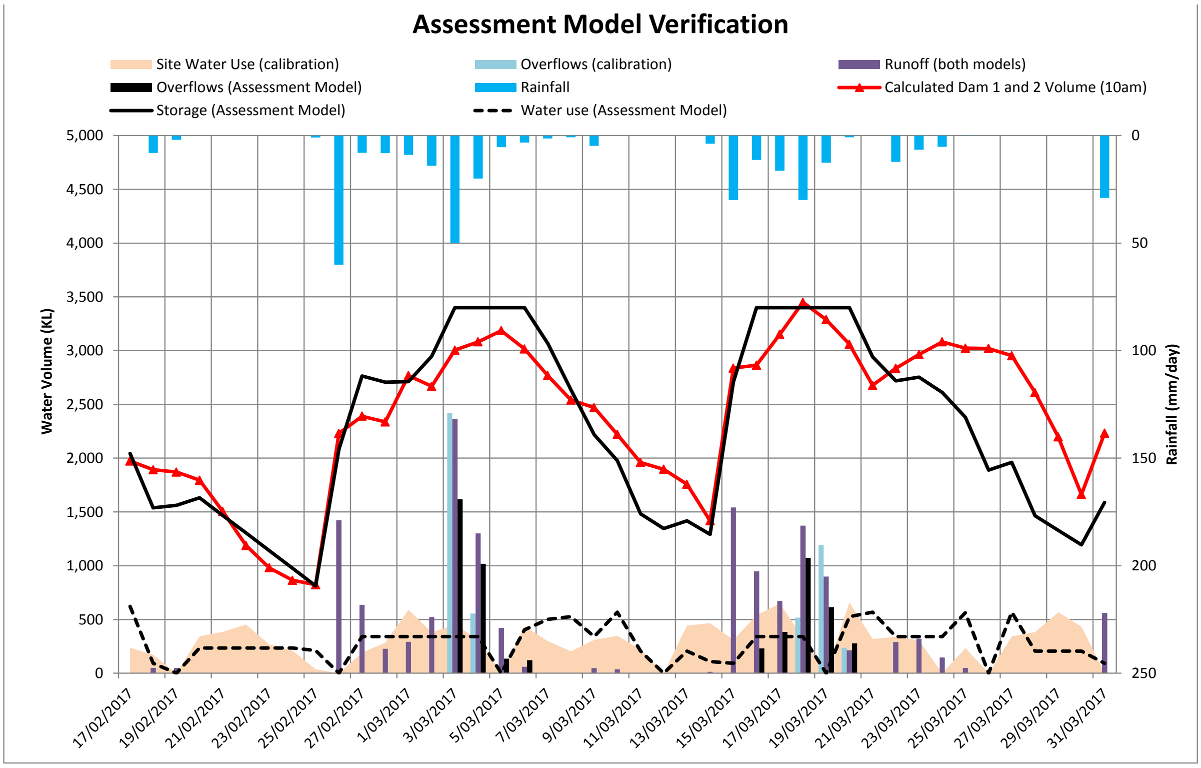


***Figure 17** – Assessment Model Verification Summary Chart*

6 REVIEW OF THE EXISTING SYSTEM

This section reviews the existing water management system and is structured as follows:

- **Section 6.1** documents the water balance results for the existing system.
- **Section 6.2** assesses the water quality risks associated with uncontrolled overflows. This assessment is informed by the outcomes of the SWCA (summarised in **Section 4**) and the water balance results.
- **Section 6.3** reviews the human health risks associated with process water use.

6.1 Water Balance Results

The Assessment Model was applied to assess the performance of the existing water management system. The following two scenarios were assessed:

- **Current Conditions**: Applies the current conditions dam storage volumes that are reported in **Table 3-4**. Dams 1 and 2 were recently dredged which has enabled Boral to use a portion of the sediment storage volume for water storage. The resulting Water Storage Volume is 2.5 ML.
- **Medium Term Conditions (Base Case)**: Applies the medium term dam storage volumes that are reported in **Table 3-4**. The medium term Water Storage Volume was reduced to 1.8 ML to reflect the expected accumulation of sediment overtime. The medium term conditions results have been adopted as the base case for assessing the effectiveness of potential improvement options.

General water balance model results are presented in **Section 6.1.1**. **Section 6.1.2** provides detailed analysis of site overflow statistics.

6.1.1 General Model Results

Water balance models results are provided in the following tables:

- **Table 6-1** compares the runoff coefficients (C_v) calculated for the calibration period to the long term C_v values that were calculated from the Assessment Model.
- **Table 6-2** provides a summary of annualised water balance results for the Current and Medium Term Conditions scenarios. The results are presented for typical dry, average and wet years.

Table 6-1 – *Calculated Runoff Coefficients for each Water Management Area Category*

Category	Area (ha)	Runoff Coefficient (C_v) (calibration period)	Runoff Coefficient (C_v) (Assessment Model: Long Term)
Stockpiles	3.2	0.22	0.17
Haul Roads	2.1	0.62	0.42
Plant Area	0.4	0.62	0.45
Building and Car Park	0.6	0.68	0.56
General Site Area	0.7	0.54	0.30
Vegetated Areas	1.4	0.50	0.28
Water Management Basins	0.2	1.00	1.00
Total	**8.6**	**0.46**	**0.32**

Table 6-2 – *Water Balance Results Summary*

		Current Conditions (post dredging)			**Medium Term Conditions** (base model)		
	Units	Dry Year	Avg Year	Wet Year	Dry Year	Avg Year	Wet Year
Rainfall	(mm)	600	830	1030	600	830	1030
Inflows							
– Runoff	(ML/year)	11	23	34	11	23	34
– Inflows from Leaky Water Main	(ML/year)	27	27	27	27	27	27
Total inflows	(ML/year)	38	50	61	38	50	61
Outflows							
– Process Water Use	(ML/year)	37	42	49	36	41	48
– Overflows	(ML/year)	1	8	11	1	8	12
– Controlled Discharges	(ML/year)	0	0	0	0	0	0
Total Outflows	(ML/year)	38	50	62	37	49	62
Inflows – Outflows (change in storage)	(ML)	0	0	(1)	1	1	(1)

Model results presented in **Table 6-1** and **Table 6-2** indicate that:

- The average annualised C_v from the 8.6 ha Water Management Area is estimated to be 0.32. This is a lower than expected value for an industrial site, and is primarily due to the low runoff potential of stockpiles.

- Constant inflows from what Boral expects to be a leaky water main contribute significantly to the annual water make.

- Runoff, overflows and process water use volumes are higher in wetter years, as expected.

- Process water use volumes are more than 80% of total inflows in all years.

- Overflow volumes range from less than 5% of inflow volumes in dry years to approximately 20% of inflow volumes in wet years. Overflow characteristics are discussed further in **Section 6.1.2**.

6.1.2 Overflow Analysis

Model results for predicted overflows are presented using the following statistics:

- **Average Overflow Volume:** refers to the average annual overflow volume calculated by the Assessment Model.

- **Average Overflow Frequency**: refers to the average number of days per year that overflows are predicted to occur. As this is an average, the overflow frequency is expected to be higher in wet years and lower in dry years.

- **Average non-compliant Overflows**: refers to the average number of days per year that overflows are predicted to occur when the proceeding 5 day rainfall is less than 45mm. These overflow events are not compliant with EPL Condition L1.2.

- **Average Coefficient of Overflow (C_{OF})**: refers to the percentage of the runoff volume that overflows from the facility.

These statistics are used to compare the benefits of the potential improvement options that are discussed in **Section 7**. **Table 6-3** presents the overflow statistics for the Current and Medium Term Conditions scenarios.

Table 6-3 – *Overflow Statistics: Existing Water Management System*

	Units	Current Conditions (post dredging)	Medium Term Conditions (base model)
Overflow Statistics			
Average Overflow Volume	(ML/year)	6.9	7.8
Average Overflow Frequency	(days/year)	7.0	8.4
Average non-compliant Overflows	(days/year)	0.12	0.28
Average C_{OF}[1]	(%)	29%	32%

Note 1: C_{OF} refers to the percentage of runoff volume that overflows from the facility.

The overflow statistics presented in **Table 6-3** indicate that:

- On average, overflows will occur on 7 to 8 days a year.
- There is a low probability of non-compliant overflows occurring.
- On average, overflow volumes are estimated to be equivalent to 29 to 32% of the total runoff volume.
- The additional Water Storage Volume that is temporarily available due to the recent dredging moderately reduces the volume and frequency of overflows by approximately 10 to 15%.

The Base Model (i.e. medium term conditions) predicts that 227 overflow days would have occurred over the 27 year 4 month simulation period. 7 of the 227 overflow days are predicted by the model to have occurred when the proceeding 5 day rainfall total was less than 45mm.

Figure 18 plots the total overflow volume and the proceeding 5 day rainfall depth for each of the 227 overflow days. The results are sorted from the lowest to highest 5 day rainfall depth. Accordingly, results for the 7 non-compliant overflow days are located to the left of the chart. As noted on the chart, the overflow volumes from the 7 non-complaint overflows ranged from 67 to 243 KL. These volumes are considered to be minor in the context of the greater water balance and it is therefore expected that Boral could implement short-term measures such as increased process water application or disposal offsite to licensed waste management contractor to avoid a non-compliant overflow.

Accordingly, the water balance model results indicate that broadly the water management system complies with EPL Condition L1.2, which permits overflows when the 5 day rainfall total exceeds 45mm.

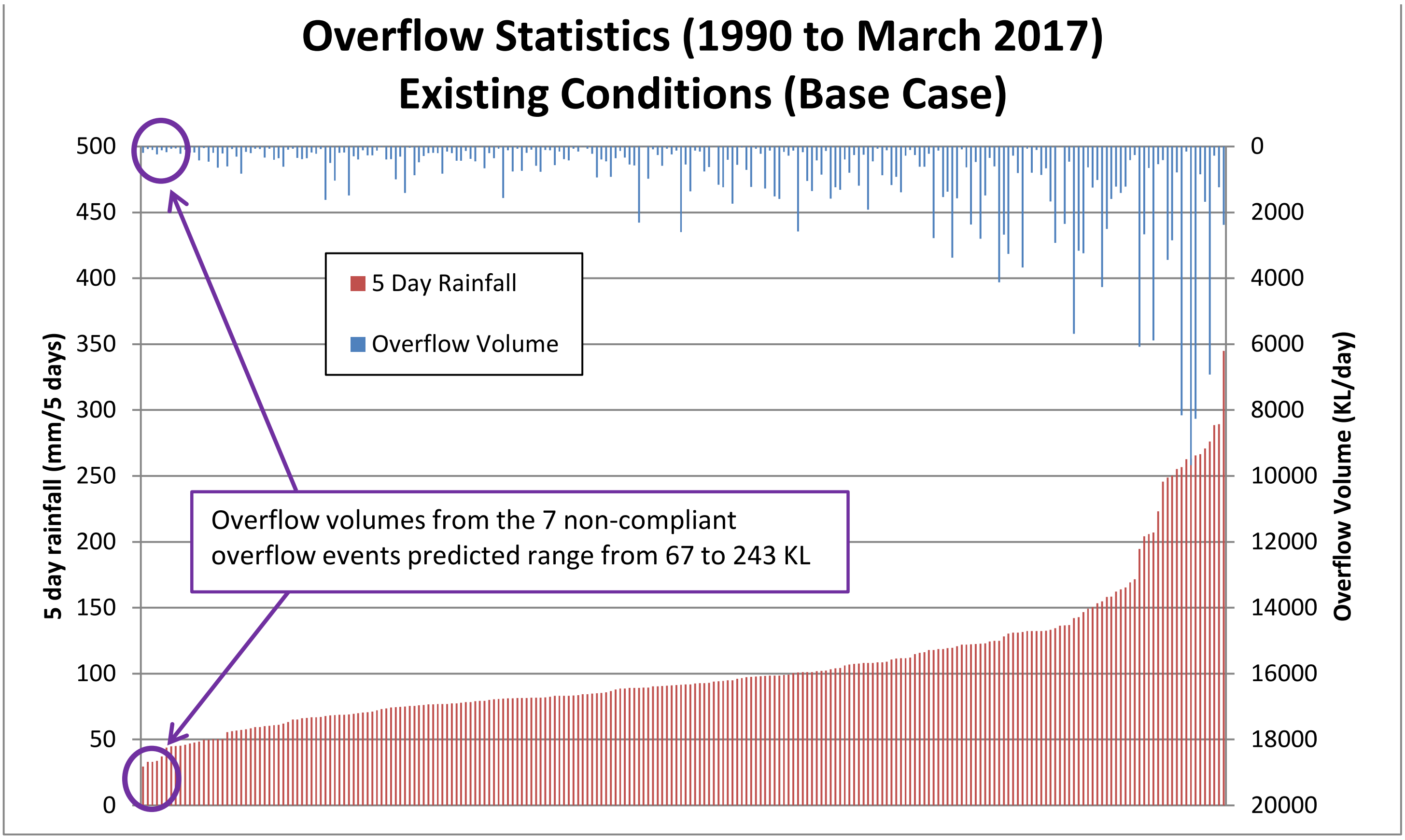


***Figure 18** – Overflow Statistics*

6.2 Potential Receiving Water Impacts

The potential for the facility to impact water quality is a function of the overflow regime and the water quality of overflows. Both of these considerations are discussed further below.

Overflow Considerations

Water balance results presented in **Section 6.1** indicate that overflow volumes are estimated to be equivalent to 29 to 32% of total runoff volume. Data from two overflow events that occurred during the calibration period has demonstrated that overflows occur during significant wet weather events, when substantial flows in Prospect Creek would be occurring. For context, Boral provided a photograph of Prospect Creek (adjacent to the site) that was taken on 2 March 2017, during an uncontrolled overflow event. This photograph is provided below as **Photo 3**. The photograph clearly shows that stream flow in Prospect Creek is close to bank full. Accordingly, any overflows are expected to be significantly diluted by stream flows in Prospect Creek.

Photo 3 – *Streamflow in Prospect Creek on 2 March 2017*

Water Quality Considerations

The water quality results presented in **Table 4-1** indicate that concentrations of the listed analytes in Dam 2 during wet weather conditions could potentially exceed the associated trigger values. Similar exceedances are probable in any water that overflows from Dam 2 into Prospect Creek.

Receiving Water Quality Risks

As noted in **Section 3**, the facility's 8.6 ha Water Management Area is equivalent to only 0.8% of the contributing Prospect Creek Catchment area at the facility's overflow location. By virtue of dilution, it is expected that any overflows from the facility will not materially alter the water quality in Prospect Creek during wet weather. However, it is acknowledged that overflows from the facility are likely to contribute to the cumulative degradation of water quality in Prospect Creek during wet weather conditions.

Potential for impacts to Prospect Creek water quality would increase if Dam 2 water is discharged outside of a significant wet weather period (i.e. via controlled discharges). Controlled discharges are currently not permitted by EPL (Condition U1) and no controlled discharges occurred over the water quality monitoring period.

6.3 Human Health Risks

As discussed in **Section 3**, process water is sourced from Dam 2 and is used for haul road, stockpile and conveyor dust suppression. The majority of the stockpile dust suppression is achieved using a water cannon that is mounted on a water cart (as shown on the report cover). Monitoring undertaken to inform the SWCA (RHDHV, 2017) identified elevated counts of Total Coliforms and Total Plates in some Dam 2 samples, indicating there is potential for pathogens to exist in process water. Accordingly, there is a material risk that site staff and visitors could be exposed to air-borne pathogens that may exist in process water.

Boral currently irrigate treated waste water effluent to vegetated areas around the Dams 1 and 2. This may be the source of the elevated counts of Total Coliforms and Total Plates in some Dam 2 samples. Boral propose to investigate potential measures to reduce the identified risks. Potential measures include relocating the effluent irrigation area and/or adding an appropriate disinfectant dosing system to the process water system.

7 OPTIONS REVIEW

A key aspect of the SWMMP is to identify and assess potential water management system improvement works that could be practically implemented by Boral to reduce non-compliance and receiving water quality risks. This section identifies and reviews a number of potential water management system improvement options and is structured as follows:

- **Section 7.1** describes the options assessment approach and selects 6 options for further assessment.
- **Section 7.2** assesses the water management benefits of 6 key options.
- **Section 7.3** presents Boral's proposed water management system improvement strategy. **Section 8** documents a water management system improvement plan that provides further details on the proposed implementation of the strategy.

7.1 Options Assessment Approach

RHDHV, Boral and Victory Engineering reviewed the potential benefits of a wide range of water quality improvement options. Only options that could be practically integrated into the facility's water management system were considered. This review process identified 6 options for further assessment. These options are summarised in **Table 7-1** and discussed in further detail in **Section 7.2**.

***Table 7-1** – Selected Options for Further Assessment*

Option	Description	Water Management Benefits
Option 1	Divert clean water runoff from vegetated batters located to the north of site but within the 8.6 ha Water Management Area.	Reduce runoff volumes to the dams, reducing the frequency and magnitude of overflows.
Option 2	Fix leaky water main to reduce base flow into Dam 1.	Reduce base flow to the dams, reducing the frequency and magnitude of overflows.
Option 3	Options 1 and 2 combined.	Reduce runoff volumes and base flows to the dams, reducing the frequency and magnitude of overflows.
Option 4	Apply process water on Sundays and public holidays during wet weather.	Increases to process water use will reduce the frequency and magnitude of overflows.
Option 5	Upgrade the existing dams to increase storage and water quality treatment potential.	Increased storage is expected to: • Reduce the frequency and magnitude of overflows by increasing the opportunity for water to be used as process water. • Improve the treatment of overflows due to increased residence time.
Option 6	• Upgrade the existing dams to increase storage and water quality treatment potential. • Install a water treatment plant that is designed to progressively dewater the dams. Treated water would be discharged as Controlled Discharge under a modified EPL.	These measures combined are expected to: • Reduce the frequency and magnitude of overflows by progressively dewatering the dam. • Improve the treatment of overflows due to increased residence time.

The following options were reviewed but were not considered to provide material benefit and were therefore not assessed further:

- **Source Controls**: As noted in **Figure 4**, a number of source controls such as sediment pits are integrated into the facility's water management system. The potential for additional source controls such as covering or isolating drainage in portions of the site that may have elevated stormwater pollution risks are not considered practical given the site activities.

- **Dam 2 Water Treatment Systems**: There are a range of proprietary water treatment systems that could be installed in Dam 2 to improve the water quality treatment function of the dam. Options include continuous pump and treat systems and 'in dam' treatment systems such as floating macrophyte beds. These water quality treatment systems are considered have limited potential to provide material treatment during overflow conditions as the average residence time (i.e. the average time water spends in the dam before overflow) in Dam 2 is expected to be less than 12 hours during most overflow events. Typically these systems require residence time in the order of weeks to provide effective water quality improvement.

- **Offsite Transfer of Excess Water**: Offsite transfer of excess water was not considered as there is no facility nearby that could receive any surplus water. Off-site disposal of water to a licensed waste disposal facility (via tanker trucks) will be maintained as a contingency.

7.2 Options Assessment

This section assesses the water management benefits associated with the 6 potential improvement options that are identified in **Table 7-1**. The following information is provided for each option:

- A description of the required works / infrastructure.

- The Assessment Model was modified to reflect the option. The following overflow statistics are provided and compared to similar statistics from the Base Model results that are reported in **Table 6-3**:

    - **Average Overflow Volume:** refers to the average annual overflow volume calculated by the Assessment Model.

    - **Average Overflow Frequency**: refers to the average number of days per year that overflows are predicted to occur. As this is an average, the overflow frequency is expected to be higher in wet years and lower in dry years.

    - **Average non-compliant Overflows**: refers to the average number of days per year that overflows are predicted to occur when the proceeding 5 day rainfall is less than 45mm. These overflow events are not compliant with EPL Condition L1.2.

    - **Average Coefficient of Overflow (C_{OF})**: refers to the percentage of the runoff volume that overflows from the facility.

- Any water treatment benefits associated with the option are described qualitatively.

7.2.1 Option 1 – Clean Water Diversion

The site drainage plan that is provided in **Figure 5** shows the 8.6 ha Water Management Area. The northern part of the Water Management Area comprises a steep vegetated batter that is located to the north of the site. Runoff from this vegetated area is expected to be clean and does not require management. The drainage in the northern portion of the site was inspected by RHDHV. This inspection identified the potential to construct a clean water diversion to divert runoff from a 0.6ha portion of the vegetated area to the existing gully that is located to the west of the facility.

The Assessment Model was applied to assess the benefits of the Option 1 works. The only change made to the Assessment Model (Base Case) was the Vegetated Area category was reduced by 0.6ha (i.e. from 1.4ha to 0.8ha). **Table 7-2** provides a summary of key overflow statistics and water treatment benefits.

Table 7-2 – *Option 1: Water Management Benefit Summary*

	Units	Existing Conditions (base model)	Option 1 Results	Benefit
Overflow Statistics				
Average Overflow Volume	(ML/year)	7.8	6.9	12% reduction
Average Overflow Frequency	(days/year)	8.4	8.1	4% reduction
Average non-compliant Overflows	(days/year)	0.28	0.16	43% reduction
Average C_{OF}[1]	(%)	32%	30%	7% reduction
Water Treatment Benefits (during overflow conditions)				
The clean water diversion will reduce runoff volumes entering the water management dams. This will increase the residence time provided during overflow events. It is expected that this will result in a minor improvement in the water quality treatment function provided by the dams.				

Note 1: C_{OF} refers to the percentage of runoff volume that overflows from the facility.

The Option 1 results presented in **Table 7-2** indicate that the clean water diversion will reduce overflow volumes by 12%, resulting in a material reduction in the water quality risks to receiving waters.

7.2.2 Option 2 – Fixing the Leaky Water Main

As noted in **Figure 4** and discussed in **Section 5** (model calibration), constant flow from what is expected to be a leaky water main seeps into Dam 1. The flow rate was unable to be reliably measured, but was estimated to be 0.8 l/s based on a visual inspection and a review of dam water level data during non-rainfall periods. This equates to 75 KL/day or 27 ML/year. Boral intends to investigate the potential to fix the leaky water main.

The Assessment Model was applied to assess the benefits of the Option 2 works. The only change made to the Assessment Model (Base Case) was to reduce the assumed base flows into Dam 1 from 75 to 30 KL/day. A 30KL/day base flow was maintained as it is unclear if there are other sources of base flow that contribute to the basin. **Table 7-3** provides a summary of key overflow statistics and water treatment benefits.

Table 7-3 – *Option 2: Water Management Benefit Summary*

	Units	Existing Conditions (base model)	Option 2 Results	Benefit
Overflow Statistics				
Average Overflow Volume	(ML/year)	7.8	7.2	8% reduction
Average Overflow Frequency	(days/year)	8.4	8.1	4% reduction
Average non-compliant Overflows	(days/year)	0.28	0.08	71% reduction
Average C_{OF}[1]	(%)	32%	30%	7% reduction
Water Treatment Benefits (during overflow conditions)				
Reducing base flows is not expected result in any material improvement in the water quality treatment function provided by the dams as there will be negligible change to the residence time provided during overflow events.				

Note 1: C_{OF} refers to the percentage of runoff volume that overflows from the facility.

The Option 2 results presented in **Table 7-3** indicate that fixing the leaky water main will reduce overflow volumes by 8%, resulting in a material reduction in the water quality risks to receiving waters. It is noted that the facility is more likely to experience water shortages during dry conditions if the constant base flows are reduced or ceased.

7.2.3 Option 3 – Options 1 and 2 Combined

Option 3 assesses the combined benefit of Options 1 and 2. The Assessment Model was applied to assess the benefits of Option 3, with relevant changes made to the model. **Table 7-4** provides a summary of key overflow statistics and water treatment benefits.

Table 7-4 – *Option 3: Water Management Benefit Summary*

	Units	Existing Conditions (base model)	Option 3 Results	Benefit
Overflow Statistics				
Average Overflow Volume	(ML/year)	7.8	6.3	19% reduction
Average Overflow Frequency	(days/year)	8.4	7.1	15% reduction
Average non-compliant Overflows	(days/year)	0.28	0.08	71% reduction
Average C_{OF}[1]	(%)	32%	28%	14% reduction
Water Treatment Benefits (during overflow conditions)				
Reducing runoff and base flows will reduce the volume of water entering the water management dams. This will increase the residence time provided during overflow events. It is expected that this will result in a moderate improvement in the water quality treatment function provided by the dams during overflow conditions.				

Note 1: C_{OF} refers to the percentage of runoff volume that overflows from the facility.

The Option 3 results presented in **Table 7-4** indicate that constructing a clean water diversion (Option 1) and fixing the leaky water main (Option 2) will reduce overflow volumes by 19%, resulting in a material reduction in the water quality risks to receiving waters. It is noted that the facility is more likely to experience water shortages during dry conditions if these options are implemented.

7.2.4 Option 4 – Process Water Use 7 Days a Week

The facility does not operate on Sundays and public holidays. This is reflected in the Assessment Model, which only applies process water demands 6 days a week (Monday through to Saturday). There is potential to increase the process water use by running the water cart on Sundays and public holidays during wet weather conditions.

The Assessment Model was applied to assess the benefits of Option 4. The only change made to the Assessment Model (Base Case) was to increase process water use from 6 to 7 days per week. **Table 7-5** provides a summary of key overflow statistics and water treatment benefits.

Table 7-5 – *Option 4: Water Management Benefit Summary*

	Units	Existing Conditions (base model)	Option 4 Results	Benefit
Overflow Statistics				
Average Overflow Volume	(ML/year)	7.8	7.4	5% reduction
Average Overflow Frequency	(days/year)	8.4	7.4	12% reduction
Average non-compliant Overflows	(days/year)	0.28	0.00	100% reduction
Average C_{OF}[1]	(%)	32%	31%	6% reduction
Water Treatment Benefits (during overflow conditions)				
Increasing process water use to 7 days per week is not expected result in any material improvement in the water quality treatment function provided by the dams as there will be negligible change residence time provided during overflow events.				

Note 1: C_{OF} refers to the percentage of runoff volume that overflows from the facility.

The Option 4 results presented in **Table 7-5** indicate that increasing process water use from 6 to 7 days per week will result in a 5% reduction in overflow volumes and a 12% reduction in the number of overflow days. In addition, non-complaint overflows are eliminated, indicating that the 7 predicted non-compliant overflow events in the Base Case Model were attributed to rainfall that occurred on a Sunday.

7.2.5 Option 5 – Increased Storage

Option 5 assesses the potential water management benefits associated with upgrading Dams 1 and 2. Preliminary civil design investigations undertaken by RHDHV indicate that an upgraded dam could have a total storage volume of between 5 to 6ML. Allowing for 1ML of Sediment Storage, the associated Water Storage Volume would be between 4 to 5ML. As discussed in **Section 3**, the existing dams have an estimated Water Storage Volume of 2.5ML. Hence, a dam upgrade has the potential to substantially increase storage volumes. It is noted that detailed engineering investigations are required to establish the extent and nature of any dam upgrades.

Upgraded dams could also be designed to provide more effective sedimentation treatment by replacing the existing pipe transfer between Dams 1 and 2 with a weir overflow arrangement. The increased residence time associated with the larger volume will also benefit the dam’s water quality function during overflow conditions.

The Assessment Model was applied to assess the benefits associated with potential storage increases. The following two configurations were assessed:

- Increases in the Water Storage Volume to 3, 4, 5 and 6 ML with no other changes.
- Increases in the Water Storage Volume to 3, 4, 5 and 6 ML combined with Options 1 and 2.

Table 7-6 provides a summary of key overflow statistics and water treatment benefits for the above scenarios.

Table 7-6 – *Option 5: Water Management Benefit Summary*

	Units	Existing Conditions (base model)	Option 5 Results and Benefit							
			3ML[2]		4ML[2]		5ML[2]		6ML[2]	
Overflow Statistics (storage increase only)										
Average Overflow Volume	(ML/year)	7.8	5.9	24% reduction	4.5	42% reduction	3.6	54% reduction	3.0	62% reduction
Average Overflow Frequency	(days/year)	8.4	5.9	30% reduction	4.3	49% reduction	3.0	64% reduction	2.5	70% reduction
Average non-compliant Overflows	(days/year)	0.28	0.08	71% reduction	0.08	71% reduction	0.04	86% reduction	0.00	100% reduction
Average C_{OF}[1]	(%)	32%	24%	25% reduction	19%	41% reduction	15%	54% reduction	12%	62% reduction
Overflow Statistics (storage increase combined with Options 1 and 2)										
Average Overflow Volume	(ML/year)	7.8	4.5	42% reduction	3.3	58% reduction	2.6	67% reduction	2.1	73% reduction
Average Overflow Frequency	(days/year)	8.4	4.7	44% reduction	3.1	63% reduction	2.1	75% reduction	1.6	80% reduction
Average non-compliant Overflows	(days/year)	0.28	0.00	100% reduction	0.00	100% reduction	0.00	100% reduction	0.00	100% reduction
Average C_{OF}[1]	(%)	32%	20%	38% reduction	15%	54% reduction	12%	63% reduction	9%	72% reduction
Water Treatment Benefits (during overflow conditions)										
Substantial improvements in the water quality treatment function of the dams during overflow conditions would be expected due to increase in residence time and general improvements to the dam design. The magnitude of the improvement will increase with the larger storage volume scenarios and the reduced inflows associated with Options 1 and 2.										

Note 1: C_{OF} refers to the percentage of runoff volume that overflows from the facility.

Note 2: The storage volume refers to the Water Storage Volume only. An additional 1ML of sediment storage volume would be required.

The Option 5 results presented in **Table 7-6** indicate that increasing the Water Storage Volume by between 3 to 6 ML would reduce overflow volumes by 24 to 62% respectively. When combined with Options 1 and 2, the reduction in overflow volumes increases to 42 to 73% respectively. When combined with the expected improvements to the dam's water treatment functionality during overflow conditions, the Option 5 concept is expected to substantially reduce the water quality risks to receiving waters.

7.2.6 Option 6 - Water Treatment Plant with Storage Increases

Option 6 assesses the potential water management benefits associated upgrading Dams 1 and 2, combined with establishing a water treatment plant that is designed to dewater and treat water stored within the water management dams. The water treatment plant would discharge treated water to Prospect Creek as controlled discharge. This would require amendments to the existing EPL.

Victory Engineering advised that a water treatment plant with a 5 l/s or 430 KL/day capacity could be expected to reduce the concentrations of analytes of concern that were identified by SWCA (RHDHV, 2017) by approximately 90%. This is subject to verification at detailed design.

The Assessment Model was applied to assess the water balance benefits associated with potential storage increases combined with a water treatment plant. The model was configured so that the water treatment plant dewaters the upper 50% portion of the storage volume, with the lower 50% portion of the volume reserved for process water use and sediment storage. This concept is depicted in **Figure 19**.

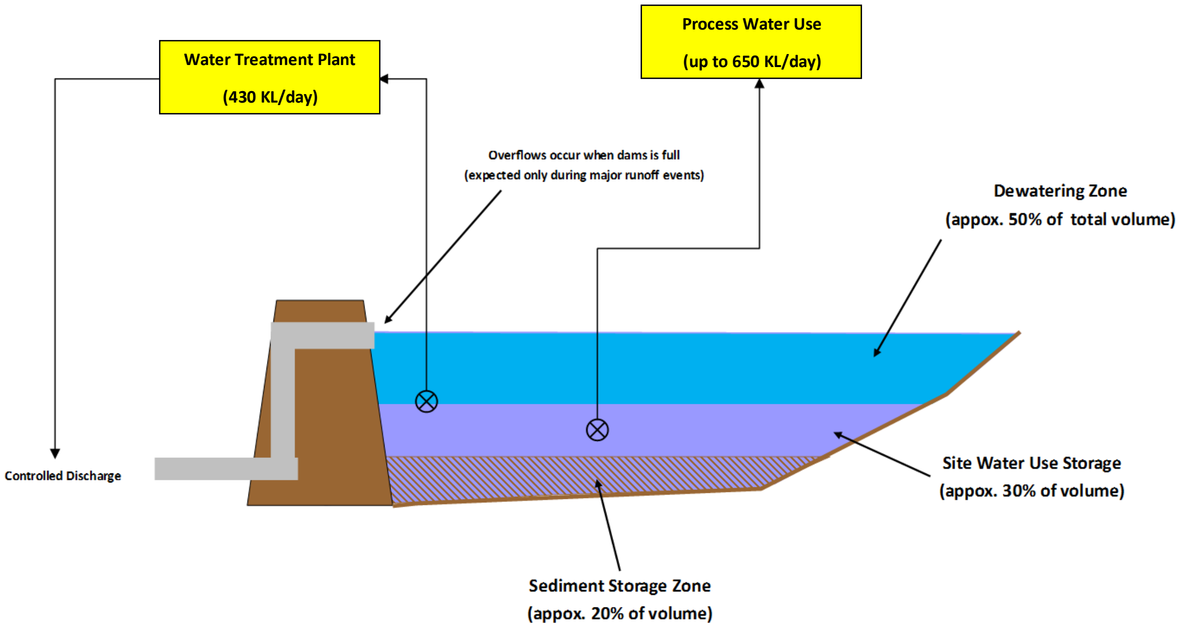


Figure 19 *– Assumed Water Treatment Plant Functionality*

The Assessment Model was applied to assess a water treatment plant operating in conjunction with increases in the Water Storage Volume to 3, 4, 5 and 6 ML. No other changes were made to the water balance assumptions. **Table 7-7** provides a summary of key overflow and controlled discharge statistics and water treatment benefits for the above scenarios.

Table 7-7 – *Option 6: Water Management Benefit Summary*

	Units	**Existing Conditions** (base model)	**Option 6 Results and Benefit**							
			3ML[3]		**4ML[3]**		**5ML[3]**		**6ML[3]**	
Overflow Statistics										
Average Overflow Volume	(ML/year)	7.8	4.3	45% reduction	3.3	58% reduction	2.6	67% reduction	2.0	74% reduction
Average Overflow Frequency	(days/year)	8.4	3.5	58% reduction	2.5	70% reduction	1.7	80% reduction	1.1	87% reduction
Average non-compliant Overflows	(days/year)	0.28	0.00	100% reduction	0.00	100% reduction	0.00	100% reduction	0.00	100% reduction
Average C_{OF}[1]	(%)	32%	18%	44% reduction	14%	57% reduction	11%	66% reduction	8.3%	74% reduction
Controlled Discharge Statistics										
Average Discharge Volume	(ML/year)	Nil	5.6	N/A	5.8	N/A	5.6	N/A	5.2	N/A
Average Discharge Frequency	(days/year)	Nil	13.0	N/A	13.4	N/A	13.1	N/A	12.2	N/A
Average C_D[2]	(%)	Nil	23%	N/A	24%	N/A	23%	N/A	22%	N/A
Water Treatment Benefits (during overflow conditions)										
Substantial improvements in the water quality treatment function of the dams during overflow conditions would be expected due to increase in residence time and general improvements to the dam design.										

Note 1: C_{OF} refers to the percentage of runoff volume that overflows from the facility.

Note 2: C_D refers to the percentage of runoff volume that is discharged from the facility.

Note 3: The storage volume refers to the Water Storage Volume only. An additional 1ML of sediment storage volume would be required.

The Option 6 results presented in **Table 7-7** indicate that increasing the Water Storage Volume by between 3 to 6 ML combined with a 430 KL/day treatment plant would reduce overflow volumes by 44 to 74% respectively. Controlled discharge volumes are estimated to range between 22 to 24% of total runoff. These results demonstrate that storage volume increases combined with a water treatment plant can substantially reduce the water quality risks to receiving waters.

7.3 Preferred Options

Comparison of the potential water management benefits of the options presented in **Section 7.2** indicates that Options 1, 2 and 4 will provide modest benefits, with overflow volumes reducing by between 5 to 12%. Option 5 combined with Options 1 and 2 will provide substantial benefits with overflow volumes reducing by 42 to 73%, depending on the adopted storage size. Option 6 is expected to provide a similar benefit magnitude for an equivalent storage size. By way of example, **Table 7-8** compares the key overflow statistics for the 4ML Water Storage Volume scenario for Options 1, 2 and 5 (combined) and Option 6.

***Table 7-8** – Comparison of Option 1, 2 and 5 to Option 6*

	Units	Option 1, 2 & 5 (combined) Results	Option 6 Results
Overflow Statistics (4ML Water Storage Volume Scenario)			
Average Overflow Volume	(ML/year)	3.3	3.3
Average Overflow Frequency	(days/year)	3.1	2.5
Average non-compliant Overflows	(days/year)	0.00	0.00
Average C_{OF}[1]	(%)	15%	14%

Boral's preferred approach is to:

- Immediately implement Option 1 (clean water diversion) and Option 2 (fix the leaky water main). These works are expected to reduce overflow volumes by 19% and moderately improve the water quality treatment function provided by Dams 1 and 2. As a result, these works are expected to materially reduce receiving water quality risks.

- Subject to the outcomes of further water balance verification and civil design investigations, implement Option 5 (storage increases) with a view of upgrading Dams 1 and 2 to have a Water Storage Volume of 4 ML or greater. When combined with the Option 1 and 2 works, these improvement measures are expected to reduce overflow volumes by 58%. Substantial improvements to the water quality treatment function of the dams during overflow conditions are also expected due to increase in residence time and general improvements to the dam design. Accordingly, Option 5 combined with Options 1 and 2 are expected to significantly reduce receiving water quality risks.

Boral will maintain Option 4 (increased process water use) as an easy to implement short term contingency. Option 6 (storage increases with a water treatment plant) is considered to be contingency measure that could be implemented if future verification indicates that the Water Management System is not operating within the facility's consent and EPL conditions.

Section 8 provides a detailed Water Management Improvement Plan that is proposed by Boral.

8 WATER MANAGEMENT IMPROVEMENT PLAN

Table 8-1 itemises Boral's proposed Water Management Improvement Plan.

Table 8-1 *– Water Management Improvement Plan*

Action	Objective	Timing[1]
Phase 1 – Near Term Actions		
A1.1 – Implement Option 1 (clean water diversion).	Reduce receiving water quality risks.	Within 3 months
A1.2 – Implement Option 2 (fix leaky water main) if possible.	Reduce receiving water quality risks.	Within 3 months
A1.3 – Investigate and implement measures to reduce the risk of human exposure to airborne pathogens associated with process water use.	Reduce the risks of human exposure to airborne pathogens associated with process water use.	Within 3 months
A1.4 – Continue to collect data for water balance calibration.	To inform future water balance calibration and verification.	Ongoing
A1.5 – Implement the surface water monitoring plan that is described in **Section 9**.	To monitor the effectiveness of the water management system.	Immediately
Phase 2 – Medium Term Actions		
A2.1 – Recalibrate the water balance using 6 months of data and verify the outcomes of this report.	To improve confidence in the water balance outcomes prior to Boral making a significant investment in stormwater management infrastructure upgrades.	Within 6 months
A2.2 – Prepare preliminary civil designs for the preferred Dam 1 and 2 upgrade concept.	To provide reliable information on the key characteristics of an upgraded water management dam.	Within 6 months
A2.3 – Update this SWMMP to reflect the outcomes of A2.1 and A2.2.	To update the plan to reflect the outcomes of the water balance calibration and civil design.	Within 6 months
A2.4 – Recommend amendments to EPL and Consent Conditions.	To revise EPL and consent conditions to reflect the final SWMMP.	Within 6 months
Phase 3 – Long Term Actions		
A3.1[1] – Complete upgrades to Dams 1 and 2.	Reduce receiving water quality risks.	Within 1 year

Note 1: Action A3.1 is subject to favourable outcomes from A2.1, A2.2 and A2.3.

Note 2: Timeframes are from government acceptance of the outcomes of this SWMMP.

9 MONITORING, MAINTENANCE AND CONTINGENCY PLANS

9.1 Surface Water Monitoring Plan

Boral propose to implement a surface water monitoring program that includes:

- Monitoring of site rainfall.
- Monitoring of dam water levels and overflows.
- Monitoring of daily process water use volumes.
- Water quality monitoring during overflow conditions.

The objective of the monitoring plan is to collect data to enable:

- The occurrence, duration and volume of site overflows to be estimated.
- The quality of surface water during overflow conditions to be characterised.
- The site water balance model to be progressively updated (as required).
- Compliance with EPL and consent conditions to be assessed.

The surface water monitoring plan is described in the following tables:

- **Table 9-1** details the framework of the plan.
- **Table 9-2** lists analytes that will be monitored. The listed analytes include the majority of the analytes of concern that were established by the SWCA (RHDHV, 2017).
- **Table 9-3** details a reporting plan.

Table 9-1 – *Proposed Surface Water Monitoring Plan Framework*

Aspect	Objective	Monitoring Locations	Monitoring Description
Rainfall Monitoring	To accurately record site rainfall. This information can be used to calibrate the site water balance model and demonstrate compliance with rainfall related consent conditions.	• Within Facility	Boral will operate an onsite weather station that is capable of measuring rainfall.
Process Water Monitoring	Boral will continue to record daily process water use volumes. This information can be used to progressively improve the reliability of model calibration.	• Water cart use • All other process water uses.	Daily process water use volumes are to be recorded either by a cumulative flow meter or a daily tanker load count. Process water usage is to be maintained in a spread sheet.
Water Level Monitoring	To continuously record the water levels in Dams 1 and 2. This data can be used to: • Estimate the occurrence, duration and volume of any site overflows. • Estimate dam storage levels and associated responses to rainfall events and process water use.	• Dam 1 and 2	Boral will continue to operate the water presser sensors that have been installed in Dams 1 and 2. The sensors record water pressure at 10 minute intervals. Dam water levels, storage volumes and overflow volumes can be calculated from this data.
Water Quality Monitoring	To monitor the quality of water within Dams 1 and 2 during overflow conditions. This data can be used to infer water quality risks associated with overflows and the water quality improvement provided by the basin.	• Dam 1 inflows • Dam 2 (near the outlet).	Monitoring is to be undertaken via grab samples at each location. Samples are to be taken during each overflow event[1], up to a total of 4 annual samples. Samples can be taken either during or shortly before or after the occurrence of dam overflows.

Note 1: An overflow event is defined as a period for which overflows occur from Dam 2. An overflow event may comprise intermittent overflows over a period of 2 to 3 days. An overflow event is considered to have ceased when no overflow has occurred for a period of 48 hours. A single sample is required for each overflow event.

Table 9-2 – *Surface Water Quality Monitoring Plan: Analytes Proposed*

	Analytes Proposed
Physical Parameters	• Electrical Conductivity (EC) • Total Suspended Solids (TSS) • Turbidity
Chemical Parameters	• pH • Ammonia, Nitrate (NO_x) and Total Nitrogen (TN) • Reactive and Total Phosphorus (TP) • Metals (Al, As, Ag, B, Ba, Co, Cu, Cr, Cr (IV), Cd, Pb, Mn, Ni, Zn, Mg, Na, K, Ca, Fe, Hg, Sr, Va) • Significant Anions (Cl, SO_4, F) • Hexavalent Chromium • Cyanide • Carbendazim and Anionic Surfactants. • Oil and Grease

Table 9-3 – *Surface Water Quality Monitoring Plan: Reporting*

Action	Scope	Timing
Near Term Reporting **(within the first two years of the Water Management Improvement Plan)**		
Overflow Reporting	Boral will report any overflow event to the EPA and advise if the event complies with relevant EPL conditions.	Within 7 days of an overflow occurring
Water Management System Verification Report	The verification report will review all data collected from the surface water monitoring program. The report will assess the performance of the surface water management system relative to EPL and consent conditions and the trigger values established as part of the SWCA (RHDHV, 2017).	Every 6 months
Long Term Reporting **(after the first two years of the Water Management Improvement Plan)**		
Water Management System Verification Report	The verification report will review all data collected from the surface water monitoring program. The report will assess the performance of the surface water management system relative to EPL and consent conditions and the trigger values established as part of the SWCA (RHDHV, 2017).	Annually

9.2 Contingency Options

Table 9-4 summarises contingency measures that are discussed in the report.

Table 9-4 – *Summary of Contingency Option*

Option	Trigger	Water Management Benefits
Removal of water from Dam 2 by a licensed waste management contractor.	• To be used as a short term contingency at Boral's discretion.	• Removal of water from Dam 2 will reduce the risk of an overflow event occurring.
Operate the water cart on Sundays and Public Holidays	• To be used as a short term contingency at Boral's discretion.	• Increased process water use could be used to reduce the risk of an overflow event occurring.
Construct and operate a water treatment plant	• To be considered by Boral if ongoing verification indicates that the water management system is not operating within EPL and consent conditions.	• Establishment of a controlled discharge regime of treated water will reduce the frequency and magnitude of site overflows.

9.3 Maintenance Plan

Table 9-5 details a maintenance plan for surface water management infrastructure.

Table 9-5 – *Surface Water Management Infrastructure: Maintenance Plan*

Item	Maintenance Tasks
Drainage System Maintenance	Boral will maintain the site drainage in good working order. Ongoing maintenance tasks may include: • Removing accumulated sediment from surface drains (as required) • Removing accumulated sediment from piped drainage (as required). • Repairing or replacing any drainage infrastructure that is damaged or underperforming (as required).
Process Water System Maintenance	Boral will maintain the process water infrastructure in good working order. Ongoing maintenance tasks may include: • Servicing any potential disinfection system (in accordance with manufactures recommendations) • Maintaining pumps and rising mains (as required).
Water Management Dam Maintenance	As discussed in **Section 8**, Boral propose to upgrade Dams 1 and 2. A dam maintenance plan will be prepared with the detailed design documentation. The maintenance plan will include details on the dredging methods and triggers and embankment maintenance.
Monitoring Equipment Maintenance	Boral will maintain the water level loggers and weather station in good working order.

10 REFERENCES

1) Australian and New Zealand Environment Consultation Council (2000), *‘Australian and New Zealand Guidelines for Fresh and Marine Water Quality’*

2) Fletcher et all. (2005), *‘Stormwater Flow and Quality, and the Effectiveness of Non-Proprietary Stormwater Treatment Measures – A Review and Gap Analysis’*

3) Institution of Engineers Australia (2005), *‘Australian Runoff Quality’*

4) Royal HaskoningDHV (2017), *‘Boral Widemere: Surface Water Characterisation Assessment’*

Appendix A – Topographic Survey of Dam 1 and 2 Area

VOLUMES BASIN 1

WATER R.L.	VOLUME (1000L)
38.09	1,489
38.0	1,418
37.9	1,341
37.8	1,265
37.7	1,192
37.6	1,121
37.5	1,051
37.4	984
37.3	918
37.2	854
37.1	792
37.0	732
36.9	675
36.8	619
36.7	566
36.6	516
36.5	469
36.4	424
36.3	382
36.2	343
36.1	306
36.0	271
35.9	239
35.8	209
35.7	182
35.6	156
35.5	133
35.4	112

VOLUMES BASIN 2

WATER R.L.	VOLUME (1000L)
37.52	1,739
37.5	1,718
37.4	1,621
37.3	1,527
37.2	1,435
37.1	1,345
37.0	1,258
36.9	1,173
36.8	1,090
36.7	1,010
36.6	931
36.5	855
36.4	781
36.3	709
36.2	641
36.1	576
36.0	515
35.9	457
35.8	402
35.7	351
35.6	302
35.5	256
35.4	213
35.3	174
35.2	137
35.1	103

MONITORING WELLS

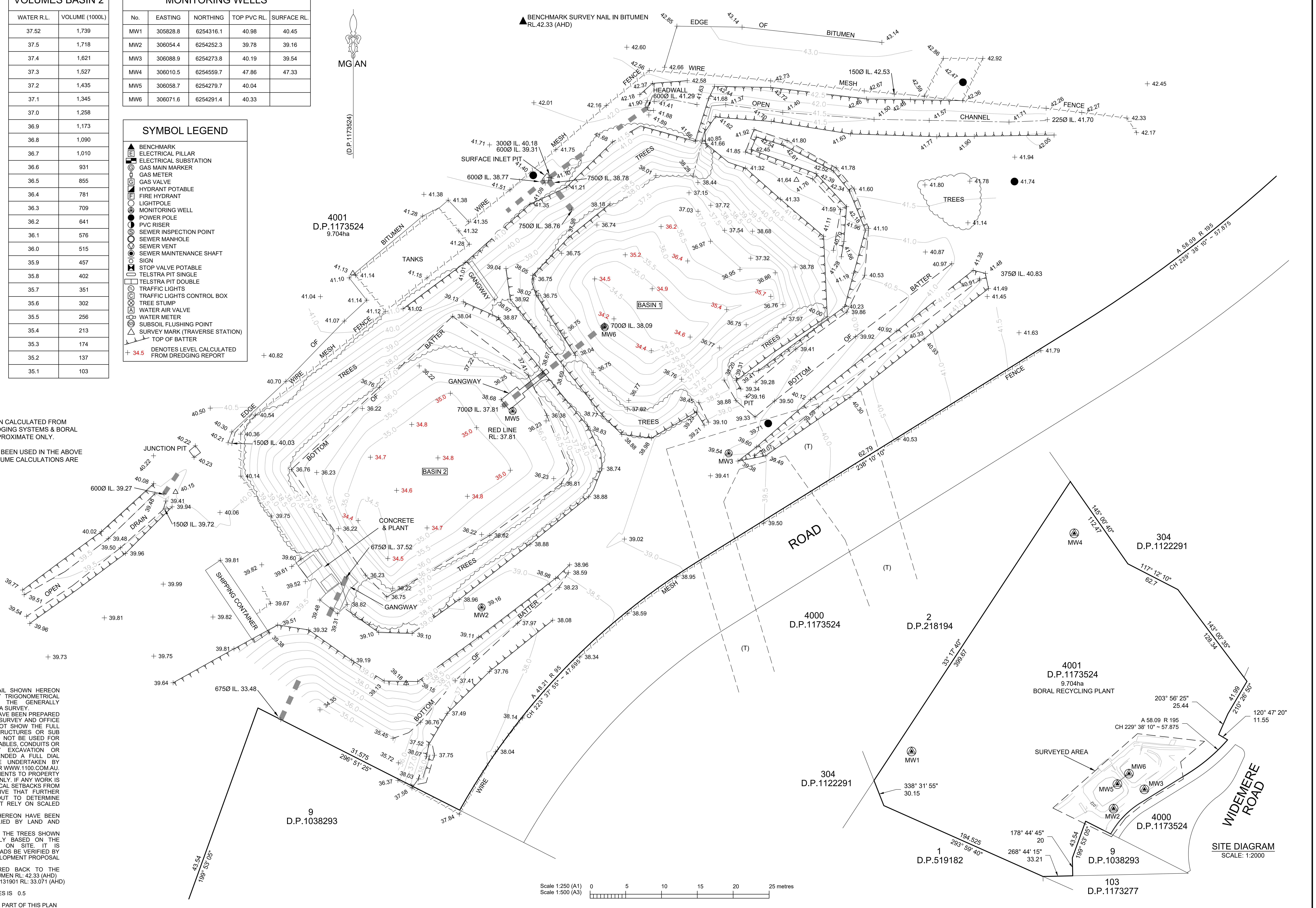
No.	EASTING	NORTHING	TOP PVC RL.	SURFACE RL.
MW1	305828.8	6254316.1	40.98	40.45
MW2	306054.4	6254252.3	39.78	39.16
MW3	306088.9	6254273.8	40.19	39.54
MW4	306010.5	6254559.7	47.86	47.33
MW5	306058.7	6254279.7	40.04	
MW6	306071.6	6254291.4	40.33	

SYMBOL LEGEND

▲	BENCHMARK
E	ELECTRICAL PILLAR
▚	ELECTRICAL SUBSTATION
Ⓖ	GAS MAIN MARKER
⌂	GAS METER
G	GAS VALVE
◩	HYDRANT POTABLE
F	FIRE HYDRANT
○	LIGHTPOLE
◬	MONITORING WELL
●	POWER POLE
◑	PVC RISER
Ⓢ	SEWER INSPECTION POINT
◎	SEWER MANHOLE
Ⓥ	SEWER VENT
◉	SEWER MAINTENANCE SHAFT
⍜	SIGN
⧗	STOP VALVE POTABLE
⬭	TELSTRA PIT SINGLE
◫	TELSTRA PIT DOUBLE
TL	TRAFFIC LIGHTS
C	TRAFFIC LIGHTS CONTROL BOX
⊗	TREE STUMP
A	WATER AIR VALVE
⊶	WATER METER
SS	SUBSOIL FLUSHING POINT
△	SURVEY MARK (TRAVERSE STATION)
⋏	TOP OF BATTER
+ 34.5	DENOTES LEVEL CALCULATED FROM DREDGING REPORT

LEVELS SHOWN IN RED HAVE BEEN CALCULATED FROM INFORMATION PROVIDED BY DREDGING SYSTEMS & BORAL RECYCLING PTY LTD AND ARE APPROXIMATE ONLY.

THE LEVELS SHOWN IN RED HAVE BEEN USED IN THE ABOVE VOLUME CALCULATIONS. THE VOLUME CALCULATIONS ARE APPROXIMATE ONLY.



IMPORTANT NOTES

1 THE LEVELS AND SURVEY DETAIL SHOWN HEREON HAVE BEEN DETERMINED BY TRIGONOMETRICAL METHODS AND ARE WITHIN THE GENERALLY ACCEPTED ACCURACY FOR SUCH A SURVEY.

2 ANY UTILITIES SHOWN HEREON HAVE BEEN PREPARED FROM A COMBINATION OF FIELD SURVEY AND OFFICE CALCULATION. THE PLAN MAY NOT SHOW THE FULL EXTENT OF ABOVE GROUND STRUCTURES OR SUB SURFACE UTILITIES AND SHOULD NOT BE USED FOR LOCATING SUB SURFACE PIPES, CABLES, CONDUITS OR STRUCTURES. PRIOR TO ANY EXCAVATION OR CONSTRUCTION IT IS RECOMMENDED A FULL DIAL BEFORE YOU DIG SEARCH BE UNDERTAKEN BY CONTACTING DBYD ON PH. 1100 OR WWW.1100.COM.AU.

3 THE RELATIONSHIP OF IMPROVEMENTS TO PROPERTY BOUNDARIES IS DIAGRAMMATIC ONLY. IF ANY WORK IS PLANNED WHICH RELIES ON CRITICAL SETBACKS FROM ANY BOUNDARY IT IS IMPERATIVE THAT FURTHER SURVEY WORK BE CARRIED OUT TO DETERMINE PROPERTY BOUNDARIES. DO NOT RELY ON SCALED DIMENSIONS.

4 THE LOT DIMENSIONS SHOWN HEREON HAVE BEEN COMPILED FROM PLANS SUPPLIED BY LAND AND PROPERTY INFORMATION NSW.

5 THE SPREAD OF THE CROWN OF THE TREES SHOWN HEREON IS DIAGRAMMATIC ONLY BASED ON THE AVERAGE SPREAD OBSERVED ON SITE. IT IS RECOMMENDED THAT TREE SPREADS BE VERIFIED BY SITE INSPECTION SHOULD A DEVELOPMENT PROPOSAL BE AFFECTED BY TREES.

6 ALL LEVELS MUST BE REFERRED BACK TO THE BENCHMARK SURVEY NAIL IN BITUMEN RL: 42.33 (AHD) THE ORIGIN OF THIS LEVEL IS SSM131901 RL: 33.071 (AHD) LOCATED IN WIDEMERE ROAD

7 THE CONTOUR INTERVAL IN METRES IS 0.5

THE ABOVE NOTES ARE AN INTEGRAL PART OF THIS PLAN

No.	AMENDMENT DESCRIPTION	BY	DATE
A	FIRST ISSUE	BF	23.03.17

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(T) RIGHT OF WAY (D121716)

mepstead
& ASSOCIATES
REGISTERED SURVEYORS AND
DEVELOPMENT CONSULTANTS

Sydney
10/4 Central Avenue, Thornleigh N.S.W. 2120
Phone 02 9875 4500 **Fax** 02 9875 4833

Postal
PO BOX 208, Pennant Hills N.S.W. 1715

Internet
mepstead@mepstead.com.au
www.mepstead.com.au

Designed:
Scale: 1:250
Drawn: B.F.
Datum: A.H.D.
Checked: C.P.
Date: 23.03.2017
L.G.A: FAIRFIELD
A1

Principal: BORAL RECYCLING PTY. LTD.

Project:
PLAN OF DETAIL & LEVELS OVER PART OF
LOT 4001 IN D.P.1173524 KNOWN AS BORAL RECYCLING,
WIDEMERE ROAD, WETHERILL PARK

Drg. No. 5165-DET1_A
Sheet No. 1
of 1 sheets
Our Ref:
5165

Appendix B – Stockpile Material Specifications and Photos

Photo B1 – Product Stockpile

Photo B2 – Washout Stockpile

Photo B3 – Washout Stockpile

Photo B4 – Stockpile Dust Suppression

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Ref: 2017 188213-188217 Rec. DGB20 SP 302 (0-4kt) Widemere as DGB Base RTA QA Spec. 3051.1
Page 1 of 4
Report Template Rev 1 December 2012 Authorised by A. Mendoza

Boral Construction Materials
Materials Technical Services

Unit 4, 3-5 Gibbon Road
Baulkham Hills NSW 2153 Australia
PO Box 400, Winston Hills NSW 2153

T: +61 (02) 9624 9900
F: +61 (02) 9624 9999

www.boral.com.au

TEST REPORT

CLIENT: BORAL RECYCLING PTY LTD (Widemere)
PROJECT: Quality Control Testing
MATERIAL: Recycled DGB20 S/P 302 (0 - 4000 tonnes)
as DGB20 Base

FILE No: 7/17
REQUEST No: 71542
DATE SAMPLED: 16.2.17
DATE TESTED: 17.2.17 to 8.3.17

SPECIFICATION: Roads and Traffic Authority NSW QA Specification **3051** - Unbound and Modified Base and Sub-Base Materials for Surfaced Road Pavements (Edition 5, June 1998).
Table **3051.1** Unbound Material (Based on Particle Size Distribution).

Particle Size Distribution **Test Methods RMS T106 and T107**				**Results**				
				Client Sample No.				
A. S. Sieve	**RTA QA Spec. 3051.1**	**Nominated Grading**	**Grading Tolerance RTA QA Spec. 3051.1**	P255502	P255503	P255504	P255505	P255506
				Laboratory Sample No.				
				188213	188214	188215	188216	188217
	% Passing	**% Passing**	**% Variation**	**% Passing**				
26.5mm	**100 (2)**	100	-	100	100	100	100	100
19.0mm	**95-100 (2)**	98	-	99	98	98	98	98
13.2mm	**70-90 (2)**	86	± 8 (2)	85	85	86	87	86
9.5mm	-	-	-	71	71	72	74	72
6.7mm	**50-70 (2)**	62	± 5 (2)	62	62	62	64	62
4.75mm	-	-	-	52	52	52	54	53
2.36mm	**35-55**	39	± 4 (2)	38	39	38	39	39
425µm	-	18.0	± 3 (1)	17.0	18.0	18.0	19.5	18.5
75µm	-	6.5	± 2 (1)	6.0	6.5	6.5	7.0	6.5
13.5µm	-	3.5	-	3.5	3.5	3.0	4.0	3.5
Total defect points (as per Spec. RTA 3051-13.2. **Max. 5.0 per sample**).				0.0	0.0	0.0	0.0	0.0
Average defect points (as per Spec. RTA 3051-13.2. **Max. average of 3.0**).				0.0				
Note:	Numerical value in brackets refers to defect weighting values as per RTA Table 3051.1.							

C. J. Shaw

Approved Signatory

Date 8.3.17 Serial No. 154618

NATA
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TECHNICAL
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NATA Accredited Laboratory
Number: 547

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Materials Technical Services

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Baulkham Hills NSW 2153 Australia
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www.boral.com.au

TEST REPORT

CLIENT: BORAL RECYCLING PTY LTD (Widemere)
PROJECT: Quality Control Testing
MATERIAL: Unbound Base S/P 390 (0 - 4000 tonnes)
as DGS20

FILE No: 7/16
REQUEST No: 70879
DATE SAMPLED: 19.12.16
DATE TESTED: 21.12.16 to 12.1.17

SPECIFICATION: Roads and Traffic Authority NSW QA Specification **3051**. Unbound and Modified Base and Sub-Base Materials for Surfaced Road Pavements (Edition 5, June 1998).
Table 3051.2 Unbound and Modified Material (Based on Shear Strength).

Test Method AS1289.3.6.1				**Results**				
Determination of the particle size distribution of a soil (standard method of analysis by sieving).				**Client Sample No.**				
				P255450	P255451	P255452	P255453	P255454
				Laboratory Sample No.				
				186211	186212	186213	186214	186215
	RTA QA Spec. 3051.2	**Nominated Grading**	**Grading Tolerance RTA QA Spec. 3051.2**					
A. S. Sieve	**% Passing**	**% Passing**	**% Variation**	**% Passing**				
26.5mm	**100**	100	**± 10**	100	100	100	100	100
19.0mm	-	97	**± 10**	97	97	98	97	98
13.2mm	-	86	**± 8(2)**	85	87	87	86	87
9.5mm	-	75	-	72	76	77	76	76
6.7mm	**50-80**	64	**± 5(2)**	61	65	66	65	65
4.75mm	-	55	-	52	55	56	56	56
2.36mm	-	42	**± 4(2)**	40	43	43	43	43
425µm	-	22	**± 3(1)**	21	22	22	23	22
75µm	-	8	**± 2(1)**	8	8	8	8	8
13.5µm	-	-	-	-	-	-	-	-
Total defect points (as per Spec. RTA 3051.2 **Max. 5.0 per sample**).				0.0	0.0	0.0	0.0	0.0
Average defect points (as per Spec. RTA 3051.2 **Max. average of 3.0**).				0.0				
Notes :	1. Numerical value in brackets refers to defect weighting values as per RTA Table 3051.2.							
	2. Dry sieving done on materials retained on 2.36mm sieve as per item 5.5.3 of the Standard.							

Approved Signatory

C. J. Shaw

Date 8-3-/7 Serial No. 154628

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Number: 547

Appendix C – Water Balance Calibration Rainfall Summary

	Prospect Dam	Greystanes	Horsley Park			Adopted for Calibration
	BoM (67019)	BoM (67017)	BoM (67119)			
Distance from Site	1.5km to the North	3.2 km to the North-East	5.3km to the South West)			
Elevation	**61m AHD**	**70m AHD**	**100 m AHD**	**Min**	**Max**	
17/02/2017	0	0	0	0	0	0
18/02/2017	8.1	9.4	12.6	8.1	12.6	8.1
19/02/2017	2	3.4	3.6	2	3.6	2
20/02/2017	0	0	0	0	0	0
21/02/2017	0	0	0	0	0	0
22/02/2017	0	0	0	0	0	0
23/02/2017	0	0	0	0	0	0
24/02/2017	0	0	0	0	0	0
25/02/2017	0.9	1.4	2	0.9	2	0.9
26/02/2017	69.4	42	49	42	69.4	**60**
27/02/2017	8	11.8	11.8	8	11.8	8
28/02/2017	8.2	2.4	3	2.4	8.2	8.2
1/03/2017	9	12.2	19.4	9	19.4	9
2/03/2017	14	22	14.2	14	22	14
3/03/2017	34.2	13.6	7.4	7.4	34.2	**50**
4/03/2017	63	27.6	19.6	19.6	63	**20**
5/03/2017	5.4	6.8	3.2	3.2	6.8	5.4
6/03/2017	3.2	3	3.4	3	3.4	3.2
7/03/2017	1.3	1.6	0.6	0.6	1.6	1.3
8/03/2017	0.8	1.8	1.4	0.8	1.8	0.8
9/03/2017	4.8	4	1.8	1.8	4.8	4.8
10/03/2017	0	0	0	0	0	0
11/03/2017	0	0	0	0	0	0
12/03/2017	0	0	0	0	0	0
13/03/2017	0	0	0	0	0	0
14/03/2017	3.8	2.6	1.2	1.2	3.8	3.8
15/03/2017	70.6	62	62.8	62	70.6	**46**
16/03/2017	11.3	10	9.8	9.8	11.3	11.3
17/03/2017	16.4	12	15.4	12	16.4	16.4
18/03/2017	30	32.2	24.4	24.4	32.2	30
19/03/2017	12.6	12.8	12	12	12.8	12.6
20/03/2017	0.8	1.6	1.6	0.8	1.6	0.8
21/03/2017	0	0	0.2	0	0.2	0
22/03/2017	12.2	12.8	8.6	8.6	12.8	12.2
23/03/2017	6.6	22.2	6.4	6.4	22.2	6.6
24/03/2017	5.2	8.2	6.4	5.2	8.2	5.2
25/03/2017	0.1	0	0.6	0	0.6	0.1
26/03/2017	0	0	0	0	0	0
27/03/2017	0	0	0	0	0	0
28/03/2017	0	0	0	0	0	0
29/03/2017	0	0	0	0	0	0
30/03/2017	0	0	0	0	0	0
31/03/2017	29	31	33.6	29	33.6	29
1/04/2017	0	0	0	0	0	0
Total	**431**	**370**	**336**	**294**	**491**	**370**

Red Text denotes an adjustment to the recorded daily rainfall at BoM 67019

Appendix F

Incident management chart

Appendix 3-02 Incident Reporting, Investigation and Action Management

Appendix 2. Incident Management Chart

For detailed requirements see the **GRP-HSEQ-3-02 Incident Reporting, Investigation and Action Management Standard**.

Consequence definitions are an an extract from HSEQ-1-03-A-02 Risk Matrix

INCIDENT CLASSIFICATION **Actual or Potential (Worst Credible) Consequence**	**5. Severe**	**4. Major**	**3. Moderate**	**2. Minor**	**1. Incidental**
Health	* Severe illness or chronic exposure resulting in fatality or significant life shortening effects.	* Illness or chronic exposure resulting in significant life-impacting effects.	Illness or significant adverse health effect needing a high level of medical treatment or management.	Mild illness or health effect and/or some functional impairment that needs some treatment but is usually easily managed, medically.	Illness or effect with limited or no impact on ability to function – no treatment necessary.
Safety	* Fatality or life threatening injuries, or resulting in substantial life changing permanent disability e.g. blindness, loss of hand(s), limbs or use of limbs.	* Serious injuries, requiring immediate emergency hospital treatment as an inpatient, resulting in significant permanent disabling injury e.g. reduced mobility, loss of fingers or extended temporary impairment and/or extended hospitalisation. Serious/dangerous incident/occurrence (as per regulatory reporting definition).	One or more injuries that are serious enough to result in lost time, non-permanent disabling injuries or an injury that may require non-emergency hospitalisation as an inpatient.	Injuries requiring competent first aid, treatment by a medical professional or as a hospital outpatient and typically no time lost (i.e. FAIs and most MTIs).	Injury that does not require any treatment.
Environment	Destruction of important populations of habitat, species, or natural environment.	Extensive and measurable medium-term impact on habitat, species, or natural environment.	Localised and measurable medium-term impact on habitat, species or natural environment	Localised and measurable short-term impact on habitat, species or natural environment.	No discernible impact on or measurable impairment of habitat, species or natural environment (air, water, land).
Property Damage	Severe damage to infrastructure – multiple items of plant or equipment requiring replacement or requiring shutdown and overhaul of a major site. Significant business interruption and recovery costs.	Major damage to infrastructure, and/or equipment inoperable or made unsafe for use requiring replacement or major repair/overhaul. Shut-down of smaller site may be necessary, or HV/HME written off. Material business interruption and recovery costs.	Moderate damage requiring repairs before full use (to pre-damage levels) is possible. LV written off. Some business interruption.	Minor damage which does not impede immediate and short term use, but requires repair for sustainable ongoing use.	Very minor damage akin to 'fair wear and tear' - not requiring rectification for ongoing use.
Regulatory	Significant prosecution action, including risk to Company officers	Formal, higher level intervention (e.g. prohibition notice) at a site and risk of further interventions at other sites. Material risk of regulatory investigation or prosecution.	Formal intervention e.g. issuing an Improvement Notice at a site but unlikely to escalate if complied with.	Risk of penalising action unlikely and any intervention is limited to a field report (or similar).	No risk of penalising actions and any intervention is limited to a nonbinding observation.
Community/Reputation	Widespread community unrest and/or adverse national/international media coverage.	Community alarm at a regional level and adverse and longer running local/regional media coverage.	Coordinated community concern at a local level and limited local media coverage.	A clustering of complaints and risk of local media interest.	Isolated complaint from a local individual.
Quality	Incident that may result in significant erosion of sharemarket value or loss of reputation.	Incident that results in a potential or actual claim (or rework) in excess of AUD100K and that generally requires external engineering or legal support.	Incident that results in a potential or actual claim (or rework) of up to AUD100K and can be resolved internally (i.e. without external expert support).	A customer complaint or incident resulting in a potential or actual claim (or rework) under AUD5K (e.g. credit note or product reject)	Minor incident with no resulting impact on the customer.

INCIDENT NOTIFICATION **✓ Immediate phone call / email of SIMS Report within 24 hours**		**5. Severe**		**4. Major**		**3. Moderate**		**2. Minor**	
Notify incident to:	Responsibility:	Actual	Potential	Actual	Potential	Actual	Potential	Actual	Potential
Injury Management Advisor (for all injuries)	Supervisor	✓		✓		✓		✓	
Responsible Manager (Site / Operations / Business Unit)	Supervisor or Worker	✓	✓	✓	✓	✓	✓	✓	
HSE/Q Regional Manager	Responsible Site-Ops-BU Mgr	✓	✓	✓	✓	✓			
Regional Sales Manager (for customer related incidents only)	Responsible Site-Ops-BU Mgr	✓	email only	✓	email only	✓			
Business General or Executive General Manager	Responsible Site-Ops-BU Mgr	✓	email only	✓	email only	✓			
Divisional Managing Director / CEO / President	Business GM or EGM	✓							
Group Managing Director / CEO	DMD or EGM	✓							
Group HSE Director and Divisional GM HSE and National Q Mgr.	HSE/Q Regional Manager	✓	email only	✓	email only	✓			
Group Legal	HSE/Q Regional Manager	✓	email only	✓	email only				
Group Communications & PR	HSE/Q Regional Manager	✓	email only	✓	email only				
Boral Property Group	HSE/Q Regional Manager	BPG to be advised of all interactions with Env. Regulators including visits, correspondence, PINs, etc							
External – Emergency Services (Police, Ambulance, Fire Services)	Site Personnel	As required							
External – Regulatory Authorities (e.g. WHS/DPI/ENV/EPA)	HSE Regional Manager	As required (after consulting with business)							

Report Only

INCIDENT REPORTING	**5. Severe**	**4. Major**	**3. Moderate**	**2. Minor**	**1. Incidental**
HSE Incidents (including Regulator activity / correspondence received)	All HSE related incidents must be recorded into SIMS or similar database by end of shift				
Quality Incidents	All quality related incidents must be recorded into QIRS or similar database.				

INCIDENT INVESTIGATION	**5. Severe**	**4. Major**	**3. Moderate**	**2. Minor**	**1. Incidental**
Investigation Type	ICAM – HSE 8D - Q	5 Whys/Short Form* (ICAM as directed by HSE) (8D as directed by Q)	5 Whys /Short Form Investigation*		SIMS (or equiv.) entry
Investigation Team Leadership	HSE/Q	Business (GM)	Business (Local)		
Investigation Team Membership	Internal or external specialists as required		Local resources		
Investigation Completion Timeframe	Within 45 days	Within 30 days	Within 14 days		Within 7 days
Sign-off	DMD	EGM/GM	GM or Ops Manager	Line Manager	Team Leader/Manager

* Investigations (other than ICAM) can be entered into SIMS without the need to develop a separate Investigation Report

HSEQ ALERTS AND SHARING LEARNINGS	**5. Severe**	**4. Major**	**3. Moderate**	**2. Minor**	**1. Incidental**
HSEQ Alert (initial incident detail and immediate actions)	HSEQ Alert within 48 Hrs	HSEQ Alert within 48 hrs	HSQE Alert as directed for trends		
HSEQ Learning (Release with Investigation Report with actions for business	HSEQ Learning	HSEQ Learning (as directed by HSE/Q)	Nil		

CORRECTIVE/PREVENTIVE ACTIONS	**5. Severe**	**4. Major**	**3. Moderate**	**2. Minor**	**1. Incidental**
Implementation, Monitoring and Close-Out	All Site / Operations Managers to implement actions arising from HSE Alerts and HSEQ Learnings, monitor progress and close out within reasonable timeframes.				

MEDIA COMMUNICATIONS	Follow the requirements of the **GRP-HSEQ-2-02 Communication and Consultation** Standard

Appendix G

Environment protection licence

Section 55 Protection of the Environment Operations Act 1997

Environment Protection Licence

Licence - 11815

Licence Details

Number:	11815
Anniversary Date:	26-November

Licensee

BORAL RECYCLING PTY LIMITED

PO BOX 6041
NORTH RYDE NSW 2113

Premises

WIDEMERE RECYCLING
38 WIDEMERE ROAD
WETHERILL PARK NSW 2164

Scheduled Activity

Resource recovery

Waste storage

Fee Based Activity	Scale
Recovery of general waste	Any general waste recovered
Waste storage - other types of waste	Any other types of waste stored

Region

Sydney Waste Compliance
59-61 Goulburn Street
SYDNEY NSW 2000
Phone: (02) 9995 5000
Fax: (02) 9995 5999

PO Box A290
SYDNEY SOUTH NSW 1232

Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 (“the Act”) and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

The EPA publication “A Guide to Licensing” contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

BORAL RECYCLING PTY LIMITED

PO BOX 6041

NORTH RYDE NSW 2113

subject to the conditions which follow.

1 Administrative Conditions

A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity	Fee Based Activity	Scale
Resource recovery	Recovery of general waste	Any general waste recovered
Waste storage	Waste storage - other types of waste	Any other types of waste stored

A2 Premises or plant to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
WIDEMERE RECYCLING
38 WIDEMERE ROAD
WETHERILL PARK
NSW 2164
LOT 4001 DP 1173524

A2.2 The premises location is shown on the map below.

A3 Information supplied to the EPA

A3.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:

a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and

b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

2 Discharges to Air and Water and Applications to Land

P1 Location of monitoring/discharge points and areas

P1.1 The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.

Air

EPA identi-fication no.	Type of Monitoring Point	Type of Discharge Point	Location Description
1	Ambient air monitoring		Dust gauge labelled "Ambient Air Monitoring" on map titled "Boral Recycling Plant EPL 11815 Licensed Monitoring Points" dated 11 June 2010

P1.2 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

Water and land

EPA Identi-fication no.	Type of Monitoring Point	Type of Discharge Point	Location Description
2	Discharge to Waters Discharge Quality Monitoring Volume Monitoring	Discharge to Waters Discharge Quality Monitoring Volume Monitoring	Discharge outlet labelled "Stormwater Discharge Point" on map titled "Boral Recycling Plant EPL 11815 Licensed Monitoring Points" dated 11 June 2010

P1.3 The following points referred to in the table below are identified in this licence for the purposes of weather and/or noise monitoring and/or setting limits for the emission of noise from the premises.

Noise/Weather

EPA identi-fication no.	Type of monitoring point	Location description
3	Noise monitoring	Munro Street Greystanes
4	Noise monitoring	Southern Greystanes Estate Residential Lands
5	Noise monitoring	Daruga Avenue, Nelsons Ridge

3 Limit Conditions

L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L1.2 Discharge of waters from Point 2 is permitted when the discharge occurs solely as a result of rainfall at the premises exceeding a total of 45 millimetres over any consecutive five day period (subject to Condition U1).

Note: A controlled point source discharge is a discharge where the:

- discharge point location can be specifically identified and clearly defined;
- licensee has control over the frequency, volume and pollutant concentrations of the discharge; and
- EPA can reasonably expect that with proper and efficient management practices the licensee can comply with volume and pollutant concentration limits at all times.

L2 Concentration limits

L2.1 For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.

L2.2 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.

L2.3 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\s.

L2.4 Water and/or Land Concentration Limits

POINT 2

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
Oil and Grease	milligrams per litre				10
pH	pH				6.5-8.5

Total suspended solids	milligrams per litre	50
Turbidity	nephelometric turbidity units	150

L3 Volume and mass limits

L3.1 For each discharge point or utilisation area specified below (by a point number), the volume/mass of:
a) liquids discharged to water; or;
b) solids or liquids applied to the area;
must not exceed the volume/mass limit specified for that discharge point or area.

Point	Unit of Measure	Volume/Mass Limit
2	kilolitres per day	100

L4 Waste

L4.1 The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled "Waste" and meeting the definition, if any, in the column titled "Description" in the table below.
Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled "Activity" in the table below.
Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled "Other Limits" in the table below.
This condition does not limit any other conditions in this licence.

Code	Waste	Description	Activity	Other Limits
NA	Building and demolition waste	As defined in Boral engineered glass sand resource recovery exemption 2020	Resource recovery Waste storage	
NA	Building and demolition waste	As defined in Boral engineered glass sand resource recovery order 2020	Resource recovery Waste storage	
NA	Waste concrete slurry from the company's concrete batching plants	Wet concrete batching plant stirrer waste	Resource recovery Waste storage	NA
NA	Concrete, bricks and roof tiles	Tiles and masonry, including seconds materials direct from	Resource recovery Waste storage	NA

		manufacturer		
NA	Excavated natural material		Resource recovery Waste storage	NA
NA	Building and demolition waste	As defined in Schedule 1 of the POEO Act, in force from time to time.	Resource recovery Waste storage	NA
NA	Asphalt waste (including asphalt resulting from road construction and waterproofing works)		Resource recovery Waste storage	NA
NA	Virgin excavated natural material	As defined in Schedule 1 of the POEO Act, in force from time to time.	Resource recovery Waste storage	NA
NA	Plasterboard and ceramics		Resource recovery Waste storage	NA
NA	Cured concrete waste from a batch plant		Resource recovery Waste storage	NA
NA	Soils		Resource recovery Waste storage	Arsenic 40mg/kg; Cadmium 2mg/kg; Copper 200mg/kg; Mercury 1.5mg/kg; Zinc 600mg/kg; Petroleum Hydrocarbons C6-C9 150mg/kg; Petroleum Hydrocarbons C10-C36 1600mg/kg; Polycyclic aromatic hydrocarbons 80mg/kg; Polychlorinated biphenyls (individual) 1mg/kg. No Acid Sulfate Soil or Potential Acid Sulfate Soil is to be received at the Premises. Soil thresholds will be subject to review from time to time.
NA	Garden waste	As defined in Schedule 1 of the POEO Act, in force from time to time.	Resource recovery Waste storage	Not more than 1,000 tonnes stockpiled onsite at any one time.

L4.2 The authorised amount of waste permitted on the premises cannot exceed 750,000 tonnes at any one time, unless approved in writting by the EPA.

L4.3 The Licensee must not receive on the Premises, more than 1,000,000 tonnes of waste per year.

L4.4 The height of any stockpile of any material on the Premises, must not exceed twenty (20) metres above ground level.

L4.5 No asbestos waste is to be accepted or stored at the premises.

L4.6 The licensee must have in place and implement procedures to identify and prevent the acceptance of any waste not permitted by condition L4.1 at the premises.

L5 Noise limits

L5.1 Noise generated at the premises that is measured at each noise monitoring point established under this licence must not exceed the noise levels specified in Column 4 of the table below for that point during the corresponding time periods specified in Column 1 when measured using the corresponding measurement parameters listed in Column 2.

POINT 3

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Day	Day-LAeq (15 minute)	n/a	39
Evening	Evening-LAeq (15 minute)	n/a	38
Morning-Shoulder	Morning Shoulder-LAeq(15 minute) (6am-7am Mon. -Sat. & 6am-8am Sun & Public Holidays)	n/a	39

POINT 3,4,5

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Night	Night-LAeq (15 minute)	n/a	35
Night	LAFmax	n/a	50

POINT 4

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Day	Day-LAeq (15 minute)	n/a	39
Evening	Evening-LAeq (15 minute)	n/a	37

Morning-Shoulder	Morning Shoulder-LAeq(15 minute) (6am-7am Mon. -Sat. & 6am-8am Sun & Public Holidays)	n/a	39

POINT 5

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Day	Day-LAeq (15 minute)	n/a	35
Evening	Evening-LAeq (15 minute)	n/a	35
Morning-Shoulder	Morning Shoulder-LAeq(15 minute) (6am-7am Mon. -Sat. & 6am-8am Sun & Public Holidays)	n/a	35

L5.2 For the purposes of Condition 5.1:
a) Day is defined as the period from 7am to 6pm;
b) Evening is defined as the period from 6pm to 10pm;
c) Night is defined as the period from 10pm to 12am; and
d) Morning shoulder period is a subset of the night period between 6am to 7am.

L5.3 The noise limits set out in condition L5.1 apply under all meteorological conditions except for the following:
a) Wind speeds greater than 3 metres/second at 10 metres above ground level.
b) Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
c) Stability category G temperature inversion conditions.

L5.4 For the purposes of condition L5.4:
a) Data recorded by a meteorological station installed on site must be used to determine meteorological conditions; and
b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in *Part E4 of Appendix E to the NSW Industrial Noise Policy*.

L5.5 To determine compliance:

a) with the Leq(15 minute) noise limits in condition L5.1, the noise measurement equipment must be located:

- approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
- within 30 metres of a dwelling façade, but not closer than 3m, where any dwelling on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
- within approximately 50 metres of the boundary of a National Park or a Nature Reserve.

b) with the LA1(1 minute) noise limits in condition L5.1, the noise measurement equipment must be located within 1 metre of a dwelling façade.

c) with the noise limits in condition L5.1, the noise measurement equipment must be located:

- at the most affected point at a location where there is no dwelling at the location; or
- at the most affected point within an area at a location prescribed by conditions L5.5(a) or L5.5(b).

L5.6 A non-compliance of condition L5.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:

- at a location other than an area prescribed by conditions L5.5(a) and L5.5(b); and/or
- at a point other than the most affected point at a location.

L5.7 For the purposes of determining the noise generated at the premises the *NSW Noise Policy for Industry (2017)* must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

L5.8 The licensee must ensure that all activities are to be undertaken in a manner that will minimise noise and vibration impacts on sensitive receivers.

L6 Hours of operation

L6.1 All construction work at the premises must only be conducted between 7am and 6pm Monday to Friday inclusive, and between 8:00am and 1:00pm on Saturdays. No construction activity is permitted on a Sunday or a Public Holiday.

L6.2 Subject to compliance with noise limits in Condition 5.1, operational activities associated with Premises shall only be carried out between the following hours:
a) 6:00am and midnight, Monday to Saturday inclusive;
b) 6:00am and 6:00pm on one Sunday per month; and
c) at no time on public holidays.

L6.3 Notwithstanding Condition 6.2, but subject to compliance with the noise limits in Condition 5.1, ancillary activities on the Premises may be carried out between the following hours:
a) 6:00am to midnight Monday to Saturday, inclusive;
b) 6:00am and 6:00pm on Sundays; and
c) at no time on public holidays.

Note: Ancillary Activities means any servicing and/or maintenance of the equipment/machinery associated with the operations, loading and unloading of material onto/from vehicles and stockpiles and the selling of recycled product.

L6.4 The Licensee must keep a record of all works undertaken on a Sunday.

L7 Potentially offensive odour

L7.1 No condition of this licence identifies a potentially offensive odour for the purpose of Section 129 of the Protection of the Environment Operations Act 1997.

Note: Section 129 of the Protection of the Environment Operations Act 1997, provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environment protection licence as a potenitally offensive odour and the odour was emitted in accordance with conditions of licence directed at minimising odour.

L7.2 Any odour generating material is to be removed from the premises within 24 hours of being received.

4 Operating Conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.
This includes:
a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
a) must be maintained in a proper and efficient condition; and
b) must be operated in a proper and efficient manner.

O3 Dust

O3.1 All activities conducted on the premises must be undertaken by such practical means to avoid or minimise the generation and emission of air pollutants, including dust.

O3.2 The premises must be maintained in a condition which prevents or minimises the emission of air pollutants, including dust, from the premises.

O3.3 The licensee must ensure that no material, including sediment or oil, is tracked from the premises.

O3.4 Trucks entering and leaving the premises that are carrying loads must be covered at all times except during loading and unloading.

O3.5 Vehicle routes in use on the premises are to be frequently wetted to prevent or minimise dust during hours of operation.

O3.6 Dust sprays and/or dust suppression systems must be installed and operated on crushing, grinding and screening equipment associated with dust generation at the premises during hours of operation.

O3.7 Entries, exits and car parks must be maintained in a good condition with a sealed hardstand road.

O3.8 All entry/exits to the premises must be maintained throughout the day to prevent any sediment tracking from the premises.

O3.9 An appropriate wheel wash facility must be installed, maintained and operated during the operational hours on each exit of the premises. Wheel wash infrastructure must always be maintained in a fully operational manner.

O3.10 The licensee must immediately cease dust generating activities under dry, windy conditions to prevent dust leaving the premises.

O4 Effluent application to land

O4.1 Waste water must only be applied to the area within the boundary of the premises.

O4.2 Spray from wastewater application must not drift beyond the boundary of the wastewater utilisation area which it is applied.

O5 Emergency response

O5.1 The licensee must prepare, maintain and implement as necessary, a current Pollution Incident Response Management Plan (PIRMP) for the premises.
NOTE: The licensee must develop their PIRMP in accordance with the requirements in Part 5.7A of the Protection of the Environment Operations Act 1997 (the POEO Act) and the POEO Regulations.

O6 Processes and management

O6.1 Each type of waste stored on site for recovery/recycling must be stockpiled separately.

O6.2 The licensee must install and maintain permanent stockpile height markers that show the height of twenty (20) metres above ground level, so that a visual check can be made against the markers to determine the height of any stockpile.

O6.3 The licensee must take all practical steps to control entry to the premises.

O7 Waste management

O7.1 The Licensee must install, maintain and operate at all times a calibrated weighbridge to record the volume of all waste brought into the premises.

O7.2 The licensee must ensure that all waste stored or processed at the premises is assessed and classified in accordance with the EPA Waste Classification Guidelines and any applicable Resource Recovery Orders and Exemptions as in force from at the time.

O7.3 Appropriate measures must be put in place to ensure that all vehicular traffic associated with any operations at the premises must pass through the wheel wash when leaving the premises, except, in circumstances where the vehicle exiting the premises is: - a motor car (being a motor vehicle constructed primarily for the carriage of persons or that is of the kind known as a utility, station wagon or panel van) or motor car trailer; and - not transporting waste to or from the premises.

O8 Other operating conditions

O8.1 The licensee maintain surface water detention basins with a minimum capacity to contain 45 millimetres of rainfall over any consecutive 5 day period.

O8.2 The licensee must ensure that a visible marker is installed in each sediment retention basin in a position that shows the freeboard in the basin that equates to the volume required to contain all rainfall and runoff in the catchment from a 45 millimetre rainfall event over any consecutive 5 day period.

O8.3 All catchment/sediment, waste and stormwater dams/storage must be designed, maintained and operated with adequate capacity to store surface water collected on site as per the specifications outlined in Managing Urban Stormwater: Soils and construction - Volume 1.

O8.4 The Licensee must not allow the tracking of mud by vehicles leaving the premises.

O8.5 All erosion and sediment controls must be installed and maintained on the premises. The controls must be inspected regularly and after each rain event and repaired if required.

O8.6 Sediment and erosion control devices, including sediment fences, must be maintained at the premises in a manner that prevents stormwater discharge points from being impacted by sediment discharge.

O8.7 The Licensee must ensure that all surface water runoff is collected on site and drains to a storage pond/dam.

5 Monitoring and Recording Conditions

M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:
a) in a legible form, or in a form that can readily be reduced to a legible form;
b) kept for at least 4 years after the monitoring or event to which they relate took place; and
c) produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
a) the date(s) on which the sample was taken;
b) the time(s) at which the sample was collected;
c) the point at which the sample was taken; and
d) the name of the person who collected the sample.

M2 Requirement to monitor concentration of pollutants discharged

M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

M2.2 Air Monitoring Requirements

POINT 1

Pollutant	Units of measure	Frequency	Sampling Method
Particulates - Deposited Matter	grams per square metre per month	Continuous	AM-19

M2.3 Water and/ or Land Monitoring Requirements

POINT 2

Pollutant	Units of measure	Frequency	Sampling Method
Oil and Grease	milligrams per litre	Daily during any discharge	Grab sample
pH	pH	Daily during any discharge	Grab sample
Total suspended solids	milligrams per litre	Daily during any discharge	Grab sample
Turbidity	nephelometric turbidity units	Daily during any discharge	Grab sample

M3 Testing methods - concentration limits

M3.1 Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:
a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or
b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or
c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.

M3.2 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

Note: The *Protection of the Environment Operations (Clean Air) Regulation 2010* requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".

M4 Recording of pollution complaints

M4.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M4.2 The record must include details of the following:
a) the date and time of the complaint;
b) the method by which the complaint was made;

c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
d) the nature of the complaint;
e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
f) if no action was taken by the licensee, the reasons why no action was taken.

M4.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M4.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M5 Telephone complaints line

M5.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M5.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

M5.3 The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.

M6 Requirement to monitor volume or mass

M6.1 For each discharge point or utilisation area specified below, the licensee must monitor:
a) the volume of liquids discharged to water or applied to the area;
b) the mass of solids applied to the area;
c) the mass of pollutants emitted to the air;
at the frequency and using the method and units of measure, specified below.

POINT 2

Frequency	Unit of Measure	Sampling Method
Continuous during discharge	kilolitres per day	By Calculation (volume flow rate or pump capacity multiplied by operating time)

M7 Other monitoring and recording conditions

M7.1 The licensee must keep a record of each load of Soil, as referred to under Condition L4.1, that is received at the premises. The record must include, but not necessarily be limited to, the following:
a) a copy of the waste classification report in accordance with the Waste Classification Guidelines, including the classification and the limits specified in the L4.1 table;
b) the quantity (in tonnes) of the Soil received;
c) the date and time that the Soil were received;
d) the registration number of the vehicle transporting the Soil to the premises;

e) the source(s) and address where the Soil was received from; and
f) the name and contact details of the company or individual delivering the Soil to the premises.
The record must be retained at the premises for at least 4 years after the receipt of the load of the soil.
The record must be produced to any authorised officer of the EPA upon request.

6 Reporting Conditions

R1 Annual return documents

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:

1. a Statement of Compliance,
2. a Monitoring and Complaints Summary,
3. a Statement of Compliance - Licence Conditions,
4. a Statement of Compliance - Load based Fee,
5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan,
6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and
7. a Statement of Compliance - Environmental Management Systems and Practices.

At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

R1.3 Where this licence is transferred from the licensee to a new licensee:
a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:
a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

R1.5 The Annual Return for the reporting period must be supplied to the EPA via eConnect *EPA* or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

R1.7 Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:

a) the licence holder; or
b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R2 Notification of environmental harm

R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
a) where this licence applies to premises, an event has occurred at the premises; or
b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,
and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:
a) the cause, time and duration of the event;
b) the type, volume and concentration of every pollutant discharged as a result of the event;
c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

7 General Conditions

G1 Copy of licence kept at the premises or plant

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

8 Pollution Studies and Reduction Programs

U1 Water Pollution Management

Cessation of Discharge

U1.1 No discharge of water is permitted from the Premises until water quality levels stabilise and monitoring results are provided to the EPA. Any excess water captured on the Premises must be disposed of at a facility that can lawfully receive that type of waste. Recommencement of discharge from the Premises must be approved in writing by the EPA.

Surface Water Discharge Characterisation Assessment

U1.2 The Licensee must engage a suitably qualified and experienced person to prepare a Surface Water Discharge Characterisation Assessment.

U1.3 The Surface Water Discharge Characterisation Assessment, must be submitted to the EPA by Friday 31 March 2017.

U1.4 The Surface Water Discharge Characterisation Assessment must include, at a minimum:

a.) identification of all the potential pollutants of concern which may be present in a discharge from the Premises. This list is to be developed in consultation with the EPA;

b.) water sampling and reference to all relevant existing data for all identified potential pollutants of concern in the sediment basin or site discharges, including but not limited to:
  i.) a full suite of current analytes from the Surface Water Monitoring and Mitigation Plan;
  ii.) a full suite of metals, including aluminium, boron, silver and tin;
  iii.) any other potential pollutants such as current or proposed treatment chemical residuals.

c.) sufficient sampling to capture the full variability of water quality at the Premises, including average or typical through to worst case scenarios, guided by protocols to ensure that sampling events are triggered by the full range of operational processes that would materially impact water quality, and be linked to ongoing implementation of mitigation measures, e.g. representative data before and after dredging of sediment basins. As a minimum the Licensee must:

  i.) undertake 5 independent sampling events within the sediment basin (post dredging); and
  ii.) collect samples that coincide with significant runoff events before 31 March 2017.

d.) an assessment of the potential impact of discharges on receiving waters, based on the surface water characterisation and with reference to ANZECC (2000) assessment criteria for slightly-to moderately disturbed ecosystems and the NSW Water Quality Objectives for Prospect Creek (note that the ANZECC (2000) toxicant decision tree can be used to refine the default trigger values (See Section 3.4.3.2 *“Decision tree for applying the guideline trigger values”*)).

e.) Specify the analytical limits of reporting used for any existing and new data that is being assessed and:

  i.) compare that limit of reporting to the relevant ANZECC (2000) assessment criteria for slightly-to moderately disturbed ecosystems;
  ii.) where the limit of reporting does not provide a suitable basis for assessing risk of water pollution, propose alternative options to characterise the risk, including more sensitive laboratory testing or risk mitigation options.

The level of reporting for concentrations of pollutants should be sensitive enough to detect pollutants at levels related to their environmental risk and ANZECC (2000) toxicant trigger value (where available) while having regard to the best available analytical practical quantification limits using available technology.

Sampling and analysis for the characterisation must be in accordance with the *Approved Methods for the Sampling and Analysis of Water Pollutants in NSW* (2004).

Surface Water Mitigation and Monitoring Plan

U1.5 The Licensee must engage a suitably qualified and experienced person to prepare a Surface Water Mitigation and Monitoring Plan.

U1.6 The Surface Water Mitigation and Monitoring Plan, must be submitted to the EPA by Friday 28 April 2017.

U1.7 The Surface Water Mitigation and Monitoring Plan must include, as a minimum, the following components:

a.) an investigation of practical measures that could be taken to avoid or minimise pollution based on the Surface Water Discharge Characterisation Assessment at U1.4. Consideration should include but not be limited to at-source controls on site, reducing wastewater run-off volumes, treatment options and associated wastewater storage requirements.

b.) justification for rejecting options assessed at U1.7a.

c.) development of a program of preferred mitigation measures with proposed timeframes for implementation;

d.) in the context of the proposed mitigation measures at U1.7c, a review of the water balance must be undertaken to determine appropriate detention and discharge volumes for managed overflows based on the level of water pollution risk. This review must take into account that the current managed overflow regime is based on uncontaminated discharge quality and is therefore inappropriate;

e.) establish an ongoing runoff and discharge monitoring program to validate outcomes of the proposed mitigation measures. The program must include at a minimum:

- i.) identification of pollutants to be monitored based on the Surface Water Discharge Characterisation Assessment and mitigation measures proposed in U1.7c above;
- ii.) identification of appropriate trigger values for pollutants and proposed actions and mitigation measures for managing pollutant exceedances;
- iii.) monitoring of rainfall;
- iv.) monitoring of discharge frequency and volumes;
- v.) location of monitoring points;
- vi.) frequency of monitoring; and
- vii.) method of monitoring.

U1.8 Contingency options must be developed and included in the Surface Water Mitigation and Monitoring Plan to account for any mitigation options that do not adequately address the site water pollution risks.

U1.9 The Surface Water Mitigation and Monitoring Plan must be approved in writing by the EPA prior to implementation. Appropriate concentration discharge limits, volume discharge limits and ongoing monitoring requirements will be placed as conditions on the Licence and the EPA will consider if additional performance criteria will require licence conditions.

Surface Water Validation Report

U1.10 The Licensee must engage a suitably qualified and experienced person to prepare a Surface Water Validation Report.

U1.11 The Surface Water Validation Report must include, at a minimum:

a.) the results of the Surface Water Mitigation and Monitoring Plan at U1.7;

b.) characterisation of the water discharge quality in accordance with ANZECC (2000) assessment criteria;

c.) demonstration that water quality in each surface water control / management / treatment structure is consistent with its respective design purpose and treatment efficiency and that surface water is being managed in accordance with the discharge conditions of the Licence;

d.) an assessment of the effectiveness of implemented mitigation options;

e.) demonstration that the Licence regulates the discharge of all pollutants that pose a risk of non-trivial harm to human health or the environment;

f.) confirmation that the site water balance including validation of the sediment pond storage and predicted discharge volume is consistent with the potential pollutant risks;

g.) a representative ongoing monitoring program for site discharges.

U1.12 If monitoring shows that water quality or volume discharge is not being managed in accordance with discharge conditions of the Licence, the Mitigation and Monitoring Plan must be updated to:

a.) propose additional mitigation measures to control and / or treat all pollutants that represent a risk of non-trivial harm, including any relevant contingency options identified under U1.8; and

b.) propose a timeframe for the implementation of these additional mitigation measures.

U1.13 The Surface Water Validation Report, must include any further contingency options as necessary and an updated Mitigation and Monitoring Plan must be submitted to the EPA within 3 months of the implementation of mitigation measures agreed to in the Surface Water Mitigation and Monitoring Plan at U1.7.

U1.14 The updated Surface Water Mitigation and Monitoring Plan must be approved in writing by the EPA prior to implementation. Appropriate concentration discharge limits, volume discharge limits and ongoing monitoring requirements will be placed as conditions on the Licence and the EPA will consider if additional performance criteria will require licence conditions.

9 Special Conditions

E1 Air Quality

Air Quality Management Plan

E1.1 Prior to increasing processing up to 1,000,000 tonnes the Licensee must prepare and implement an Air Quality Management Plant (AQMP). The AQMP must include:
(a) Proactive and reactive management strategies.
(b)For all pollutant emission sources, as minimum:

- key performance indicator(s) for emission controls;
- monitoring method(s) including location, frequency and duration;
- response mechanisms;
- responsibilities;
- record keeping; and
- compliance reporting.

Best Practice Management Review for Particle Emissions

E1.2 By no later than 26 May 2017, the Licensee must undertake a site audit, completed by a suitably qualified third party, to identify all fugitive particulate matter emission sources, and benchmark the mitigation

measures against best practice. The objective of the audit is to:
(a) identify fugitive particulate matter emission sources, and rank sources in order of emission potential;
(b) identify and implement proactive and reactive management strategies for each identified particulate matter emission source, for inclusion in the Air Quality Management Plan;
(c) identify the mitigation measures currently applied to each identified emission source;
(d) benchmark the current mitigation measures against best practice performance indicators;
(e) where current mitigation measures are not consistent with best practice, the identification of remedial or upgrade works to mitigate the emission source in line with best practice;
(f) evaluate the practicability of implementing best practice measures; and
(g) propose a timeframe for implementing all practicable best practice mitigation measures.

The methodologies and outcomes of the audit must be contained in a detailed report submitted to the EPA by no later than 30 June 2017.

The Best Practice Management Review for Particle Emissions will be formalised as a condition of the Licence.

E2 Requirement to maintain Financial Assurance

E2.1 (a) A financial assurance in the form of an unconditional and irrevocable and on demand guarantee from a bank, building society or credit union operating in Australia as "Authorised Deposit-taking Institutions" under the Banking Act 1959 of the Commonwealth of Australia and supervised by the Australian Prudential Regulatory Authority (APRA) must be provided to the EPA. The financial assurance must be in favour of the EPA for a total amount to be held by the EPA of seven hundred thousand dollars ($700,000.00). The financial assurance is required to secure or guarantee funding for works or programs required by or under this licence. The financial assurance contains a term that provides that any monies claimed can be paid to the EPA or, at the written direction of the EPA, to any other person.

(b) A financial assurance in the form of an unconditional and irrevocable and on demand guarantee from a bank, building society or credit union operating in Australia as "Authorised Deposit-taking Institutions" under the Banking Act 1959 of the Commonwealth of Australia and supervised by the Australian Prudential Regulatory Authority (APRA) must be provided to the EPA by 30 November 2017 to replace the financial assurance referred to in the previous paragraph (paragraph a). The financial assurance must be in favour of the EPA for a total amount to be held by the EPA of one million, two hundred thousand dollars ($1,200,000.00). The financial assurance is required to secure or guarantee funding for works or programs required by or under this licence. The financial assurance must contain a term that provides that any monies claimed can be paid to the EPA or, at the written direction of the EPA, to any other person.

(c) A financial assurance in the form of an unconditional and irrevocable and on demand guarantee from a bank, building society or credit union operating in Australia as "Authorised Deposit-taking Institutions" under the Banking Act 1959 of the Commonwealth of Australia and supervised by the Australian Prudential Regulatory Authority (APRA) must be provided to the EPA by 30 November 2018 to replace the financial assurance referred to in the previous paragraph (paragraph b). The financial assurance must be in favour of the EPA for a total amount to be held by the EPA of one million, seven hundred thousand dollars ($1,700,000.00). The financial assurance is required to secure or guarantee funding for works or programs required by or under this licence. The financial assurance must contain a term that provides that any monies claimed can be paid to the EPA or, at the written direction of the EPA, to any other person.

E2.2 The financial assurance must be maintained during the operation of the facility and thereafter until such time as the EPA is satisfied the premises is environmentally secure.

E2.3 The EPA may require an increase in the amount of the financial assurance at any time as a result of reassessment of the total likely costs and expenses of rehabilitation of the premises.

E2.4 The EPA may claim on a financial assurance under s303 of the POEO Act if a licensee fails to carry out any work or program required to comply with the conditions of this licence.

E2.5 The financial assurance must be replenished by the full amount claimed or realised if the EPA has claimed on or realised the financial assurance or any part of it to undertake a work or program required to be carried out by the licence which has not been undertaken by the licence holder.

E3 Environmental Obligations of Licensee

E3.1 While the licensee's premises are being used for the purpose to which the licence relates, the licensee must:

a) Clean up any spill, leak or other discharge of any waste(s) or other material(s) as soon as practicable after it becomes known to the licensee or to one of the licensee's employees or agents.
b) In the event(s) that any liquid and non-liquid waste(s) is unlawfully deposited on the premises, such waste(s) must be removed and lawfully disposed of as soon as practicable or in accordance with any direction given by the EPA.
c) Provide all monitoring data as required by the conditions of this licence or as directed by the EPA.

E3.2 In the event of an earthquake, storm, fire, flood or any other event where it is reasonable to suspect that a pollution incident has occurred, is occurring or is likely to occur, the licensee (whether or not the premises continue to be used for the purposes to which the licence relates) must:

a) Make all efforts to contain all firewater on the licensee's premises;
b) Make all efforts to control air pollution from the licensee's premises;
c) Make all efforts to contain any discharge, spill or run-off from the licensee's premises;
d) Make all efforts to prevent flood water entering the licensee's premises;
e) Remediate and rehabilitate any exposed areas of soil and/or waste;
f) Lawfully dispose of all liquid and solid waste(s) stored on the premises that is not already securely disposed of;
g) At the request of the EPA monitor groundwater beneath the licensee's premises and its potential to migrate from the licensee's premises;
h) At the request of the EPA monitor surface water leaving the licensee's premises; and
i) Ensure the licensee's premises is secure.

E3.3 After the licensee's premises cease to be used for the purpose to which the licence relates or in the event that the licensee ceases to carry out the activity that is the subject of this licence, that licensee must:

a) remove and lawfully dispose of all liquid and non-liquid waste stored on the licensee's premises; and
b) rehabilitate the site, including conducting an assessment of and if required remediation of any site

contamination.

E4 EPA may claim on Financial Assurance

E4.1 The EPA may claim on a financial assurance under s303 of the POEO Act if a licensee fails to carry out any work or program required to comply with the conditions of this licence.

Dictionary

General Dictionary

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 months. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.

TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non - putrescible), special waste or hazardous waste

Mr Kieran Horkan

Environment Protection Authority

(By Delegation)

Date of this edition: 21-February-2003

End Notes

1	Licence varied by notice 1028907, issued on 18-Jul-2003, which came into effect on 12-Aug-2003.
2	Licence varied by notice 1056240, issued on 24-Mar-2006, which came into effect on 18-Apr-2006.
3	Condition A1.3 Not applicable varied by notice issued on <issue date> which came into effect on <effective date>
4	Licence varied by notice 1090740, issued on 18-Dec-2008, which came into effect on 18-Dec-2008.
5	Licence varied by notice 1101490, issued on 17-May-2010, which came into effect on 17-May-2010.
6	Licence varied by notice 1116793, issued on 23-Aug-2010, which came into effect on 23-Aug-2010.
7	Licence varied by notice 1531172 issued on 26-Aug-2015
8	Licence varied by notice 1545836 issued on 11-Nov-2016
9	Licence varied by notice 1547157 issued on 13-Dec-2016
10	Licence varied by notice 1547912 issued on 21-Dec-2016
11	Licence fee period changed by notice 1547979 on 21-Feb-2017
12	Licence varied by notice 1558333 issued on 29-Nov-2017
13	Licence varied by notice 1562116 issued on 22-Feb-2018
14	Licence varied by notice 1563876 issued on 23-Apr-2018
15	Licence varied by notice 1566032 issued on 18-Jun-2018
16	Licence varied by notice 1593804 issued on 19-May-2020

Appendix H

Surface water characterisation assessment

Boral Widemere

Surface Water Characterisation Assessment

For: Boral Resources (NSW) Pty Ltd

April 2017

PROJECT INFORMATION

Project Name:	Boral Widemere: Surface Water Characterisation Assessment
Project Number:	PA1554
Report for:	Boral Resources (NSW) Pty Ltd

PREPARATION, REVIEW AND AUTHORISATION

Revision #	Date	Prepared by	Reviewed by	Approved for Issue by
A	4.4.2017	Chris Kuczera		
B	5.4.2017	Chris Kuczera	Pat Carolan, EMM and Boral	Ben Patterson

COMPANY DETAILS

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APPENDICES

EXECUTIVE SUMMARY

Boral Recycling Pty Limited (Boral) operates the Widemere Recycling Facility (the facility). The facility accepts construction and demolition waste, which is separated and crushed onsite before blending with quarry materials to produce saleable construction materials. On 25 November 2016, Boral received conditional consent to increase the processing capacity of the facility to 1,000,000 tonnes per annum (Consent SD 6525). The consent included 27 consent conditions associated with site water management. In addition to the consent conditions, The NSW Environmental Protection Authority (EPA) modified the facility's Environmental Protection Licence (EPL no.11815). The modified EPL included a Pollution Reduction Program (PRP).

This report documents a Surface Water Characterisation Assessment (SWCA) and addresses the requirements of EPL Conditions U1.2, U1.3 and U1.4 which form part of the PRP. Broadly the SWCA is required to characterise the surface water quality within the facility and assess the facility's potential to impact the quality of receiving waters.

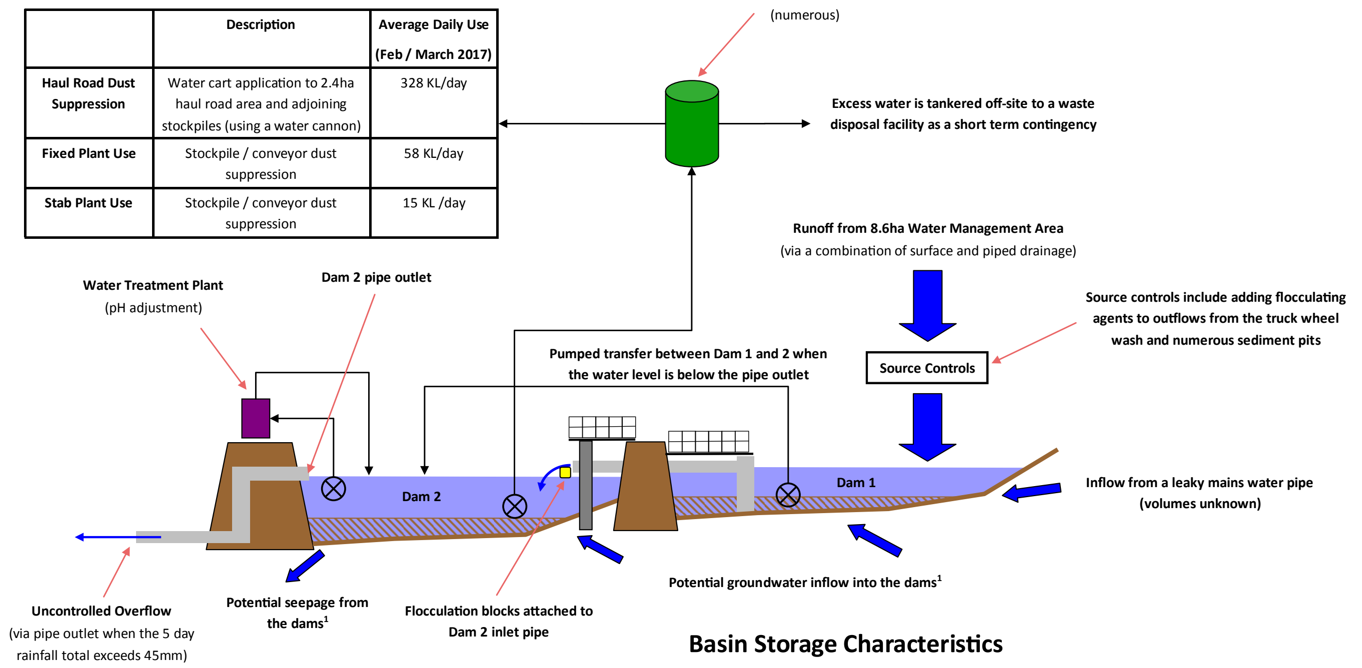
Overview of the Facility's Surface Water Management System

The following figure diagrammatically describes the functionality of the facility's existing water management system. Site overflows occur from Dam 2 when the water level in Dam 2 exceeds the invert level of the outlet pipe. **Section 3** of this report provides further information on the facility's existing water management system.

Existing Surface Water Regime

Summary of site water use

	Description	Average Daily Use (Feb / March 2017)
Haul Road Dust Suppression	Water cart application to 2.4ha haul road area and adjoining stockpiles (using a water cannon)	328 KL/day
Fixed Plant Use	Stockpile / conveyor dust suppression	58 KL/day
Stab Plant Use	Stockpile / conveyor dust suppression	15 KL /day



Basin Storage Characteristics

	Dam 1	Dam 2	Combined
Sediment Storage (KL)	730	641	1,371
Water Storage (KL)	757	1,098	1,855
Total (KL)	1,487	1,739	3,226

Volumes calculated from detailed topographic survey

🟦	**Water Storage** (storage volume between pump intake levels and the outlet pipe invert)
▨	**Sediment Storage** (storage volume below the pump intake level, reserved for the storage of accumulated sediment)

Note 1: Boral will provide further information on potential groundwater interaction with Dams 1 and 2 in a separate document

Overview of Receiving Water

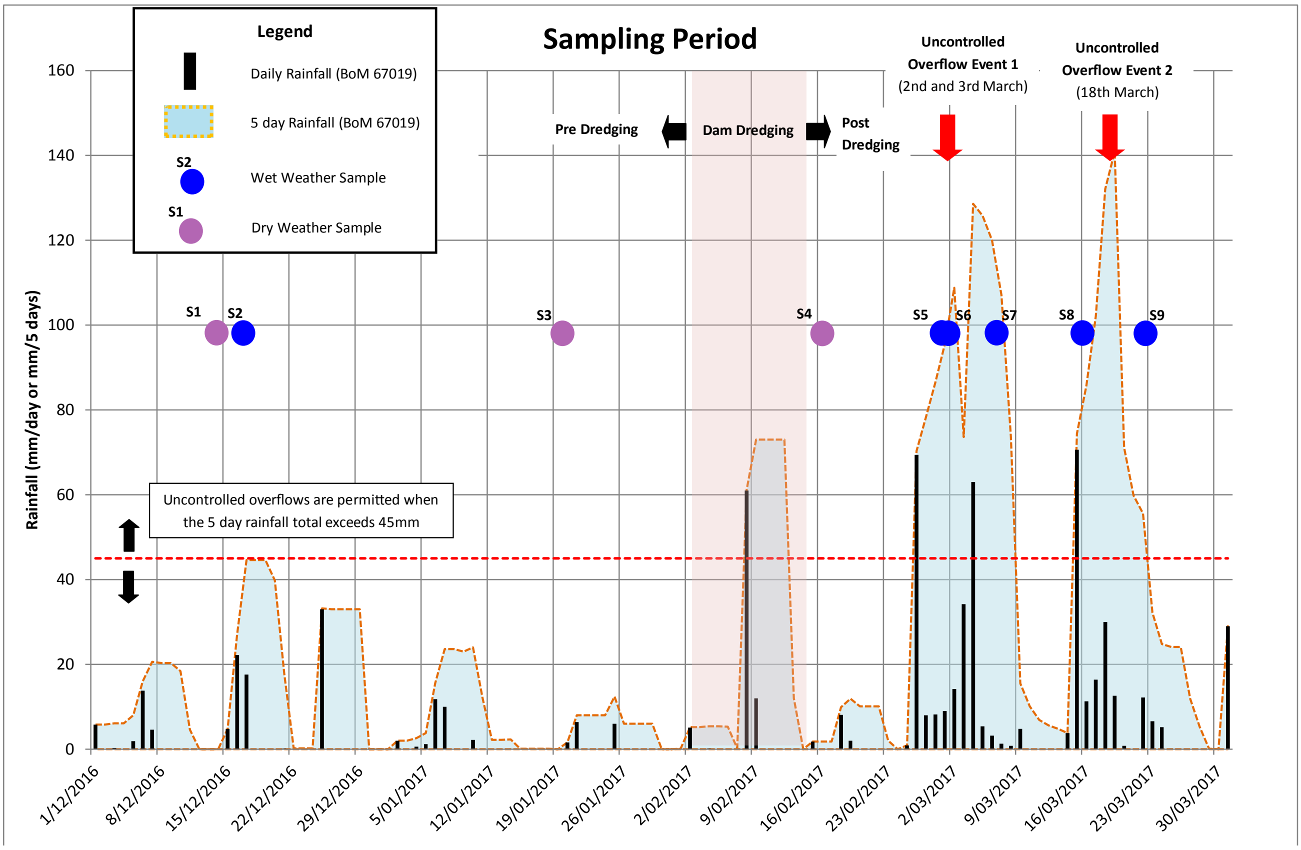
Overflows from the facility enter Prospect Creek, immediately upstream of the Widemere Road Bridge. The Prospect Creek Catchment area (upstream of the bridge) is estimated to be 1,036 ha. Accordingly, the facility's 8.6ha Water Management Area forms 0.8% of the contributing catchment area at the site overflow location. Aerial imagery indicates that land uses within the catchment comprise a mixture of vegetated areas (40%), industrial areas (50%) and urban areas (10%). The creek channel and riparian zones have been highly modified, with significant reaches of concrete lined channel established. Due to these significant modifications to the catchment and watercourse, Prospect Creek is considered to be a highly disturbed watercourse.

Overview of Water Quality Sampling Regime

This SWCA is informed by 9 surface water sampling events that were undertaken between 14 December 2016 and 23 March 2017. The initial portion of the period was characterised by unusually hot conditions, with moderate amounts of rainfall. A significant amount of rainfall occurred in late February and throughout March. This substantial rainfall resulted in uncontrolled overflows occurring on the 2nd and 3rd of March and again on the 18th of March. The 5 day rainfall total during both overflow events was in excess of 100mm, comfortably above the 45mm five day rainfall total that is specified as the permissible discharge threshold in both the EPL (Condition L1.2) and Consent Conditions (no.25). 6 of the 9 sampling events were undertaken during wet weather conditions.

Boral engaged a dredging contractor to dredge accumulated sediment in Dams 1 and 2. This was undertaken over a 13 day period from the 3 to 15 of February 2017. 6 of the 9 sampling events were undertaken following the completion of dredging, exceeding the minimum requirement of 5 post dredging samples that is specified in the EPL (Condition U1.4c).

The following figure shows the sampling dates relative to both the daily and 5 day rainfall totals, the dredging period and the two uncontrolled overflow events that occurred over the period.



Sample Analysis and Trigger Level Development

Most samples were tested for a comprehensive suite of over 400 analytes. Trigger values were established by Victory Engineering for each detected contaminants using the methods documented in the ANZECC (2000) Guidelines for slightly-to-moderately disturbed ecosystems. These trigger values provide a conservative reference for water quality that is unlikely to cause environmental harm to a slightly-to-moderately disturbed watercourse.

Water Quality Results Summary

All water quality results in Dam 2 were compared to the trigger values to identify analytes of concern. This process identified the following analytes that exceeded trigger values (by varying amounts) in Dam 2 on at least one occasion:

- pH
- Suspended Solids.
- Nutrients (Total Phosphorous, Total Nitrogen, Ammonia and Nitrate (NOx).
- Dissolved Metals (Al, Ba, Cr (VI), Cu, Sr, Va and Hexavalent Chromium).
- Fluoride, Cyanide and Chlorine.
- Phenolics (2-Methylphenol, 3&4-methylphenol and 2,4-Dimethylphenol).
- Carbendazim and Anionic Surfactants.

Refer to **Sections 5.2** and **5.3** of this report for detailed information on the identified analytes of concern.

Assessment of Potential Impacts

An assessment of the facility's potential to impact receiving water quality is documented in **Section 5.4** of this report. The assessment concluded that:

- The performance of the facility's water management system over the monitoring period indicates that site overflows are only likely to occur during significant wet weather periods, when substantial flows in Prospect Creek would be occurring.
- The facility's 8.6 ha Water Management Area is equivalent to only 0.8% of the contributing Prospect Creek Catchment area at the facility's overflow location. By virtue of dilution, it is expected that any overflows from the facility will not materially alter the water quality in Prospect Creek during wet weather. However, it is acknowledged that overflows from the site are likely to contribute to the cumulative degradation of water quality in Prospect Creek during wet weather conditions.
- Potential for impacts to Prospect Creek water quality would increase if Dam 2 water is discharged outside of significant wet weather periods (i.e. via controlled discharges). Controlled discharges are currently not permitted by EPL (Condition U1) and no controlled discharges occurred over the monitoring period.

Future Investigations and Analysis

The PRP requires that Boral prepare a Surface Water Monitoring and Mitigation Plan (SWMMP). This document will include:

- A holistic review of the existing water management system. This review will be informed by the outcomes of the SWCA and a calibrated water balance model of the facility's water management system.
- An assessment of the effectiveness and benefits of a range of water management improvement options. The outcomes of this options assessment exercise will be used to justify any proposed changes to the existing water management system.
- A proposed surface water monitoring and reporting program.

The SWMMP will be informed by the water quality data that is presented in this SWCA.

ABBREVIATIONS

AHD	*Australian Height Datum*
ALS	*Australian Laboratory Services*
ANZECC	*Australian and New Zealand Guidelines for Fresh and Marine Water Quality*
BoM	*Bureau of Meteorology*
Boral	*Boral Recycling Pty Limited*
COA	*Certificate of Analysis*
C_v	*Volumetric Runoff Coefficients*
ECL	*Environmental Concern Level*
EMC	*Event Mean Concentration*
EMM	*EMM Consulting Pty Limited*
EPA	*NSW Environment Protection Authority*
EPL	*Environmental Protection License*
IEAust	*Institution of Engineers Australia*
LOR	*Limit of Reporting*
ML	*Megalitre*
PRP	*Pollution Reduction Program*
SWCA	*Surface Water Characterisation Assessment*
SWMMP	*Surface Water Monitoring and Mitigation Plan*
RHDHV	*Royal HaskoningDHV*
The Facility	*Boral Widemere Materials Recycling Facility*

1 INTRODUCTION

Boral Recycling Pty Limited (Boral) operates the Widemere Recycling Facility (the facility), at Wetherill Park in the Fairfield Local Government Area. The site location is shown in **Figure 1**. The facility accepts construction and demolition waste, which is separated and crushed onsite before blending with quarry materials to produce saleable construction materials.

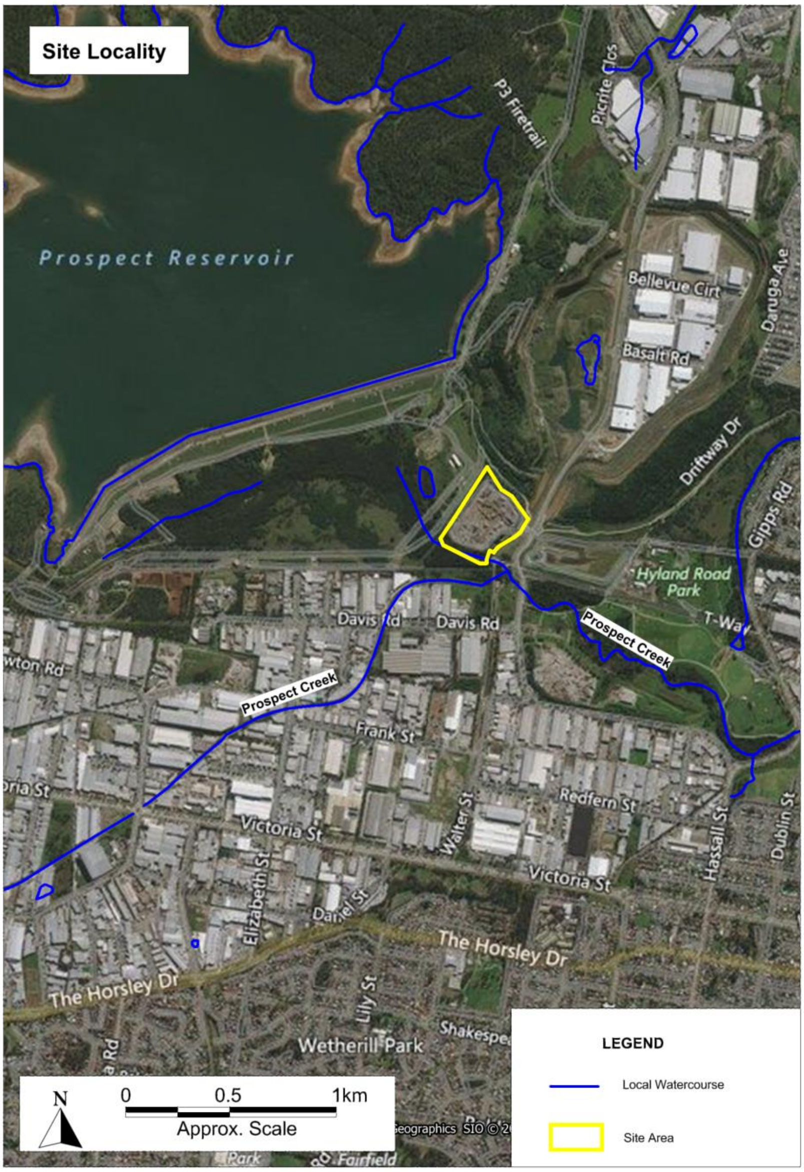


Figure 1 – *Site Locality*

On 25 November 2016, Boral received conditional consent to increase the processing capacity of the facility to 1,000,000 tonnes per annum (Consent SD 6525). The consent included 27 consent conditions associated with site water management. In addition to the consent conditions, The NSW Environmental Protection Authority (EPA) modified the facility's Environmental Protection Licence (EPL no.11815). The modified EPL included a Pollution Reduction Program (PRP). Collectively, the development consent conditions and the modified EPL require Boral to prepare the following water management related documents:

- **Surface Water Characterisation Assessment (SWCA):** This document is to be informed by surface water monitoring and is required to characterise the surface water quality within the facility and assess the facility's potential to impact the quality of receiving waters.

- **Surface Water Monitoring and Mitigation Plan (SWMMP):** This document will include:

  - A holistic review of the existing water management system. This review will be informed by the outcomes of the SWCA and a calibrated a water balance model of the facility's water management system.

  - An assessment of the effectiveness and benefits of a range of water management improvement options. This options assessment exercise will be used to justify any proposed changes to the existing water management system.

  - A proposed surface water monitoring and reporting program.

- **Surface Water Validation and Audit Reports:** These documents will be prepared following the implementation of any approved changes to the facility's water management system. These documents will be informed by water quality and level data and will assess the effectiveness of the implemented surface water management system in complying with development consent and EPL conditions.

This document addresses the SWCA that is required under EPL Condition U1.

1.1 Report Overview

This report documents the SWCA. The report is structured as follows:

- **Section 2** discusses the objectives and framework of the SWCA.
- **Section 3** describes the existing surface water management system.
- **Section 4** describes the surface water quality sampling and analysis methodologies and climatic and site conditions during the sampling period.
- **Section 5** presents and analyses the water quality monitoring results and addresses the SWCA assessment requirements that are specified in the EPL.

This report has been prepared to concisely address the SWCA assessment requirements that are specified in the EPL. Supporting information is provided in the following appendices:

- **Appendix A** provides all water quality monitoring results.

- **Appendix B** provides detailed information on the establishment of trigger values for analytes that do not have default trigger values recommended in the ANZECC (2000) guidelines.

- **Appendix C** lists all analytes sampled and associated Limits of Reporting (LOR).

- **Appendix D** lists all analytes sampled and adopted laboratory analytical methods.

- **Appendix E** contains Certificates of Analysis (COA) that were provided by the laboratory for all sampling undertaken.

- **Appendix F** provides relevant correspondence from Boral and the EPA

1.2 Acknowledgements

This report has been prepared by Royal HaskoningDHV (RHDHV) with input from Victory Engineering, EMM Consulting (EMM) and Boral. Victory Engineering supervised the execution of the water quality sampling program and collated and analysed all results. They also established trigger values for detected analytes. Victory Engineering prepared the appendices for this report.

Water quality sampling was undertaken primarily by Boral, with some additional surface water sampling undertaken by EMM when collecting groundwater samples.

2 ASSESSMENT FRAMEWORK

The SWCA is part of the PRP that is specified in EPL 11815. EPL Conditions U1.2, U1.3 and U1.4 detail the required scope of the SWCA. **Table 2-1** reproduces the assessment conditions stated in the EPL and provides information on how each requirement has been addressed by Boral.

***Table 2-1** – Summary of water management related EPL conditions.*

EPL Condition	Requirement	How has this requirement been addressed by Boral
U1.2	The Licensee must engage a suitably qualified and experienced person to prepare a Surface Water Discharge Characterisation Assessment.	Boral have engaged RHDHV and Victory Engineering to prepare the SWCA.
U1.3	The Surface Water Discharge Characterisation Assessment must be submitted to the EPA by 31 March 2017.	The EPA has agreed to a revised submission date of Wednesday 5 April 2017.
U1.4	The Surface Water Discharge Characterisation Assessment must include, at a minimum:	
U1.4 a)	a) identification of all the potential pollutants of concern which may be present in a discharge from the Premises. This list is to be developed in consultation with the EPA.	Boral provided a list of potential pollutants of concern to the EPA in a letter dated 12 December 2016. EPA agreed that the list of pollutants was appropriate. Relevant correspondence is provided in **Appendix F**.
U1.4 b)	b) water sampling and reference to all relevant existing data for all identified potential pollutants of concern in the sediment basin or site discharges, including but not limited to: i. a full suite of current analytes from the Surface Water Monitoring and Mitigation Plan; ii. a full suite of metals, including aluminium, boron, silver and tin; iii. any other potential pollutants such as current or proposed treatment chemical residuals.	Boral collected 9 samples from the lower sedimentation dam (referred to as Dam 2) between mid-December 2016 to the end of March 2017. Each sample was tested for a full suite of analytes. Refer to **Section 4** of this report for further information on the sampling regime.
U1.4 c)	c) sufficient sampling to capture the full variability of water quality at the Premises, including average or typical through to worst case scenarios, guided by protocols to ensure that sampling events are triggered by the full range of operational processes that would materially impact water quality, and be linked to ongoing implementation of mitigation measures, e.g. representative data before and after dredging of sediment basins. As a minimum the Licensee must: i. undertake 5 independent sampling events within the sediment basin (post dredging); and ii. collect samples that coincide with significant runoff events before 3 February 2017.	Boral collected 9 samples from the lower sedimentation dam (referred to as Dam 2) between mid-December 2016 to the end of March 2017. 6 of the 9 samples were collected post dredging and 7 of the 9 samples were collected during wet weather conditions. Refer to **Section 4** of this report for further information on the sampling regime.

EPL Condition	Requirement	How has this requirement been addressed by Boral
U1.4 d)	d) an assessment of the potential impact of discharges on receiving waters, based on the surface water characterisation and with reference to ANZECC (2000) assessment criteria for slightly-to moderately disturbed ecosystems and the NSW Water Quality Objectives for Prospect Creek (note that the ANZECC (2000) toxicant decision tree can be used to refine the default trigger values (See Section 3.4.3.2 "Decision tree for applying the guideline trigger values")).	The water quality monitoring results were assessed with reference to the ANZECC (2000) Guidelines. Refer to **Section 5** of this report for further information on the surface water monitoring results and associated potential impacts associated with site discharges.
U1.4 e)	e) Specify the analytical limits of reporting used for any existing and new data that is being assessed and: i. compare that limit of reporting to the relevant ANZECC (2000) assessment criteria for slightly-to moderately disturbed ecosystems; ii. where the limit of reporting does not provide a suitable basis for assessing risk of water pollution, propose alternative options to characterise the risk, including more sensitive laboratory testing or risk mitigation options.	Laboratory analytical methods were selected based on advice from ALS Environmental (Sydney). Where possible, the adopted laboratory analytical methods were selected to achieve Limits of Reporting (LOR) that were at or below the adopted trigger levels. Unavoidable exceptions were Chlorine, Bis(2-ethylhexyl) phthalate (DEHP) and Di-n-Octylphthalate. Refer to **Section 4** of this report for further information on the sampling and analysis approach.
U1.4 (general)	The level of reporting for concentrations of pollutants should be sensitive enough to detect pollutants at levels related to their environmental risk and ANZECC (2000) toxicant trigger value (where available) while having regard to the best available analytical practical quantification limits using available technology.	See response for U.1.4 e)
U1.4 (general)	Sampling and analysis for the characterisation must be in accordance with the Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (2004).	Sampling and analysis has generally been undertaken in accordance with the guideline titled Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (2004). Refer to **Section 4** of this report for further information on the sampling and analysis approach.

3 EXISTING SURFACE WATER MANAGEMENT SYSTEM

The existing water management system manages runoff from an 8.6 ha Water Management Area. Runoff from this area drains to a sedimentation basin (referred to as Dam 1) via a combination of piped and surface drainage. Dam 1 overflows into a second sedimentation basin (referred to as Dam 2). **Figure 2** shows a site drainage plan that depicts the extent of the Water Management Area and location of stormwater management infrastructure.

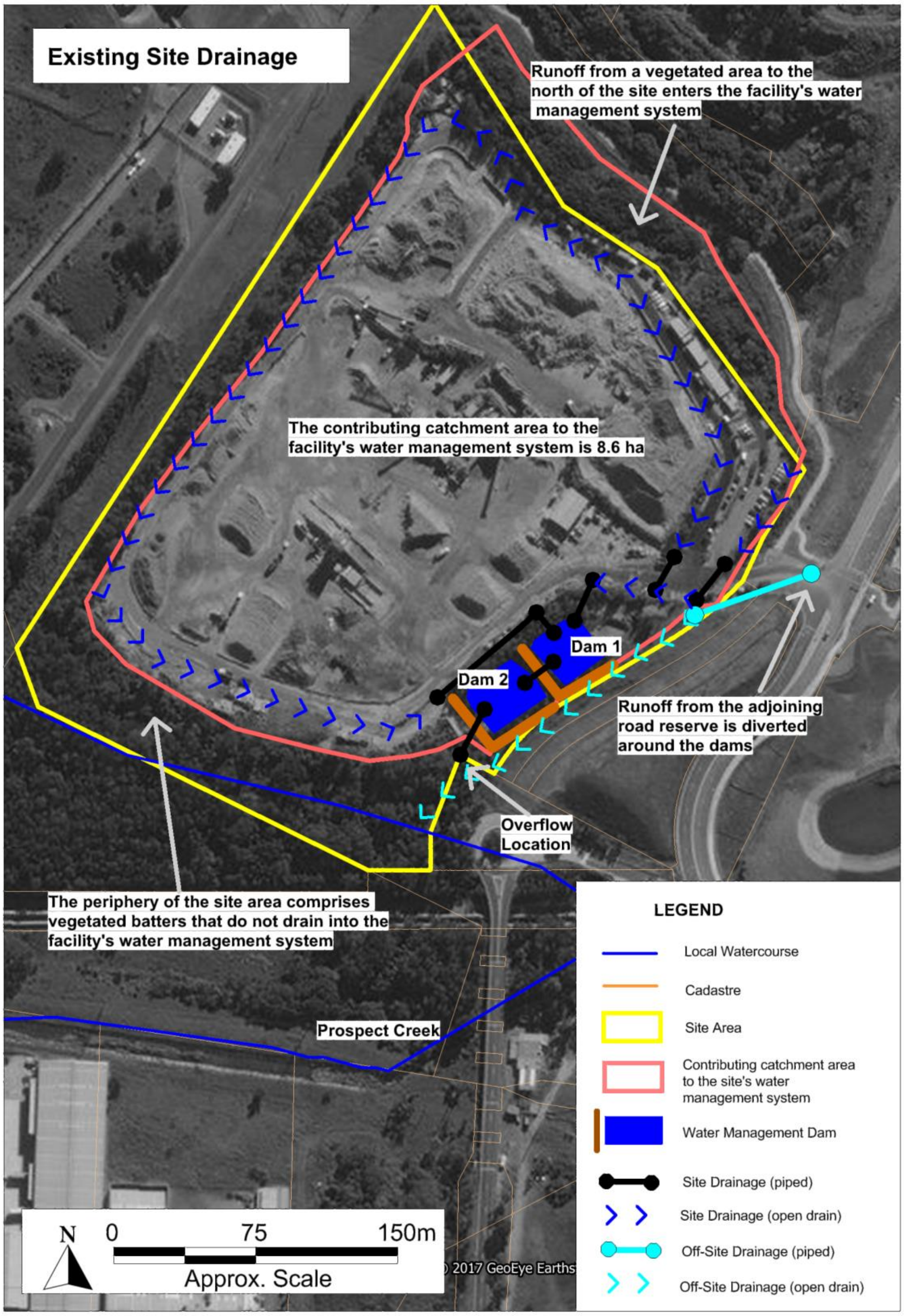
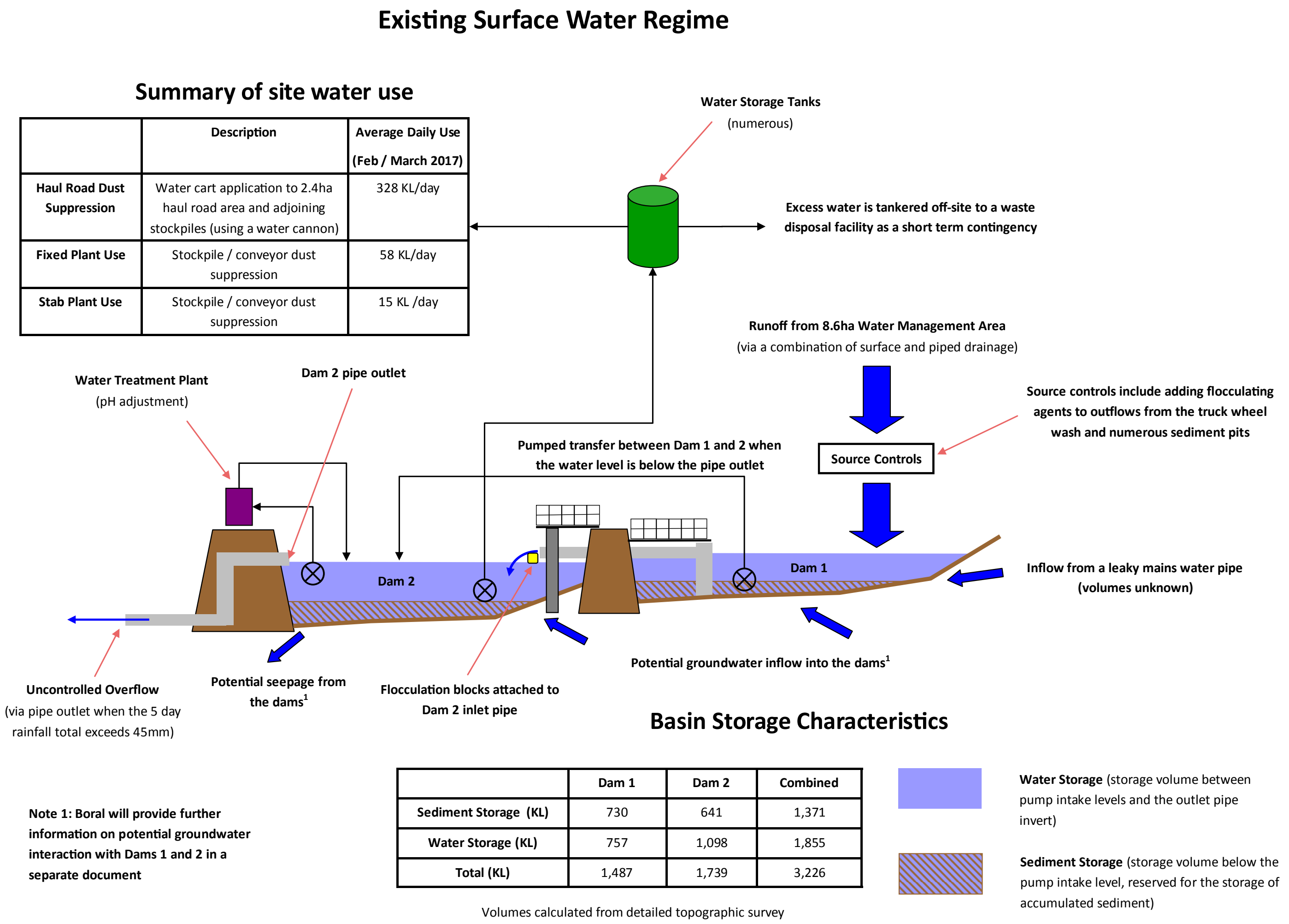


Figure 2 – *Existing Site Drainage*

Dams 1 and 2 are the primary water management controls for the site. Collectively the dams are estimated to provide 1.4ML of sediment storage and 1.8ML of water storage. The dams are progressively dewatered to provide water for onsite haul road, stockpile and conveyor dust suppression. This substantially reduces the frequency and magnitude of site overflows. Uncontrolled overflows from Dam 2 occur when the water level reaches the invert of the dam's outlet pipe. Uncontrolled overflows are permitted under EPL Condition L1.2 only when the preceding 5 day rainfall total exceeds 45mm.

Figure 3 diagrammatically describes the functionality of the existing water management system.



Summary of site water use

	Description	Average Daily Use (Feb / March 2017)
Haul Road Dust Suppression	Water cart application to 2.4ha haul road area and adjoining stockpiles (using a water cannon)	328 KL/day
Fixed Plant Use	Stockpile / conveyor dust suppression	58 KL/day
Stab Plant Use	Stockpile / conveyor dust suppression	15 KL /day

Basin Storage Characteristics

	Dam 1	Dam 2	Combined
Sediment Storage (KL)	730	641	1,371
Water Storage (KL)	757	1,098	1,855
Total (KL)	1,487	1,739	3,226

Volumes calculated from detailed topographic survey

Figure 3 – *Existing Water Management System*

As noted in **Figure 3**, the existing water management system includes the following water quality controls:

- Numerous sediment pits have been established throughout the site. These pits are frequently cleaned out to reduce sediment loads entering the downstream dams.
- Flocculating agents are applied to outflows from the truck wheel wash.
- All runoff from the 8.6 ha Water Management Area enters Dam 1, which provides primary sedimentation treatment.

- Dam 1 overflows into Dam 2 via a pipe outfall arrangement. Dam 2 provides additional sedimentation treatment. Dam 2 also includes the following additional treatment measures:
    - Inflows into Dam 2 spill over a rack of flocculating blocks, which are intended to slowly release flocculating agent.
    - Water is progressively pumped from Dam 2 and treated in a water treatment plant (acid dosing plant) that adjusts pH. Treated water is returned to Dam 2. It is noted that this treatment system was not operated during the sampling period to avoid any potential interference with the water quality sampling program.

The effectiveness of the existing water management controls is discussed further in **Section 5.**

3.1 Local Watercourses

Overflows from the facility enter Prospect Creek, immediately upstream of the Widemere Road Bridge. The Prospect Creek Catchment area (upstream of the bridge) is estimated to be 1,036 ha. Accordingly, the facility's 8.6ha Water Management Area forms 0.8% of the contributing catchment area at the site overflow location. Aerial imagery indicates that land uses within the catchment comprise a mixture of vegetated areas (40%), industrial areas (50%) and urban areas (10%). The creek channel and riparian zones have been highly modified, with significant reaches of concrete lined channel established. Due to these significant modifications to the catchment and watercourse, Prospect Creek is considered to be a highly disturbed watercourse.

Figure 4 shows the Prospect Creek Catchment area.

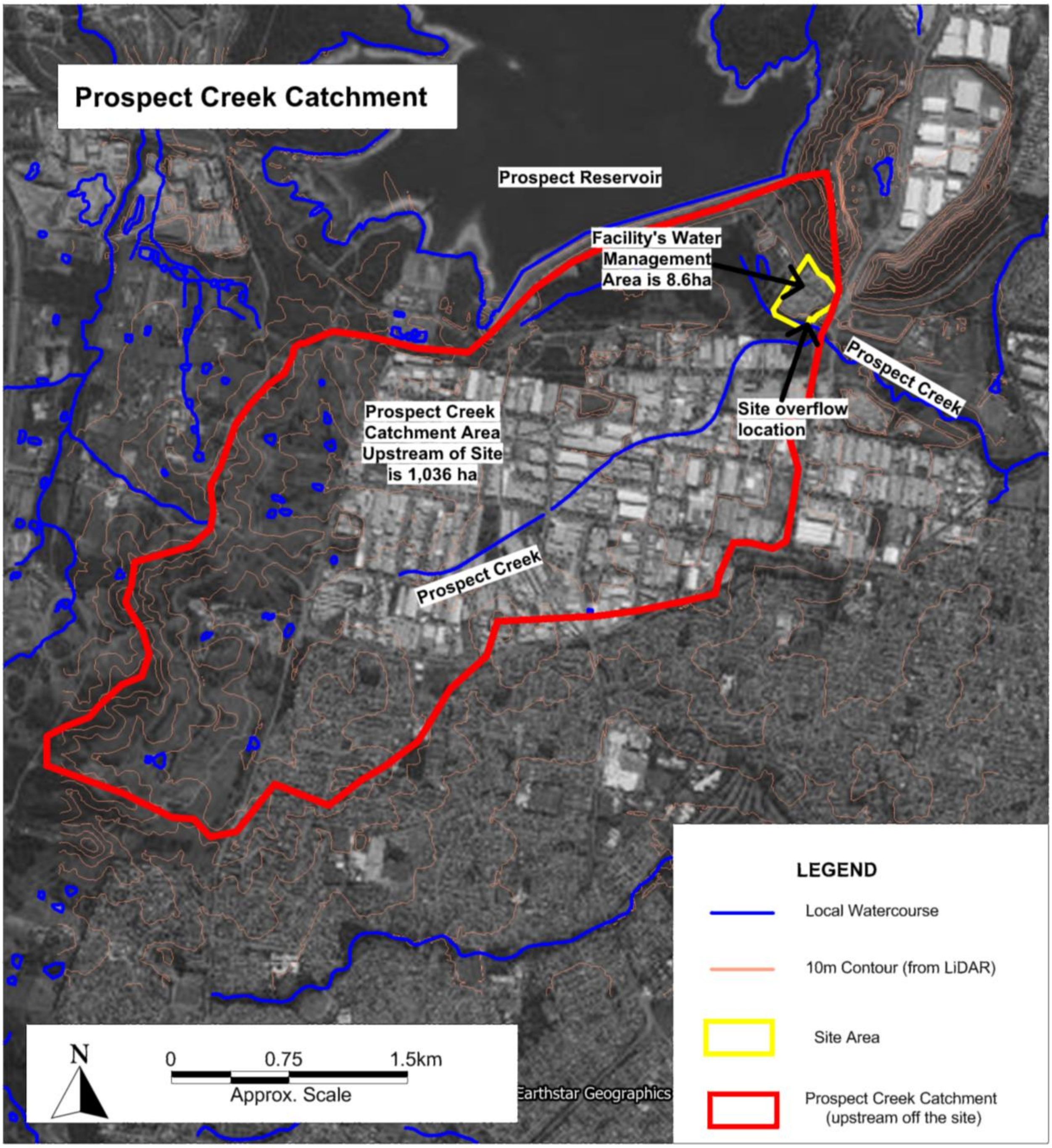


Figure 4 – *Prospect Creek Catchment*

4 SAMPLING AND ANALYSIS METHODS

Surface water samples were collected from a number of locations within the surface water management system as well as from Prospect Creek. This section describes the surface water sampling and analysis methods and is structured as follows:

- **Section 4.1** provides information on sampling locations and objectives.
- **Section 4.2** describes the sampling period, providing information on the climate, dam water levels and overflows and dam dredging that occurred over the period.
- **Section 4.3** provides information on the methodology applied to establishing trigger levels and analytical testing methods.

4.1 Sampling Locations

Surface water samples were collected from five sampling locations. **Figure 5** shows the sampling locations and **Table 4-1** provides information on the sampling method and objective at each location.

***Table 4-1** – Sampling Locations and Objectives.*

Sample Locations	Sample Method	Sampling Objective
Dam 1 inflow	Grab samples were taken from inflows into Dam 1.	To characterise the quality of untreated site runoff.
Dam 1 inflow (small)	Grab samples were taken from inflows into Dam 1 from the leaky mains water pipe (as described in **Figure 3**).	To characterise the quality of water entering Dam 1 from the leaky mains water pipe (as described in **Figure 3**).
Dam 1	Grab samples were taken from the Dam 1 waterbody.	To characterise the quality of water in Dam 1.
Dam 2	Grab samples were taken from the Dam 2 waterbody.	To characterise the quality of water in Dam 2. Dam 2 water quality during wet weather conditions is considered to be representative of the quality of any uncontrolled overflows that may occur from Dam 2.
Prospect Creek (upstream)	Grab samples were taken from Prospect Creek, upstream of the facility's overflow location.	To characterise the quality of water in Prospect Creek

Figure 5 – *Sampling Locations (figure provided by Victory Engineering).*

4.2 Sampling Period

This SWCA is informed by nine surface water sampling events that were undertaken between 14 December 2016 and 23 March 2017 (a 100 day period). The mid-December to mid-February portion of the sampling period was characterised by unusually hot conditions, with moderate amounts of rainfall. No site overflows occurred during this portion of the period.

A significant amount of rainfall occurred in late February and throughout March, with 426 mm of rainfall recorded between 26 February 2017 to the end of March 2017 at the Bureau of Meteorology (BoM) operated rainfall gauge at Prospect Reservoir (BoM: 67019). This rainfall gauge is located 1.5km to the north of the facility and is the most representative rainfall data available for the period. The recorded monthly rainfall total for March was 335mm, exceeding the 95th percentile monthly rainfall of 292mm that has been calculated by BoM from the gauge record. This substantial rainfall resulted in uncontrolled overflows occurring on the 2nd and 3rd of March and again on the 18th of March. The 5 day rainfall total during both overflow events was in excess of 100mm, comfortably above the 45mm five day rainfall total that is specified as the permissible discharge threshold in both the EPL (Condition L1.2) and Consent Conditions (no.25).

Boral engaged a dredging contractor to dredge accumulated sediment in Dams 1 and 2. This was undertaken over a 13 day period from 3 to 15 February 2017. 6 of the 9 sampling events were undertaken following the completion of dredging, exceeding the minimum requirement of 5 post dredging samples that is specified in the EPL (Condition U1.4c).

Figure 6 shows the sampling dates relative to both the daily and 5 day rainfall totals, the dredging period and the two recorded uncontrolled overflow events.

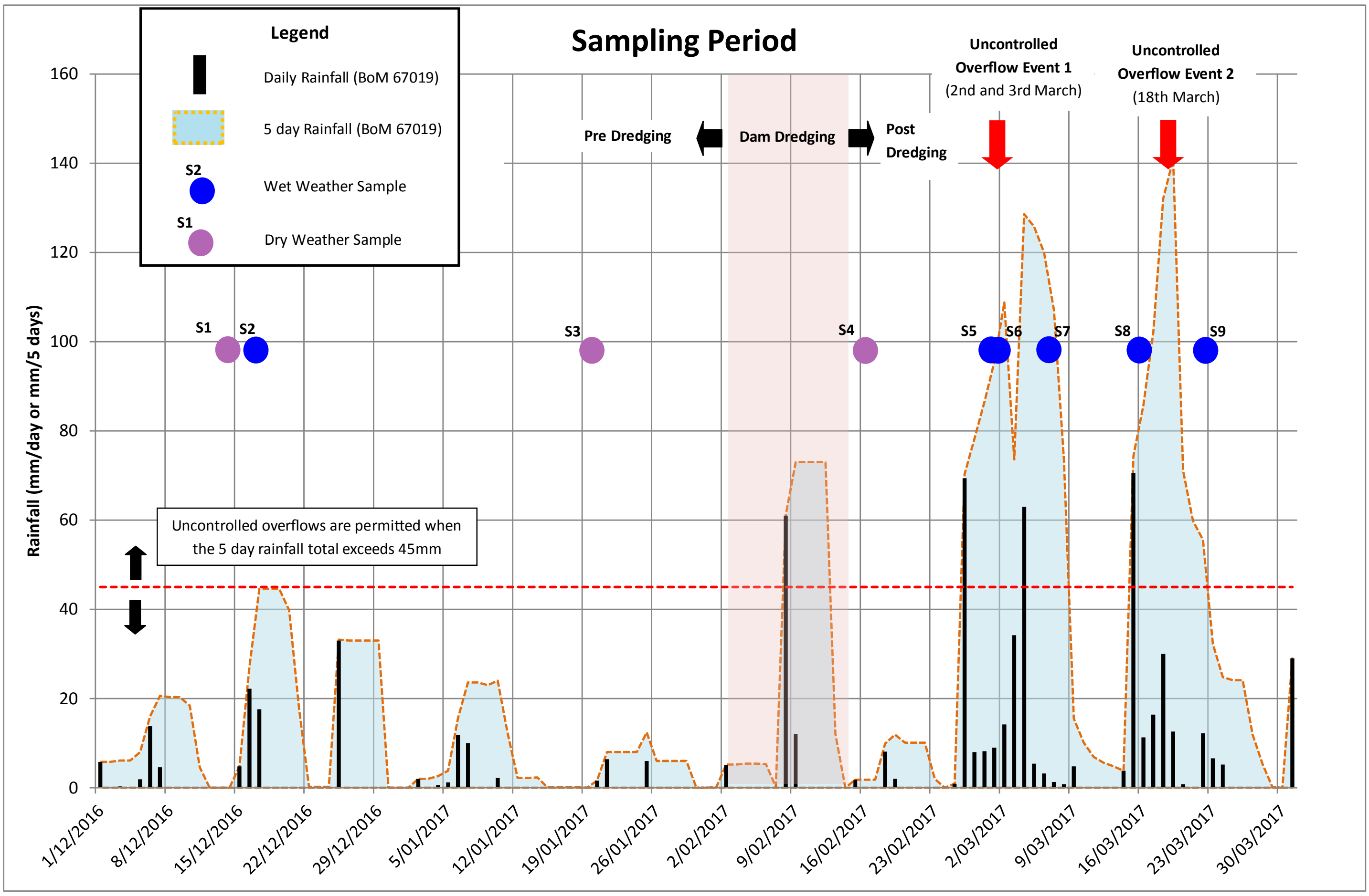


Figure 6 – *Sampling period summary*

Table 4-2 provides detailed information on each sampling event, including locations sampled, dam dredging context, a summary of recent rainfall levels and the Dam 2 condition at the time of sampling. Each Sampling event is also classified as either a dry or wet weather sample based on the preceding rainfall at the time of sampling.

It is noted that two additional sampling events (B1 and B2) were undertaken by Boral over the period. These sampling events did not sample from Dam 2 and are therefore not considered in the analysis undertaken in this report. Notwithstanding, associated results are provided in the report appendices. Information on these two sampling events is provided in **Table 4-2**.

***Table 4-2** - Sampling Context*

Sample ID	Sample Date	Sampled Locations	Dredging Context	Rainfall Context	Dam 2 Context
S1	14/12/16	Dam 2	Pre-dredging	No recent rainfall. **Dry Weather Sample**	Low water level
S2	16/12/16	Dam 2 Prospect Creek	Pre-dredging	Recent heavy rainfall (26mm). **Wet Weather Sample**	50% Full
S3	20/1/17	Dam 1 Inflow Dam 2	Pre-dredging	Minor rainfall (less than 2mm). **Dry Weather Sample**	Low water level
S4	17/2/17	Dam 2 Dam 1 Inflow	Post dredging	Minor Rainfall (less than 2mm). **Dry Weather Sample**	50% Full
S5	1/3/17	Dam 2 Dam 1 Inflow	Post-dredging	Recent heavy rain (96 mm over 4 days); water had also been pumped from Dam 1 to Dam 2). **Wet Weather Sample**	Almost Full
S6	2/3/17	Dam 2	Post-dredging	Recent heavy rain (109 mm over 5 days). **Wet Weather Sample**	Full and overflowing
S7	7/3/17	Dam 2	Post-dredging	Recent light rain, after heavy rainfall that occurred between 26.2.17 to 4.3.17. **Wet Weather Sample**	Almost Full
S8	17/3/17	Dam 2 Prospect Creek	Post-dredging	Recent heavy rain (98 mm over 3 days). **Wet Weather Sample**	Almost Full, uncontrolled overflows occurred the day after sampling
S9	23/3/17	Dam 2	Post-dredging	Recent heavy rain (19 mm over 2 days). **Wet Weather Sample**	Almost Full
Additional Sampling Events that did not sample from Dam 2					
B1	1/2/17	Dam 1	Pre-dredging	No recent rainfall. **Dry Weather Sample**	Low water level
B2	8/2/17	Dam 1	During dredging	Recent heavy rainfall (61mm on the sampling day). **Wet Weather Sample**	Almost Full

In summary:

- 6 of the 9 sampling events were undertaken during wet weather conditions. The results from these sampling events can be used to assess the effectiveness of the facility's water management system and the potential for overflows from the facility to impact receiving waters. This assessment is documented in **Section 5**.

- 6 of 9 samples were collected following the completion of dredging.

Accordingly, the sampling regime complies with EPL Condition U1.4 c).

4.3 Sample Analysis Methodology

Most samples were tested for a comprehensive suite of over 400 analytes. The list of analysts was approved by the EPA. **Table A1** in **Appendix A** provides a full list of all analytes tested. This section describes the sample analysis methodology.

4.3.1 Trigger Level Development

EPL Condition U1.4(d) requires that potential impacts associated with site discharges to receiving waters are assessed. The assessment is to reference ANZECC (2000) trigger values for slightly-to moderately disturbed ecosystems. Accordingly, trigger values were established by Victory Engineering for each detected contaminant using the methods documented in the ANZECC (2000) Guidelines for slightly-to moderately disturbed ecosystems.

The ANZECC (2000) Guidelines do not include default trigger values for all the detected analytes. For analytes that do not have default trigger values, Environmental Concern Levels (also referred to as low-reliability trigger levels) were calculated by Victory Engineering for these analytes. All calculations are provided in **Appendix B**.

It is noted that for analytes where the aquatic toxicity is deemed by the ANZECC (2000) Guidelines to be hardness dependent, calculations were made by Victory Engineering to modify the default trigger values provided in Table 3.4.1 of the guideline. The calculations were made in accordance with the methods provided in the ANZECC (2000) Guidelines. Corrections for water hardness are a function of the assumed quality of the receiving waters. Water quality data indicates that the hardness of water in Prospect Creek (ranging from 84 to 140 mg/l) is generally higher than the hardness of water in Dam 2 (ranging from 15 to 111 mg/l). As Prospect Creek is the receiving water, total hardness is theoretically the appropriate figure to utilise, as the flow in Prospect Creek will significantly dilute any water that overflows from the facility. However, the average Dam 2 hardness (48 mg/l) was adopted for making hardness adjustments to trigger values, producing more conservative trigger values than if the higher Prospect Creek hardness value was used.

Table A1 in **Appendix A** lists the source of each trigger value established by Victory Engineering. The adopted trigger value and further information on its derivation is provided in results **Tables A2** and **A3** in **Appendix A**, along with all water quality results that were above detection limits.

4.3.2 Laboratory Analytical Methodology

Laboratory analytical methods were selected based on advice from Australian Laboratory Services (ALS). The majority of analysis was conducted on a "dissolved" basis, in accordance with Section 4.4.4.3 / 2 of the ANZECC (2000) Guidelines. The adopted analytical methods are provided in **Table D1** in **Appendix D**.

Where possible, the adopted laboratory analytical methods were selected to achieve Limits of Reporting (LOR) that were at or below the adopted trigger levels. Unavoidable exceptions were:

- Chlorine, which has an ANZECC (2000) trigger value of 3 ug/L. ALS advised that the minimum achievable LOR is 20 ug/L.
- Bis(2-ethylhexyl) phthalate (DEHP) has a low-reliability ANZECC (2000) trigger of 1 ug/L. ALS advised that the minimum achievable LOR is 10 ug/L.
- Di-n-Octylphthalate has a calculated low-reliability trigger of 0.9 ug/L. ALS advised that the minimum achievable LOR is 2 ug/L.

A list of all analytes tested and associated LOR are provided in **Table C1** in **Appendix C**.

5 SURFACE WATER QUALITY RESULTS AND ANALYSIS

This section presents and reviews the water quality monitoring results and is structured as follows:

- **Section 5.1** describes the approach to presenting and analysing the water quality results.
- **Section 5.2** presents key water quality results in consolidated tables.
- **Section 5.3** discusses the results.
- **Section 5.4** discusses potential water quality impacts associated with site overflows and outlines additional information that will be provided in the SWMMP.

5.1 Analysis and Assessment Approach

As described in **Section 4**, the sampling program comprised 9 sampling events. Each sampling event comprised up to 5 samples. Some samples were tested for more than 400 analytes. Accordingly, the program has produced a large volume of water quality data. The following results presentation approach was applied to enable the presentation of a concise report that addresses the EPL requirements, while documenting the full suite of results:

- Certificates of Analysis (COA) for all sample results are provided in **Appendix E**.
- Analytes that were not detected (i.e. below the LOR) are not reported in results tables. **Table A1** in **Appendix A** lists each of the analytes tested and notes if all results for the given analyte were below detection limits.
- All detected analytes were compiled by Victory Engineering in water quality results tables that are provided in **Table A2** (General Characterisation Analytes) and **A3** (Potential Contamination Analytes). Both tables are provided in **Appendix A**. These tables compare all detected analytes to the adopted trigger levels and other relevant guideline levels. Commentary is provided for most analytes that exceed trigger values.
- Additional information and analysis is provided for analytes that were above trigger levels in Dam 2. Consolidated results tables are provided in **Section 5.2** and are discussed in **Section 5.3**.

5.2 Water Quality Results

As discussed in **Section 3**, Dams 1 and 2 capture and treat all surface water runoff from the facility’s 8.6 ha Water Management Area. The majority of captured water is used onsite for haul road, stockpile and conveyor dust suppression. All water used onsite is sourced from Dam 2. This substantially reduces the frequency and magnitude of site overflows. Uncontrolled overflows occur from Dam 2 when the dam water level reaches the invert level of the outflow pipe. Accordingly, the quality of water in Dam 2 during wet weather conditions is considered to be representative of the quality of water that overflows from site, during an overflow event. As a result, the Dam 2 water quality results were reviewed to identify analytes of concern.

Table 5-1 lists all water quality analytes tested and provides and overview of analytes that exceeded trigger values in Dam 2 on at least one occasion.

Table 5-1 *– Summary of Trigger Value Exceedances in Dam 2*

Analytes Tested	Analytes that Exceeded Trigger Values in Dam 2 (Analytes of Concern)
pH	pH
Suspended Solids	Suspended Solids
Turbidity	
Oil & Grease	
Conductivity	
Biological: Total Coliforms, Heterotrophic Colony, E Coli, Chlorophyll a	
Nutrients: Reactive Phosphorus, Total Phosphorous, Ammonia, Nitrate as N, Nitritee as N, Total Kjeldahl Nitrogen as N, Total Nitrogen	Total Phosphorous, Ammonia, Nitrate (Total NOx),Total Nitrogen
Dissolved metals: Al, As, Ba, Be, B, Cd, Cr, Co, Cu, Fe, Pb, Mn, Mo, Ni, Ag, Tl, Sn, Se, Sr U, V, Zn, Bi, Sb, Ga, La	Al, Ba, Cr(VI), Cu, Sr, Va
Major Cations (Ca, Mg, Na, K)	
Total Hardness as CaCO3	
Sulfate as SO4	
Chloride	
Oxygen Demand: Biological Oxygen Demand, Chemical Oxygen Demand	
Silica	
Fluoride	Fluoride
Total Organic Carbon	
Redox Potential	
Cyanide	Cyanide
TRH/BTEXN/PAH	
VOC Ultra trace screen (41 compounds including MAHs, THMs, Halogenated Aromatics, Naphthalene and MTBE)	
Phenolics and other Polar Compounds	2-Methylphenol, 3&4-methylphenol, 2,4-Dimethylphenol
Explosives - low level (incl. Nitrobenzenes & Nitrotoluenes)	
Chlorinated Naphthalenes	
SVOC - Chlorinated Hydrocarbons (incl. Hexachlorobutadiene, Hexachlorocyclopentadiene)	
Anilines and Benzidines	Aniline
Phthalate Esters & Other Plasticisers *(6 analytes)*	
OC *(22 analytes)* and **PCBs** *(7 PCBs)*, **OP** *(50 analytes including all OPs in the 2014 ADWG), plus 105* Triazine, Carbamates, Thiocarbamates, Conazoles and miscellaneous Pesticides - Ultra trace Level (184 analytes)	Carbendazim
Synthetic Pyrethroids *(14 analytes)*	
Phenols - *(12 analytes)*	
Anionic Surfactants as MBAS	Anionic Surfactants
Un-ionised Hydrogen Sulfide	
Chromium: Dissolved Trivalent Chromium, Dissolved Hexavalent Chromium	Hexavalent Chromium
Chlorine - Total Residual	Chlorine
Alcohol (Ethanol, isopropanol, n-propanol, isobutanol, n-butanol)	
Phthalate Esters	

Table 5-2 provides a detailed summary of water quality results for analytes of concern that are identified in **Table 5-1**, providing the following information for each analyte:

- A summary of the water quality of untreated runoff from the site into Dam 1 (Dam 1 inflows).
- Dam 2 results during dry weather sampling events (i.e. S1, S3 and S4).
- Dam 2 results during wet weather sampling events (i.e. S2, S5, S6, S7, S8 and S9). As discussed previously, the water quality in Dam 2 during wet weather conditions is considered to be representative of the quality of any water that overflows from the site.
- Results from Prospect Creek (sampled upstream of the site overflow location) are included as an alternative reference. The rationale for including this alternative reference is discussed further below.
- Information on typical quality of untreated urban stormwater runoff is also provided as an alternative reference. The rationale for including this alternative reference is discussed further below.

For each result item, **Table 5-2** notes the number of relevant samples and the minimum, average and maximum concentrations.

Alternative Water Quality References

The trigger values established in this report provide a conservative reference for water quality that is unlikely to cause environmental harm to a slightly-to-moderately disturbed watercourse. As some water quality analytes have exceeded trigger values, in some cases by more than an order of magnitude, alternative less conservative references can be used to understand the severity of the exceedance. This is of particular relevance when using trigger values to assess water quality impacts during significant wet weather events, such as some of the rainfall events that occurred over the sampling period. During significant runoff events, water quality is generally poorer than average in both natural and modified catchments.

Accordingly, information from the following alternative references is provided in **Table 5-2**:

- Water quality results from samples collected from Prospect Creek, upstream of the site overflow location.
- Information on the typical characteristics of untreated stormwater runoff that is documented in the following guidelines and research papers:
    - Australian Runoff Quality (IEAust, 2005).
    - Stormwater Flow and Quality and the Effectives of Non-Proprietary Stormwater Treatment Measures – A Review and Gap Analysis (Fletcher et all, 2004).

  Both of these guidelines have informed modern stormwater management practices and are commonly referenced in stormwater management studies and investigations. It is expected that the majority of runoff from developed portions of the Prospect Creek Catchment would have characteristics similar to the above-mentioned guideline values.

Table 5-2 – *Key Results Summary Table*

Analyte	Trigger Value	Units		Untreated Runoff (Dam 1 inflows)	Dam 2 (Dry Weather)	Dam 2 (Wet Weather)	Prospect Creek (Upstream of Site)	Typical Concentrations of Urban Stormwater[1]
pH	6.5 – 8.5		Samples	2	3	6	2	48[1]
			Min	**10.4**	7.5	8.1	7.6	-1 SD: 6.3[1]
			Avg	**10.5**	7.9	**9.8**	7.7	Mean: 6.9[1]
			Max	**10.7**	8.3	**10.4**	7.8	+1 SD 7.5[1]
Suspended Solids	50	(mg/l)	Samples	2	3	6	1	247[1]
			Min	**122**	48	5	8	-1 SD: 50[1]
			Avg	**219**	**105**	**52**	8	Mean: 150[1]
			Max	**315**	**202**	**147**	8	+1 SD: 400[1]
Total Phosphorous	25	(ug/l)	Samples	2	3	6	2	206[1]
			Min	22	13	8	20	-1 SD: 150[1]
			Avg	**61**	**78**	**46**	**84**	Mean: 320[1]
			Max	**100**	**200**	**143**	**147**	+1 SD: 840[1]
Ammonia	20	(ug/l)	Samples	2	3	6	2	17[2]
			Min	**114**	**130**	**31**	16	EMC ranges from 20 to 540[2]
			Avg	**182**	**332**	**176**	**29**	
			Max	**250**	**690**	**337**	**42**	
Nitrate (Total NOx)	40	(ug/l)	Samples	2	3	6	2	17[2]
			Min	**1,190**	**63**	**382**	**129**	EMC ranges from 150 to 510[2]
			Avg	**5,945**	**298**	**2,562**	**176**	
			Max	**10,700**	**530**	**6,100**	**222**	
Total Nitrogen	350	(ug/l)	Samples	2	3	6	2	139[1]
			Min	**4,300**	**1,300**	**1,160**	**740**	-1 SD: 1,400[1]
			Avg	**8,550**	**1,953**	**5,297**	**915**	Mean: 2,400[1]
			Max	**12,800**	**2,500**	**7,950**	**1,090**	+1 SD: 5,000[1]
Aluminium (Al)	55	(ug/l)	Samples	2	3	6	2	No Data Available
			Min	**2,380**	**120**	**172**	13	
			Avg	**2,495**	**132**	**1,556**	**108**	
			Max	**2,610**	**140**	**2,700**	**203**	
Barium (Ba)	8	(ug/l)	Samples	2	3	6	2	No Data Available
			Min	**10**	**11**	5	**49**	
			Avg	**14**	**13**	**10**	**51**	
			Max	**17**	**14**	**12**	**52**	
Chromium IV (Cr)	1	(ug/l)	Samples	2	3	6	1	65[1]
			Min	**32**	1	**5**	1	-1 SD: 5[1]
			Avg	**34**	**2**	**18**	1	Mean: 15[1]
			Max	**36**	**4**	**26**	1	+1 SD: 110[1]
Copper (Cu)	2.9	(ug/l)	Samples	2	3	6	2	140[1]
			Min	**24**	2	**8**	**6**	-1 SD: 18[1]
			Avg	**24**	**9**	**16**	**7**	Mean: 50[1]
			Max	**24**	**18**	**23**	**7**	+1 SD: 150[1]
Strontium (Sr)	150	(ug/l)	Samples	1	1	6	2	No Data Available
			Min	**176**	84	90	120	
			Avg	**176**	84	129	**165**	
			Max	**176**	84	**167**	**210**	
Vanadium (Va)	6	(ug/l)	Samples	2	2	6	2	No Data Available
			Min	**40**	**8**	**16**	1	
			Avg	**47**	**14**	**36**	2	
			Max	**53**	**20**	**45**	2	
Hexavalent Chromium	**1**	(ug/l)	Samples	1	No Samples	6	No Samples	No Data Available
			Min	**40**	-	**4**	-	
			Avg	**40**	-	**20**	-	
			Max	**40**	-	**31**	-	

Analyte	Trigger Value	Units		Untreated Runoff (Dam 1 inflows)	Dam 2 (Dry Weather)	Dam 2 (Wet Weather)	Prospect Creek (Upstream of Site)	Typical Concentrations of Urban Stormwater[1]
Fluoride	115	(ug/l)	Samples	1	2	3	No Samples	No Data Available
			Min	**200**	**587**	**200**	-	
			Avg	**200**	**595**	**267**	-	
			Max	**200**	**600**	**300**	-	
Cyanide	7	(ug/l)	Samples	No Samples	No Samples	4	No Samples	No Data Available
			Min	-	-	7	-	
			Avg	-	-	**8**	-	
			Max	-	-	**10**	-	
2-Methyphenol	13	(ug/l)	Samples	No Samples	1	No Samples	No Samples	No Data Available
			Min	-	**234**	-	-	
			Avg	-	**234**	-	-	
			Max	-	**234**	-	-	
3, 4-Methyphenol	35	(ug/l)	Samples	No Samples	1	No Samples	No Samples	No Data Available
			Min	-	**509**	-	-	
			Avg	-	**509**	-	-	
			Max	-	**509**	-	-	
2, 4-Dimethyphenol	2	(ug/l)	Samples	No Samples	1	No Samples	No Samples	No Data Available
			Min	-	**142**	-	-	
			Avg	-	**142**	-	-	
			Max	-	**142**	-	-	
Aniline	8	(ug/l)	Samples	No Samples	1	No Samples	No Samples	No Data Available
			Min	-	**28**	-	-	
			Avg	-	**28**	-	-	
			Max	-	**28**	-	-	
Carbendazim	0.5	(ug/l)	Samples	1	1	6	No Samples	No Data Available
			Min	**1.8**	0.2	0.2	-	
			Avg	**1.8**	0.2	**0.6**	-	
			Max	**1.8**	0.2	**1.1**	-	
Anionin Surfactants	50	(ug/l)	Samples	1	1	3	1	No Data Available
			Min	**200**	**100**	**100**	**100**	
			Avg	**200**	**100**	**267**	**100**	
			Max	**200**	**100**	**400**	**100**	
Chlorine	3	(ug/l)	Samples	1	No Samples	2	2	No Data Available
			Min	**30**	-	**20**	**20**	
			Avg	**30**	-	**25**	**35**	
			Max	**30**	-	**30**	**50**	

Bold denotes trigger value exceeded.

Note 1: value sourced from Chapter 3 (Urban Stormwater Pollutant Characteristics) of Australian Runoff Quality (IEAust, 2005). The mean and ± 1 Standard Deviation (SD) values for the "All urban" category are reported along with the number of samples used to inform the published values.

Note 2: value sourced from Table 2.25 from Fletcher et all (2004). The range in calculated Event Mean Concentrations (EMCs) is provided.

5.3 Results Discussion

The following conclusions can be made from the water quality data presented in **Table 5-2** and **Appendix A**:

- pH values in Dam 2 wet weather samples were measured to be between 8.1 to 10.4, consistently above the trigger value range of 6.5 to 8.5. Similar values were recorded in Dam 1 inflows. The pH during dry weather conditions was within the trigger value range for all samples. These results indicate that runoff from the site is moderately basic. As noted in **Section 3**, the acid dosing plant in Dam 2 was not operating over the monitoring period. This was done to avoid any potential interference with the water quality sampling program. Accordingly, the elevated pH levels in Dam 2 to not imply that the acid dosing plant is ineffective.

- Suspended solid concentrations in Dam 2 wet weather samples were measured to be between 5 and 147 mg/l, averaging 50 mg/l. These concentrations were substantially below the Dam 1 inflow concentrations which ranged from 122 to 315 mg/l. These results indicate that sedimentation is an effective treatment process during wet weather conditions, but suspended sediment concentrations are likely to exceed the 50 mg/l trigger value during some overflow events.

- Total Phosphorus concentrations in Dam 2 wet weather samples were measured to be between 8 and 143 ug/l, averaging 46 ug/l. Similar concentrations were measured in Dam 1 inflows indicating that Dams 1 and 2 do not provide material phosphorus removal. The Dam 2 wet weather concentrations were favourable when compared to the typical range in values in urban stormwater (150 to 840 ug/l).

- Total Nitrogen concentrations in Dam 2 wet weather samples were measured to be between 1,160 and 7,950 ug/l, averaging 5,297 ug/l. Higher concentrations were measured in Dam 1 inflows indicating that Dams 1 and 2 provide some material nitrogen removal. The measured concentrations are substantially above both the trigger value (350 ug/l) and the typical range in values in urban stormwater (1,400 to 5,000 ug/l) Monitoring results indicate that the majority of Nitrogen is in the oxidised NOx form.

- Dissolved metal concentrations of Aluminium, Chromium IV, Copper and Vanadium in Dam 2 wet weather samples were between 5 to 50 times higher than the relevant trigger values. Some measured concentrations of Barium and Strontium marginally exceed the relevant trigger values. For all of the above metals, concentrations were higher in the Dam 1 inflow samples, indicating that the sedimentation process provides material removal of metals.

- Hexavalent Chromium exceeded the trigger value of 1 ug/l in all samples. However, it is noted that all measured concentrations were below the Australian Drinking Water Guideline recommended concentration of 50 ug/l for potable water.

- Fluoride concentrations were highest in Dam 2 dry weather samples as well as the Dam 1 inflow (small) sample, which sampled water from the leaky mains pipe. This data indicates that the elevated fluoride concentrations are at least partially attributed to inflows from the leaky mains pipe.

- Some Cyanide concentrations in Dam 2 wet weather samples were marginally above the trigger values.

- Chlorine concentrations in Dam 2 wet weather samples were above the trigger value. However, chlorine readily breaks down and is not considered to be a key analyte of concern.

- Measured concentrations of 2 Methyphenol, 3-4 Methyphenol, 2-4 Dimethyphenol, Aniline, Anionin Surfacts and Carbendazim exceed the calculated trigger values. Refer to the commentary column in results **Table A3** in **Appendix A** for further information on these chemicals.

Potential Sources of Contamination

The extent and nature of contaminants detected are consistent with what could be reasonably expected from an operation processing building waste. As a result, the contaminants are generally unavoidable, and need to be managed by an appropriate surface water mitigation and monitoring system.

Impacts of Dredging

With reference to the results presented in **Appendix A**, post dredging samples generally returned higher concentrations of analytes of concern than pre dredging samples. In particular, Aluminium and Nitrogen concentrations were markedly higher. As the end of dredging period coincided with the commencement of the mid-February to March wet period, it is likely that the higher concentrations are associated with the higher runoff volumes rather than any temporary post dredging impacts. This is supported by the similarly high Aluminium and Nitrogen concentrations in sampling of untreated runoff (Dam 1 inflow location) during the wet period.

5.4 Potential Water Quality Impacts

The water quality results presented in **Table 5-2** indicate that concentrations of the listed analytes in Dam 2 during wet weather conditions could potentially exceed the associated trigger values. Similar exceedances are probable in any water that overflows from Dam 2 into Prospect Creek. When assessing potential impacts associated with site overflows, the frequency and magnitude of overflows need to be understood, as does the likely flow condition in Prospect Creek at the time of overflow.

As discussed in **Section 4.2**, a significant amount of rainfall occurred in late February and throughout March, with 426 mm of rainfall recorded between 26 February 2017 to the end of March 2017. This substantial rainfall resulted in uncontrolled overflows occurring from Dam 2 on the 2nd and 3rd of March and again on the 18th of March. The 5 day rainfall total during both overflow events was in excess of 100mm, comfortably above the 45mm five day rainfall total that is specified as the permissible discharge threshold in both the EPL (Condition L1.2) and Consent Conditions (no.25). This information indicates that site overflows are only likely to occur during significant wet weather periods, when substantial flows in Prospect Creek would be occurring. For context, Boral provided a photograph of Prospect Creek (adjacent to the site) that was taken on 2 March 2017, during an uncontrolled overflow event. This photograph is provided below as **Photo 1**. The photograph clearly shows that stream flow in Prospect Creek is close to bank full.

Photo 1 – *Streamflow in Prospect Creek on 2 March 2017*

As noted in **Section 3**, the facility's 8.6 ha Water Management Area is equivalent to only 0.8% of the contributing Prospect Creek Catchment area at the facility's overflow location. By virtue of dilution, it is expected that any overflows from the facility will not materially alter the water quality in Prospect Creek during wet weather. However, it is acknowledged that overflows from the site are likely to contribute to the cumulative degradation of water quality in Prospect Creek during wet weather conditions.

Potential for impacts to Prospect Creek water quality would increase if Dam 2 water is discharged outside of a significant wet weather period (i.e. via controlled discharges). Controlled discharges are currently not permitted by EPL (Condition U1) and no controlled discharges occurred over the monitoring period.

The SWMMP will be informed by a water balance model that will be calibrated using water level and site water use data that has been collected by Boral in February and March 2017. The calibrated water balance model will be applied to estimate overflow frequencies and volumes and the ability of the facility's water management system to comply with EPL and Consent Conditions with or without the need for controlled discharge. The SWMMP will also propose mitigation and monitoring measures. These measures will be informed by the water quality data that is presented in this SWCA.

6 REFERENCES

1) Australian and New Zealand Environment Consultation Council (2000), *'Australian and New Zealand Guidelines for Fresh and Marine Water Quality'*

2) Fletcher et all. (2005), *'Stormwater Flow and Quality, and the Effectiveness of Non-Proprietary Stormwater Treatment Measures – A Review and Gap Analysis'*

3) Institution of Engineers Australia (2005), *'Australian Runoff Quality'*

APPENDIX A

Detailed Detected Analytes Collation and Commentary

Note: "ECL" refers to an "Environmental Concern Level", as per section 8.3.4.5 of the ANZECC (2000) Guidelines.

Table A1 – Collation of Trigger Value Developments for All Analytes

Analyte grouping/Analyte	Analytes Detected (>LOR)? (Y/N)	Trigger Value Proposed? (Y/N)	Trigger Value Source, OR Reason for No Trigger Value Proposed
pH Value	Y	Y	EPL range.
Electrical Conductivity @ 25°C	Y	Y	Consultant judgement.
Total Suspended Solids (TSS)	Y	Y	EPL limit.
Turbidity	Y	N	EPL references TSS.
Redox Potential	Y	N	Not an ANZECC 2000 analyte.
Sulfate as SO4	Y	N	Not an ANZECC 2000 analyte.
Chloride	Y	N	Not an ANZECC 2000 analyte.
Calcium	Y	N	Not an ANZECC 2000 analyte.
Magnesium	Y	N	Not an ANZECC 2000 analyte.
Sodium	Y	N	Not an ANZECC 2000 analyte.
Potassium	Y	N	Not an ANZECC 2000 analyte.
Gallium	Y	Y	ANZECC 2000 low-reliability trigger.
Lanthanum	N	N	Not detected in Dam 2.
Mercury	N	N	Not detected in Dam 2.
Hexavalent Chromium	Y	Y	ANZECC 2000, Table 3.4.1.
Dissolved Metals			
Aluminium	Y	Y	ANZECC 2000, Table 3.4.1.
Antimony	Y	Y	ANZECC 2000 low-reliability trigger.
Arsenic	Y	Y	ANZECC 2000, Table 3.4.1, for As(V).
Barium	Y	Y	An ECL is proposed.
Beryllium	N	N	Not detected in Dam 2.
Bismuth	N	N	Not detected in Dam 2.
Boron	N	N	Not detected in Dam 2.
Cadmium	N	N	Not detected in Dam 2.
Chromium	Y	Y	ANZECC 2000, Table 3.4.1, hardness-modified.
Cobalt	Y	Y	ANZECC 2000 low-reliability trigger.
Copper	Y	Y	ANZECC 2000, Table 3.4.1, hardness-modified.
Iron	Y	Y	ANZECC 2000 interim figure, via the Canadian Guidelines.
Lead	Y	Y	ANZECC 2000, Table 3.4.1, hardness-modified.
Manganese	Y	Y	ANZECC 2000, Table 3.4.1, moderate reliability.
Molybdenum	Y	Y	ANZECC 2000 low-reliability trigger.
Nickel	Y	Y	ANZECC 2000, Table 3.4.1, hardness-modified.
Selenium	N	N	Not detected in Dam 2.
Silver	N	N	Not detected in Dam 2.
Strontium	Y	Y	An ECL is proposed.
Thallium	N	N	Not detected in Dam 2.
Tin	N	N	Not detected in Dam 2.
Uranium	Y	Y	ANZECC 2000 low-reliability trigger.
Vanadium	Y	Y	ANZECC 2000 low-reliability trigger.
Zinc	Y	Y	ANZECC 2000, Table 3.4.1, hardness-modified.

Analyte grouping/Analyte	Analytes Detected (>LOR)? (Y/N)	Trigger Value Proposed? (Y/N)	Trigger Value Source, OR Reason for No Trigger Value Proposed
Total Residual Chlorine	Y	Y	ANZECC 2000, Table 3.4.1.
Free Cyanide	N	N	Not detected in Dam 2.
Total Cyanide	Y	Y	ANZECC 2000, Table 3.4.1.
Weak Acid Dissociable Cyanide	N	N	Not detected in Dam 2.
Unionized Hydrogen Sulfide	N	N	Not detected in Dam 2.
Ammonia as N	Y	Y	ANZECC 2000, Table 3.3.2, footnote (d).
Nitrite as N	Y	N	Not an ANZECC 2000 analyte.
Nitrite + Nitrate as N	Y	Y	ANZECC 2000, Table 3.3.2, footnote (d).
Total Nitrogen as N	Y	Y	ANZECC 2000, Table 3.3.2, footnote (d).
Total Phosphorus as P	Y	Y	ANZECC 2000, Table 3.3.2, footnote (d).
Oil & Grease	Y	Y	EPL limit.
Chemical Oxygen Demand - Filtered	Y	N	Not an ANZECC 2000 analyte.
Biochemical Oxygen Demand (Filtered)	Y	N	Not an ANZECC 2000 analyte.
Anionic Surfactants as MBAS	Y	Y	Consultant judgement.
Phenolic Compounds			
Phenol	Y	Y	ANZECC 2000, Table 3.4.1.
2-Chlorophenol	N	N	Not detected in Dam 2.
2-Methylphenol	Y	Y	An ECL is proposed.
3- & 4-Methylphenol	Y	Y	An ECL is proposed.
2-Nitrophenol	N	N	Not detected in Dam 2.
2.4-Dimethylphenol	Y	Y	ANZECC 2000 low-reliability trigger.
2.4-Dichlorophenol	N	N	Not detected in Dam 2.
2.6-Dichlorophenol	N	N	Not detected in Dam 2.
4-Chloro-3-methylphenol	Y	Y	An ECL is proposed.
2.4.6-Trichlorophenol	N	N	Not detected in Dam 2.
2.4.5-Trichlorophenol	N	N	Not detected in Dam 2.
Pentachlorophenol	Y	Y	ANZECC 2000, Table 3.4.1.
Polynuclear Aromatic Hydrocarbons			
Naphthalene	Y	Y	ANZECC 2000, Table 3.4.1.
Acenaphthylene	N	N	Not detected in Dam 2.
Acenaphthene	N	N	Not detected in Dam 2.
Fluorene	N	N	Not detected in Dam 2.
Phenanthrene	N	N	Not detected in Dam 2.
Anthracene	N	N	Not detected in Dam 2.
Fluoranthene	N	N	Not detected in Dam 2.
Pyrene	N	N	Not detected in Dam 2.
Benz(a)anthracene	N	N	Not detected in Dam 2.
Chrysene	N	N	Not detected in Dam 2.
Benzo(b+j)fluoranthene	N	N	Not detected in Dam 2.
Benzo(k)fluoranthene	N	N	Not detected in Dam 2.
Benzo(a)pyrene	N	N	Not detected in Dam 2.
Indeno(1.2.3.cd)pyrene	N	N	Not detected in Dam 2.
Dibenz(a.h)anthracene	N	N	Not detected in Dam 2.
Benzo(g.h.i)perylene	N	N	Not detected in Dam 2.
Phthalate Esters			

Analyte grouping/Analyte	Analytes Detected (>LOR)? (Y/N)	Trigger Value Proposed? (Y/N)	Trigger Value Source, OR Reason for No Trigger Value Proposed
Dimethyl phthalate	N	N	Not detected in Dam 2.
Diethyl phthalate	N	N	Not detected in Dam 2.
Di-n-butyl phthalate	N	N	Not detected in Dam 2.
Butyl benzyl phthalate	N	N	Not detected in Dam 2.
bis(2-ethylhexyl) phthalate	N	N	Not detected in Dam 2.
Di-n-octylphthalate	N	N	Not detected in Dam 2.
Chlorifluonated Hydrocarbons			
1.4-Dichlorobenzene	N	N	Not detected in Dam 2.
1.3-Dichlorobenzene	N	N	Not detected in Dam 2.
1.2-Dichlorobenzene	N	N	Not detected in Dam 2.
Hexachloroethane	N	N	Not detected in Dam 2.
1.2.4-Trichlorobenzene	N	N	Not detected in Dam 2.
Hexachloropropylene	N	N	Not detected in Dam 2.
Hexachlorobutadiene	N	N	Not detected in Dam 2.
Hexachlorocyclopentadiene	N	N	Not detected in Dam 2.
Pentachlorobenzene	N	N	Not detected in Dam 2.
Hexachlorobenzene (HCB)	N	N	Not detected in Dam 2.
Anilines and Benzidines			
Aniline	Y	Y	ANZECC 2000, Table 3.4.1.
4-Chloroaniline	N	N	Not detected in Dam 2.
2-Nitroaniline	N	N	Not detected in Dam 2.
3-Nitroaniline	N	N	Not detected in Dam 2.
Dibenzofuran	N	N	Not detected in Dam 2.
4-Nitroaniline	N	N	Not detected in Dam 2.
Carbazole	N	N	Not detected in Dam 2.
3.3`-Dichlorobenzidine	N	N	Not detected in Dam 2.
Total Petroleum Hydrocarbons			
C6 - C9 Fraction	Y	N	Not an ANZECC 2000 analyte; indicative only.
C10 - C14 Fraction	Y	N	Not an ANZECC 2000 analyte; indicative only.
C15 - C28 Fraction	Y	N	Not an ANZECC 2000 analyte; indicative only.
C29 - C36 Fraction	N	N	Not detected in Dam 2.
Total Recoverable Hydrocarbons - NEPM 2013 Fractions			
C6 - C10 Fraction	Y	N	Not an ANZECC 2000 analyte; indicative only.
>C10 - C16 Fraction	N	N	Not detected in Dam 2.
>C16 - C34 Fraction	Y	N	Not an ANZECC 2000 analyte; indicative only.
>C34 - C40 Fraction	N	N	Not detected in Dam 2.
BTEXN			
Benzene	N	N	Not detected in Dam 2.
Toluene	Y	Y	ANZECC 2000 low-reliability trigger.
Ethylbenzene	Y	Y	ANZECC 2000 low-reliability trigger.
meta- & para-Xylene	Y	Y	ANZECC 2000, Table 3.4.1.
ortho-Xylene	Y	Y	ANZECC 2000, Table 3.4.1.
Naphthalene	Y	Y	ANZECC 2000, Table 3.4.1.

Analyte grouping/Analyte	Analytes Detected (>LOR)? (Y/N)	Trigger Value Proposed? (Y/N)	Trigger Value Source, OR Reason for No Trigger Value Proposed
Synthetic Pyrethroids			
Bioresmethrin	N	N	Not detected in Dam 2.
Bifenthrin	N	N	Not detected in Dam 2.
Phenothrin	N	N	Not detected in Dam 2.
Lambda-cyhalothrin	N	N	Not detected in Dam 2.
Permethrin	N	N	Not detected in Dam 2.
Cyfluthrin	N	N	Not detected in Dam 2.
Cypermethrin	N	N	Not detected in Dam 2.
Fenvalverate & Esfenvalerate	N	N	Not detected in Dam 2.
Deltamethrin & Tralomethrin	N	N	Not detected in Dam 2.
Allethrin	N	N	Not detected in Dam 2.
Transfluthrin	N	N	Not detected in Dam 2.
Tau-fluvalinate	N	N	Not detected in Dam 2.
Tetramethrin	N	N	Not detected in Dam 2.
Synergist			
Piperonyl Butoxide	N	N	Not detected in Dam 2.
Alcohols			
Ethanol	Y	Y	ANZECC 2000, Table 3.4.1.
Isopropanol	Y	Y	ANZECC 2000, Table 3.4.1.
n-Propanol	N	N	Not detected in Dam 2.
Isobutanol	N	N	Not detected in Dam 2.
n-Butanol	N	N	Not detected in Dam 2.
Monocyclic Aromatic Hydrocarbons			
Benzene	N	N	Not detected in Dam 2.
Toluene	Y	Y	ANZECC 2000 low-reliability trigger.
Ethylbenzene	Y	Y	ANZECC 2000 low-reliability trigger.
meta- & para-Xylene	Y	Y	ANZECC 2000, Table 3.4.1.
Styrene	Y	Y	An ECL is proposed.
ortho-Xylene	Y	Y	ANZECC 2000, Table 3.4.1.
1.3.5-Trimethylbenzene	N	N	Not detected in Dam 2.
1.2.4-Trimethylbenzene	Y	N	Not detected in Dam 2.
Fumigants			
1.2-Dichloropropane	N	N	Not detected in Dam 2.
cis-1.3-Dichloropropylene	N	N	Not detected in Dam 2.
trans-1.3-Dichloropropylene	N	N	Not detected in Dam 2.
1.2-Dibromoethane (EDB)	N	N	Not detected in Dam 2.
Halogenated Aliphatic Compounds			
Dichlorodifluoromethane	N	N	Not detected in Dam 2.
Vinyl chloride	N	N	Not detected in Dam 2.
Bromomethane	N	N	Not detected in Dam 2.
Chloroethane	N	N	Not detected in Dam 2.
Trichlorofluoromethane	N	N	Not detected in Dam 2.
1.1-Dichloroethene	N	N	Not detected in Dam 2.
Dichloromethane	Y	Y	ANZECC 2000, low-reliability trigger.
trans-1.2-Dichloroethene	N	N	Not detected in Dam 2.
1.1-Dichloroethane	N	N	Not detected in Dam 2.
cis-1.2-Dichloroethene	N	N	Not detected in Dam 2.
Bromochloromethane	N	N	Not detected in Dam 2.
1.2-Dichloroethane	Y	Y	ANZECC 2000, low-reliability trigger.

Analyte grouping/Analyte	Analytes Detected (>LOR)? (Y/N)	Trigger Value Proposed? (Y/N)	Trigger Value Source, OR Reason for No Trigger Value Proposed
1.1.1-Trichloroethane	N	N	Not detected in Dam 2.
Carbon Tetrachloride	N	N	Not detected in Dam 2.
Trichloroethene	Y	Y	ANZECC 2000, low-reliability trigger.
Tetrachloroethene	N	N	Not detected in Dam 2.
Hexachlorobutadiene	N	N	Not detected in Dam 2.
Halogenated Aromatic Compounds			
Chlorobenzene	Y	Y	ANZECC 2000, low-reliability trigger.
Bromobenzene	N	N	Not detected in Dam 2.
Benzylchloride	N	N	Not detected in Dam 2.
1.3-Dichlorobenzene	N	N	Not detected in Dam 2.
1.4-Dichlorobenzene	N	N	Not detected in Dam 2.
1.2-Dichlorobenzene	N	N	Not detected in Dam 2.
2-Chlorotoluene	N	N	Not detected in Dam 2.
4-Chlorotoluene	N	N	Not detected in Dam 2.
1.2.4-Trichlorobenzene	N	N	Not detected in Dam 2.
1.2.3-Trichlorobenzene	N	N	Not detected in Dam 2.
Trihalomethanes			
Chloroform	Y	Y	ANZECC 2000, low-reliability trigger.
Bromodichloromethane	Y	Y	An ECL is proposed.
Dibromochloromethane	Y	Y	An ECL is proposed.
Bromoform	N	N	Not detected in Dam 2.
Methyl tert-butyl ether (MTBE)	N	N	Not detected in Dam 2.
Organochlorine Pesticides			
Aldrin	N	N	Not detected in Dam 2.
alpha-BHC	N	N	Not detected in Dam 2.
beta-BHC	N	N	Not detected in Dam 2.
delta-BHC	N	N	Not detected in Dam 2.
4.4`-DDD	N	N	Not detected in Dam 2.
4.4`-DDE	N	N	Not detected in Dam 2.
4.4`-DDT	N	N	Not detected in Dam 2.
Dieldrin	N	N	Not detected in Dam 2.
alpha-Endosulfan	N	N	Not detected in Dam 2.
beta-Endosulfan	N	N	Not detected in Dam 2.
Endosulfan sulfate	N	N	Not detected in Dam 2.
Endrin	N	N	Not detected in Dam 2.
Endosulfan (sum)	N	N	Not detected in Dam 2.
Endrin aldehyde	N	N	Not detected in Dam 2.
Endrin ketone	N	N	Not detected in Dam 2.
Heptachlor	N	N	Not detected in Dam 2.
Heptachlor epoxide	N	N	Not detected in Dam 2.
Hexachlorobenzene (HCB)	N	N	Not detected in Dam 2.
gamma-BHC	N	N	Not detected in Dam 2.
Methoxychlor	N	N	Not detected in Dam 2.
cis-Chlordane	N	N	Not detected in Dam 2.
trans-Chlordane	N	N	Not detected in Dam 2.
Polychlorinated Biphenyls (as Aroclors)			

Analyte grouping/Analyte	Analytes Detected (>LOR)? (Y/N)	Trigger Value Proposed? (Y/N)	Trigger Value Source, OR Reason for No Trigger Value Proposed
Total Polychlorinated biphenyls	N	N	Not detected in Dam 2.
Chlorinated Naphthalenes			
2-Chloronaphthalene	N	N	Not detected in Dam 2.
Explosives			
HMX	N	N	Not detected in Dam 2.
RDX	N	N	Not detected in Dam 2.
1.3.5-Trinitrobenzene	N	N	Not detected in Dam 2.
1.3-Dinitrobenzene	N	N	Not detected in Dam 2.
Tetryl	N	N	Not detected in Dam 2.
2.4.6-TNT	N	N	Not detected in Dam 2.
4-Amino.2.6-DNT	N	N	Not detected in Dam 2.
2-Amino-4.6-DNT	N	N	Not detected in Dam 2.
2.4-Dinitrotoluene	N	N	Not detected in Dam 2.
2.6-Dinitrotoluene	N	N	Not detected in Dam 2.
Nitrobenzene	Y	Y	ANZECC 2000, Table 3.4.1.
2-Nitrotoluene	N	N	Not detected in Dam 2.
3-Nitrotoluene	N	N	Not detected in Dam 2.
4-Nitrotoluene	N	N	Not detected in Dam 2.
Nitroglycerine	N	N	Not detected in Dam 2.
PETN	N	N	Not detected in Dam 2.
OP Pesticides			
Acephate	N	N	Not detected in Dam 2.
Azinphos-methyl	N	N	Not detected in Dam 2.
Azinphos-ethyl	N	N	Not detected in Dam 2.
Bensulide	N	N	Not detected in Dam 2.
Bromophos-ethyl	N	N	Not detected in Dam 2.
Carbofenothion	N	N	Not detected in Dam 2.
Chlorfenvinphos	N	N	Not detected in Dam 2.
Chlorpyrifos	N	N	Not detected in Dam 2.
Chlorpyrifos-methyl	N	N	Not detected in Dam 2.
Coumaphos	N	N	Not detected in Dam 2.
Demeton-O	N	N	Not detected in Dam 2.
Demeton-O & Demeton-S	N	N	Not detected in Dam 2.
Demeton-S	N	N	Not detected in Dam 2.
Demeton-S-methyl	N	N	Not detected in Dam 2.
Diazinon	Y	Y	ANZECC 2000, Table 3.4.1.
Dichlorvos	N	N	Not detected in Dam 2.
Dimethoate	N	N	Not detected in Dam 2.
Disulfoton	N	N	Not detected in Dam 2.
EPN	N	N	Not detected in Dam 2.
Ethion	N	N	Not detected in Dam 2.
Ethoprophos	N	N	Not detected in Dam 2.
Fenamiphos	N	N	Not detected in Dam 2.
Fenchlorphos (Ronnel)	N	N	Not detected in Dam 2.
Fenitrothion	N	N	Not detected in Dam 2.
Fensulfothion	N	N	Not detected in Dam 2.
Fenthion	N	N	Not detected in Dam 2.
Formothion	N	N	Not detected in Dam 2.

Analyte grouping/Analyte	Analytes Detected (>LOR)? (Y/N)	Trigger Value Proposed? (Y/N)	Trigger Value Source, OR Reason for No Trigger Value Proposed
Fosetyl Aluminium	N	N	Not detected in Dam 2.
Malathion	N	N	Not detected in Dam 2.
Methidathion	N	N	Not detected in Dam 2.
Mevinphos	N	N	Not detected in Dam 2.
Monocrotophos	N	N	Not detected in Dam 2.
Naftalofos	N	N	Not detected in Dam 2.
Omethoate	N	N	Not detected in Dam 2.
Parathion	N	N	Not detected in Dam 2.
Parathion-methyl	N	N	Not detected in Dam 2.
Phorate	N	N	Not detected in Dam 2.
Pirimiphos-ethyl	N	N	Not detected in Dam 2.
Pirimiphos-methyl	N	N	Not detected in Dam 2.
Profenofos	N	N	Not detected in Dam 2.
Prothiofos	N	N	Not detected in Dam 2.
Pyrazophos	N	N	Not detected in Dam 2.
Sulfotep	N	N	Not detected in Dam 2.
Sulprofos	N	N	Not detected in Dam 2.
Temephos	N	N	Not detected in Dam 2.
Terbufos	N	N	Not detected in Dam 2.
Tetrachlorvinphos	N	N	Not detected in Dam 2.
Thiometon	N	N	Not detected in Dam 2.
Triazophos	N	N	Not detected in Dam 2.
Trichlorfon	N	N	Not detected in Dam 2.
Trichloronate	N	N	Not detected in Dam 2.
Thiocarbamates and Carbamates			
Aldicarb	N	N	Not detected in Dam 2.
Bendiocarb	N	N	Not detected in Dam 2.
Benomyl	Y	Y	An ECL is proposed.
Carbaryl	N	N	Not detected in Dam 2.
Carbofuran	N	N	Not detected in Dam 2.
3-Hydroxy Carbofuran	N	N	Not detected in Dam 2.
EPTC	N	N	Not detected in Dam 2.
Fenoxycarb	N	N	Not detected in Dam 2.
Methiocarb	N	N	Not detected in Dam 2.
Methomyl	N	N	Not detected in Dam 2.
Molinate	N	N	Not detected in Dam 2.
Oxamyl	N	N	Not detected in Dam 2.
Pebulate	N	N	Not detected in Dam 2.
Pirimicarb	N	N	Not detected in Dam 2.
Promecarb	N	N	Not detected in Dam 2.
Propamocarb	N	N	Not detected in Dam 2.
Thiobencarb	N	N	Not detected in Dam 2.
Thiodicarb	N	N	Not detected in Dam 2.
Vernolate	N	N	Not detected in Dam 2.
Dinitroanilines			
Nitralin	N	N	Not detected in Dam 2.
Pendimethalin	N	N	Not detected in Dam 2.
Trifluralin	N	N	Not detected in Dam 2.
Triazinone Herbicides			
Hexazinone	N	N	Not detected in Dam 2.
Metribuzin	N	N	Not detected in Dam 2.
Conazole and Aminopyrimidine Fungicides			
Cyproconazole	N	N	Not detected in Dam 2.
Difenoconazole	N	N	Not detected in Dam 2.
Flusilazole	N	N	Not detected in Dam 2.
Hexaconazole	N	N	Not detected in Dam 2.
Paclobutrazole	N	N	Not detected in Dam 2.
Myclobutanil	N	N	Not detected in Dam 2.

Analyte grouping/Analyte	Analytes Detected (>LOR)? (Y/N)	Trigger Value Proposed? (Y/N)	Trigger Value Source, OR Reason for No Trigger Value Proposed
Penconazole	N	N	Not detected in Dam 2.
Propiconazole	N	N	Not detected in Dam 2.
Tebuconazole	N	N	Not detected in Dam 2.
Cyprodinil	N	N	Not detected in Dam 2.
Pyrimethanil	N	N	Not detected in Dam 2.
Pyroxsulam	N	N	Not detected in Dam 2.
Tetraconazole	N	N	Not detected in Dam 2.
Triadimefon	N	N	Not detected in Dam 2.
Triadimenol	N	N	Not detected in Dam 2.
Phenylurea			
Bensulfuron methyl	N	N	Not detected in Dam 2.
Diuron	N	N	Not detected in Dam 2.
Fluometuron	N	N	Not detected in Dam 2.
Chloroxuron	N	N	Not detected in Dam 2.
Tebuthiuron	Y	Y	ANZECC 2000, Table 3.4.1.
Bromacil	Y	Y	ANZECC 2000, low-reliability trigger.
Chlorsulfuron	N	N	Not detected in Dam 2.
Diflubenzuron	N	N	Not detected in Dam 2.
Iodosulfuron methyl	N	N	Not detected in Dam 2.
Isoproturon	N	N	Not detected in Dam 2.
Novaluron	N	N	Not detected in Dam 2.
Rimsulfuron	N	N	Not detected in Dam 2.
Siduron	N	N	Not detected in Dam 2.
Terbacil	N	N	Not detected in Dam 2.
Trifloxysulfuron-sodium	N	N	Not detected in Dam 2.
Chloracetanilides			
Alachlor	N	N	Not detected in Dam 2.
Metolachlor	Y	Y	An ECL is proposed.
Butachlor	N	N	Not detected in Dam 2.
Propachlor	N	N	Not detected in Dam 2.
Triazine Herbicides			
Ametryn	N	N	Not detected in Dam 2.
Atrazine	Y	Y	ANZECC 2000, Table 3.4.1.
Atrazine-desethyl	N	N	Not detected in Dam 2.
Atrazine-desisopropyl	N	N	Not detected in Dam 2.
Cyanazine	N	N	Not detected in Dam 2.
Cyromazine	Y	Y	ANZECC 2000, Table 3.4.1.
Prometryn	N	N	Not detected in Dam 2.
Propazine	N	N	Not detected in Dam 2.
Simazine	Y	Y	ANZECC 2000, Table 3.4.1.
Terbuthylazine	N	N	Not detected in Dam 2.
Terbutryn	N	N	Not detected in Dam 2.
Miscellaneous (ESI Positive Mode) Pesticides			
Abamectin	N	N	Not detected in Dam 2.
Aminopyralid	N	N	Not detected in Dam 2.
Amitraz	N	N	Not detected in Dam 2.
Azoxystrobin	N	N	Not detected in Dam 2.
Boscalid	N	N	Not detected in Dam 2.
Carbendazim (Thiophanate methyl)	N	N	Not detected in Dam 2.
Carboxin	N	N	Not detected in Dam 2.
Carfentrazone-ethyl	N	N	Not detected in Dam 2.
Chlorantraniliprole	N	N	Not detected in Dam 2.
Dichlobenil	N	N	Not detected in Dam 2.
Diclofop-methyl	N	N	Not detected in Dam 2.
Diphenamid	N	N	Not detected in Dam 2.
Etridiazole	N	N	Not detected in Dam 2.
Fenarimol	N	N	Not detected in Dam 2.

Analyte grouping/Analyte	Analytes Detected (>LOR)? (Y/N)	Trigger Value Proposed? (Y/N)	Trigger Value Source, OR Reason for No Trigger Value Proposed
Flamprop methyl	N	N	Not detected in Dam 2.
Haloxyfop	N	N	Not detected in Dam 2.
Imazapyr	N	N	Not detected in Dam 2.
Indoxacarb	N	N	Not detected in Dam 2.
Irgarol	Y	Y	An ECL is proposed.
Metalaxyl	N	N	Not detected in Dam 2.
Metalaxyl-M	N	N	Not detected in Dam 2.
Metaldehyde	N	N	Not detected in Dam 2.
Napropamide	N	N	Not detected in Dam 2.
Norflurazon	N	N	Not detected in Dam 2.
Oxyfluorfen	N	N	Not detected in Dam 2.
Prochloraz	N	N	Not detected in Dam 2.
Propargite	N	N	Not detected in Dam 2.
Propyzamide	N	N	Not detected in Dam 2.
Pyraclostrobin	N	N	Not detected in Dam 2.
Quinclorac	N	N	Not detected in Dam 2.
Spirotetramat	N	N	Not detected in Dam 2.
Thiamethoxam	Y	Y	An ECL is proposed.
Toltrazuril	N	N	Not detected in Dam 2.
Trifloxystrobin	N	N	Not detected in Dam 2.
Trinexapac Ethyl	N	N	Not detected in Dam 2.
Phenolics and Related Compounds			
2,4-Dinitrophenol	Y	Y	ANZECC 2000, Table 3.4.1.
2-Methyl-4.6-dinitrophenol	N	N	Not detected in Dam 2.
4-Nonylphenol (mixture of isomers)	Y	Y	An ECL is proposed.
Hexachlorophene	N	N	Not detected in Dam 2.
4-Nitrophenol	Y	Y	ANZECC 2000, low-reliability trigger.
Dinoseb	N	N	Not detected in Dam 2.
Dalapon	Y	Y	An ECL is proposed.
Bisphenol-A	Y	Y	An ECL is proposed.
Phthalate Esters			
Dimethyl phthalate	N	N	Not detected in Dam 2.
Diethyl phthalate	N	N	Not detected in Dam 2.
Di-n-butyl phthalate	N	N	Not detected in Dam 2.
Butyl benzyl phthalate	N	N	Not detected in Dam 2.
Bis(2-ethylhexyl) phthalate	N	N	Not detected in Dam 2.
Di-n-octylphthalate	N	N	Not detected in Dam 2.
Other Miscellaneous (added later in the project)			
Fluoride	Y	Y	An ECL is proposed.
Biological Oxygen Demand	Y	N	Not an ANZECC 2000 analyte.
Chemical Oxygen Demand	Y	N	Not an ANZECC 2000 analyte.
Silica – Reactive	Y	N	Not an ANZECC 2000 analyte.
Reactive Phosphorous	Y	Y	ANZECC 2000, Table 3.3.2.
Chlorophyll a	N	N	Not detected in Dam 2.
Total Organic Carbon	Y	N	Not an ANZECC 2000 analyte.
E. Coli	Y	N	Not an ANZECC 2000 analyte.
Heterotrophic Colony Count	Y	N	Not an ANZECC 2000 analyte.
Total Coliforms	Y	N	Not an ANZECC 2000 analyte.

Table A2 – General Characterisation Analytes

Notes:

- The proposed trigger is the default EPL limit, or the ANZECC (2000) Guideline default trigger for a slightly-moderately disturbed system with 95% protection, unless otherwise specified.
- References to Tables and Sections refer to the ANZECC (2000) Guidelines, unless otherwise specified.
- Bolded figures indicate an exceedance of the relevant proposed trigger point.
- “Prospect Creek U/S” refers to Prospect Creek, upstream of the site licenced discharge point.

Basic Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Proposed Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
pH (pH unit)	Dam 1 Inflow (small)	17/2/17	7.24	0.01	6.5-8.5 (EPL)	6.5-8.5 (EPL)	5.0-9.0	5.0-9.0 6.5-8.5 (SWRU Level 2)	pH limits as per the EPL. 5.0-9.0 if buffering at pH limit extremes is low. Table 3.3.2 has Lowland River limits at 6.5-8.0.
	Dam 1 Inflow	20/1/17 1/3/17	**10.68 (EMM)** **10.4**						
	Dam 1 (During Dredging)	8/2/17	**10.2**						
	Dam 1 (Before Dredging)	1/2/17	8.37						
	Dam 2	14/12/16 16/12/16 20/1/17 17/2/17 1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	7.91 8.14 8.33 (EMM) 7.52 (EMM) **9.34** **10.2** **10.3** **10.4** **10.3**						
	Prospect Creek U/S	16/12/16 17/3/17	7.64 7.82						
Electrical Conductivity @ 25 degrees C (EC, uS/cm)	Dam 1 Inflow (small)	17/2/17 17/2/17	495 (EMM) 489 (ALS)	1		(125-2,200) 800			Table 3.3.3 has a "Salinity" range (in EC units) of 125-2,200 uS/cm; NSW coastal rivers are typically in the range of 200-300 uS/cm, but this is unlikely to apply to Prospect Creek; up to 350 uS/com for NSW upland rivers. Table 5.2.3 for Recreational Uses has a limit of 1,000,000 ug/L Total Dissolved Solids. The average EC in Dam 2 was 440 uS/cm, which is at the lower-end of the ANZECC 2000 range. An arbitrary, interim figure of 800 uS/cm is proposed, to trigger further analysis of the root cause, but we reserve the right to revisit this figure. It is suspected that if the 800 uS/cm figure is reached, other contaminants may be of greater concern. Given that the site's activities unavoidably affect surface water
	Dam 1 Inflow	20/1/17 1/3/17	1,030 700						
	Dam 1 (During Dredging)	8/2/17	486						
	Dam 1 (Before Dredging)	1/2/17	377						
	Dam 2	14/12/16 16/12/16 20/1/17 20/1/17	306 333 566 (EMM) 491 (ALS)						

Basic Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Proposed Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
		17/2/17 17/2/17 1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	383 (EMM) 384 (ALS) 394 334 600 512 540						quality, the proposed EC trigger is truly best used as a broad, useful monitoring and management indicator. This will be discussed further in the Surface Water Mitigation and Monitoring Plan.
	Prospect Creek U/S	16/12/16 17/3/17	653 524						
Total Dissolved Solids (TDS, mg/L)	Dam 1 Inflow (small)	17/2/17 17/2/17	325 (EMM, calc) 330 (ALS)	10					TDS is often calculated as an estimate based on Electrical Conductivity (EC). TDS does not appear to be an ANZECC (2000) Guideline analyte.
	Dam 1 Inflow	20/1/17	570						
	Dam 2	20/1/17 17/2/17 17/2/17	346 249 (EMM, calc) 337 (ALS)						
Total Suspended Solids (TSS, mg/L)	Dam 1 Inflow (small)	17/2/17	22	5	50 (EPL)	50 (EPL)			TSS limits as per the EPL.
	Dam 1 Inflow	20/1/17 1/3/17	**315** **122**						
	Dam 1 (During Dredging)	8/2/17	**212**						
	Dam 1 (Before Dredging)	1/2/17	39						
	Dam 2	14/12/16 16/12/16 20/1/17 17/2/17 1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	48 26 **64** **202** **74** **147** 5 38 20						
	Prospect Creek U/S	16/12/16	8						

Basic Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Proposed Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
Turbidity (NTU)	Dam 1 Inflow	1/3/17	133	0.1				<2 NTU (Max. of 5 NTU; Level 2 SWRU)	Table 3.3.3 cites a range of 6-50NTU for Lowland Rivers. The existing EPL uses Total Suspended Solids (TSS) instead of Turbidity, and we will assume that the EPL limit supercedes the Turbidity range above.
	Dam 1 (During Dredging)	8/2/17	231						
	Dam 1 (Before Dredging)	1/2/17	25.9						
	Dam 2	14/12/16	30.3						
		16/12/16	30.6						
		1/3/17	76.7						
		2/3/17	111						
		7/3/17	13.9						
		17/3/17	31.1						
		23/3/17	14.4						
	Prospect Creek U/S	16/12/16	6.6						
		17/3/17	10.2						
Total Hardness (mg/L, as CaCO3)	Dam 1 Inflow	1/3/17	60	1	20,000-100,000 (Aquaculture, Table 4.4.2)			500,000	The hardness of Dam 2 appears to generally be lower than that of Prospect Creek. The average Total Hardness in Dam 2 was 48 mg/L.
	Dam 1 (During Dredging)	8/2/17	52						
	Dam 1 (Before Dredging)	1/2/17	82						
	Dam 2	14/12/16	70						
		16/12/16	72						
		1/3/17	35						
		2/3/17	57						
		7/3/17	40						
		17/3/17	30						
		23/3/17	32						
	Prospect Creek U/S	16/12/16	140						
		17/3/17	84						
Hydroxide Alkalinity (mg/L, as CaCO3)	Dam 1 Inflow	20/1/17	66						
Carbonate Alkalinity (mg/L, as CaCO3)	Dam 1 Inflow	20/1/17	65						
Bicarbonate Alkalinity	Dam 1	17/2/17	112						

Basic Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Proposed Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
(mg/L, as CaCO3)	Inflow (small)								
	Dam 2	20/1/17 17/2/17	82 62						
Total Alkalinity (mg/L, as CaCO3)	Dam 1 Inflow (small)	17/2/17	112						
	Dam 1 Inflow	20/1/17	130						
	Dam 2	20/1/17 17/2/17	82 62						
Dissolved Oxygen (DO; %, mg/L)	Dam 1 Inflow (small)	17/2/17 (EMM)	22.5, 2.01						Assume DO triggers not relevant for site discharge; keeping BOD and COD below reasonable limits in the stream of interest (probably the water treatment plant discharge) should suffice.
	Dam 2	20/1/17 (EMM) 17/2/17 (EMM)	57.9, 4.76 30.5, 2.52						
Redox Potential (mV)	Dam 1 Inflow (small)	17/2/17	16	0.1					
	Dam 1 Inflow	1/3/17	52						
	Dam 1 (During Dredging)	8/2/17	88						
	Dam 1 (Before Dredging)	1/2/17	148						
	Dam 2	14/12/16 16/12/16 20/1/17 17/2/17 1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	260 261 -79.3 (EMM) -86.9 (EMM) 102 46 97 76 45						
	Prospect	16/12/16	264						

Basic Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Proposed Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
	Creek U/S	17/3/17	186						
Sulfate (as SO4, mg/L)	Dam 1 Inflow (small)	17/2/17	46	1			500,000 250,000 (aesthetic)	400,000	
	Dam 1 Inflow	20/1/17	156						
		1/3/17	109						
	Dam 1 (During Dredging)	8/2/17	60						
	Dam 1 (Before Dredging)	1/2/17	43						
	Dam 2	14/12/16	28						
		16/12/16	37						
		20/1/17	67						
		17/2/17	54						
		1/3/17	79						
		2/3/17	48						
		7/3/17	83						
		17/3/17	73						
		23/3/17	69						
	Prospect Creek U/S	16/12/16	175						
		17/3/17	47						
Chloride (mg/L)	Dam 1 Inflow (small)	17/2/17	42	1			250,000 (aesthetic)	400,000	
	Dam 1 Inflow	20/1/17	58						
		1/3/17	50						
	Dam 1 (During Dredging)	8/2/17	27						
	Dam 1 (Before Dredging)	1/2/17	35						
	Dam 2	14/12/16	41						
		16/12/16	40						
		20/1/17	44						
		17/2/17	33						
		1/3/17	32						

Basic Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Proposed Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
		2/3/17	30						
		7/3/17	39						
		17/3/17	34						
		23/3/17	38						
	Prospect Creek U/S	16/12/16	64						
		17/3/17	64						
Calcium (mg/L)	Dam 1 Inflow (small)	17/2/17	51	1					
	Dam 1 Inflow	20/1/17	63						
		1/3/17	24						
	Dam 1 (During Dredging)	8/2/17	21						
	Dam 1 (Before Dredging)	1/2/17	28						
	Dam 2	14/12/16	20						
		16/12/16	24						
		20/1/17	25						
		17/2/17	24						
		1/3/17	14						
		2/3/17	23						
		7/3/17	16						
		17/3/17	12						
		23/3/17	13						
	Prospect Creek U/S	16/12/16	23						
		17/3/17	14						
Magnesium (mg/L)	Dam 1 Inflow (small)	17/2/17	5	1					
	Dam 1 (Before Dredging)	1/2/17	3						
	Dam 2	14/12/16	6						
		16/12/16	3						
		20/1/17	3						
		17/2/17	2						
	Prospect	16/12/16	20						

Basic Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Proposed Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
	Creek U/S	17/3/17	12						
Sodium (mg/L)	Dam 1 Inflow (small)	17/2/17	32	1				300,000	
	Dam 1 Inflow	20/1/17	82						
		1/3/17	89						
	Dam 1 (During Dredging)	8/2/17	34						
	Dam 1 (Before Dredging)	1/2/17	35						
	Dam 2	14/12/16	27						
		16/12/16	30						
		20/1/17	56						
		17/2/17	34						
		1/3/17	45						
		2/3/17	43						
		7/3/17	79						
		17/3/17	67						
		23/3/17	82						
	Prospect Creek U/S	16/12/16	104						
		17/3/17	72						
Potassium (mg/L)	Dam 1 Inflow (small)	17/2/17	8	1					
	Dam 1 Inflow	20/1/17	57						
		1/3/17	47						
	Dam 1 (During Dredging)	8/2/17	17						
	Dam 1 (Before Dredging)	1/2/17	14						
	Dam 2	14/12/16	7						
		16/12/16	11						
		20/1/17	26						
		17/2/17	15						
		1/3/17	23						

Basic Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Proposed Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
		2/3/17 7/3/17 17/3/17 23/3/17	27 41 35 45						
	Prospect Creek U/S	16/12/16 17/3/17	2 5						

Table A3 – Detected Potential Contamination Analytes, with Detailed Commentary

Notes:

- The proposed trigger is the default EPL limit, or the ANZECC (2000) Guideline default trigger for a slightly-moderately disturbed system with 95% protection, unless otherwise specified.
- References to Tables and Sections refer to the ANZECC (2000) Guidelines, unless otherwise specified.
- Bolded figures indicate an exceedance of the relevant proposed trigger point.
- "Prospect Creek U/S" refers to Prospect Creek, upstream of the site licenced discharge point.

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
Gallium	Dam 1 Inflow	1/3/17	6	1		18 →			A low-reliability trigger of 18 ug/L was selected, taken from 8.3.7.1 of the ANZECC 2000 Guidelines.
	Dam 1 (During Dredging)	8/2/17	3						
	Dam 2	14/12/16 1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	4 2 3 4 4 5						
Aluminium	Dam 1 Inflow (small)	17/2/17	30	5	55	55		200	Fluoride tends to reduce aluminium toxicity. Hardness tends to reduce aluminium toxicity (but no algorithms are available, as per section 8.3.7.1). 55 ug/L trigger is for pH > 6.5, as per Table 3.4.1.
	Dam 1 Inflow	20/1/17 1/3/17	**2,610** **2,380**						
	Dam 1 (During Dredging)	8/2/17	**459**						
	Dam 1 (Before Dredging)	1/2/17	**136**						
	Dam 2	14/12/16 16/12/16 20/1/17 17/2/17 1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	**136** **172** **120** **140** **795** **1,520** **2,250** **1,900** **2,700**						
	Prospect Creek U/S	16/12/16 17/3/17	13 **203**						
Antimony	Dam 1 Inflow	1/3/17	2.7	0.5		9 →	3		Was not included in previous rounds of analysis for some reason; have modified ALS paperwork for future rounds of analysis. Trigger value is a low-reliability value taken from 8.3.7.1 of the
	Dam 2	1/3/17 2/3/17	2.2 1.4						

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
		7/3/17 17/3/17 23/3/17	1.8 1.5 1.5						ANZECC 2000 Guidelines.
	Dam 1 (During Dredging)	8/2/17	3.1						
	Dam 1 (Before Dredging)	1/2/17	1.4						
Arsenic	Prospect Creek U/S	17/3/17	0.6	0.5	13	13 →	7	50	Can exist as As(III) or As(V). 13 ug/L is the As(V) value; As(III) is 24 ug/L. The As(V) value has been selected to keep any future testing simple, and because current concentrations are an order of magnitude below the trigger level; species testing could be done in the future if concentrations become concerning.
	Dam 1 Inflow (small)	17/2/17	2						
	Dam 1 Inflow	20/1/17 1/3/17	2 1.9						
	Dam 1 (During Dredging)	8/2/17	1.6						
	Dam 1 (Before Dredging)	1/2/17	1.2						
	Dam 2	14/12/16 16/12/16 20/1/17 17/2/17 1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	0.8 1 3 3 1.6 1.1 1.6 1.4 1.9						
Barium	Dam 1 Inflow (small)	17/2/17	**34**	1		8 →	700	1,000	Not an ANZECC 2000 toxicant, and no ANZECC 2000 guidance is provided. However, a conservative trigger value will be chosen. Barium is generally readily precipitated in water, and generally easily removed in alkaline precipitation treatment processes. An ECL is proposed as a low-reliability trigger; see the appropriate section in the below “Trigger Development” section. This value may be hardness dependent, but not enough data is available to make the determination.
	Dam 1 Inflow	20/1/17 1/3/17	**17** **10**						
	Dam 1 (During Dredging)	8/2/17	**51**						

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
	Dam 1 (Before Dredging)	1/2/17	**10**						
	Dam 2	14/12/16 16/12/16 20/1/17 17/2/17 1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	**13** **9** **14** **11** 5 **11** **9** **12** **12**						
	Prospect Creek U/S	16/12/16 17/3/17	**49** **52**						
Chromium (Total)	Prospect Creek U/S	17/3/17	0.9	0.5				50	Not an ANZECC 2000 parameter; suggest that Cr(III) and Cr(IV) species are monitored separately.
	Dam 1 Inflow	20/1/17 1/3/17	36 31.5						
	Dam 1 (Before Dredging)	1/2/17	9						
	Dam 2	14/12/16 16/12/16 20/1/17 17/2/17 1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	1.1 5 4 1 13.4 16 25.6 22.4 25.7						
Trivalent Chromium	Dam 1 (During Dredging)	8/2/17	**6**	1	3.9	4.9 →	50		Cr(III) toxicity decreases with increasing hardness and alkalinity. A base ANZECC 2000 low-reliability trigger value of 3.3 ug/L exists (low hardness, 30 mg/L condition); Dam 2 hardness was an average of 48 mg/L; the hardness –modified trigger value is calculated to be 4.9 ug/L. Changes in hardness in Dam 2 (or the eventual water of concern, likely the eventual water treatment plant discharge water) may also warrant a revision of the Cr(III) trigger.
	Dam 1 (Before Dredging)	1/2/17	3.9						
	Dam 2	14/12/16 16/12/16	1 1						

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
									Note that Cr(III) is generally easily removed in many common water treatment processes.
Hexavalent Chromium	Dam 1 Inflow	1/3/17	**40**	1	1	1	50 (Table 10.5 of ADWG) 10 (Californian Maximum Contaminant Level) 0.02 (Californian Public Health Goal)		Toxicity of Cr(VI) increases in freshwater at lower pH; and decreases as salinity and sulfate concentrations increase. Cr(IV) generally requires specialised water treatment processes to remove.
	Dam 1 (During Dredging)	8/2/17	**3**						
	Dam 1 (Before Dredging)	1/2/17	**4**						
	Dam 2	16/12/16 1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	**4** **18** **17** **31** **23** **26**						
Cobalt	Dam 1 Inflow	1/3/17	2.2	0.2	1	2.8			Exists in water as Co(II) and Co(III). A low-reliability trigger of 2.8 ug/L was selected, according to section 8.3.7.1 of the ANZECC 2000 Guidelines; further, the detected concentration is an order of magnitude below the proposed trigger.
	Dam 2	1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	0.7 0.8 2.1 1.5 1.8						
	Dam 1 (During Dredging)	8/2/17	0.5						
	Prospect Creek U/S	16/12/16 17/3/17	0.2 0.6						
Copper	Dam 1 Inflow (small)	17/2/17	**3**	1	1.4	2.1 →	2,000	1,000	Copper toxicity decreases with increasing hardness and alkalinity. The hardness-modified trigger of 2.1 ug/L was calculated, based on an averagef Dam 2 hardness of 48 mg/L. This figure may need to be revised if the possible water treatment plant discharge becomes the water of interest.
	Dam 1 Inflow	20/1/17 1/3/17	**24** **24**						
	Dam 1 (During Dredging)	8/2/17	**5**						
	Dam 1 (Before Dredging)	1/2/17	**6**						

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
	Dam 2	14/12/16 16/12/16 20/1/17 17/2/17 1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	**18** **12** **6** 2 **8** **23** **21** **12** **18**						
	Prospect Creek U/S	16/12/16 17/3/17	**6** **7**						
Iron	Dam 1 Inflow	1/3/17	36	5		300 →	300 (aesthetic)	300	300 ug/L was taken from 8.3.7.1 of the ANZECC 2000 Guidelines, as an interim figure, based on the Canadian Guidelines.
	Dam 1 (During Dredging)	8/2/17	14						
	Dam 1 (Before Dredging)	1/2/17	8						
	Dam 2	14/12/16 16/12/16 1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	6 8 16 14 46 32 64						
	Prospect Creek U/S	16/12/16 17/3/17	45 **615**						
Lead	Dam 2	23/3/17	1.7	0.2	3.4	6.2 →			The hardness modified trigger value for Lead is 6.2 ug/L, using a base of 3.4 ug/L, and an average total hardness for Dam 2 of 48 mg/L.
Manganese	Dam 1 Inflow (small)	17/2/17	17	0.5	1,900	1,700 →	500 100 (aesthetic)	100	Section 8.3.7.1 of the ANZECC 2000 Guidelines refers to a moderate-reliability figure of 1,700 ug/L for freshwater; this has been selected as it is lower than the main ANZECC 2000 tabulated trigger, and because the current site concentrations are well below the trigger of 1,700 ug/L.
	Dam 2	14/12/16 16/12/16 17/2/17 23/3/17	2.8 0.9 2 0.9						
	Prospect	16/12/16	45.7						

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
	Creek U/S	17/3/17	69.5						
Molybdenum	Dam 1 Inflow (small)	17/2/17	15	0.1		34 →	50		Section 8.3.7.1 of the ANZECC 2000 Guidelines refers to a low-reliability figure of 34 ug/L.
	Dam 1 Inflow	20/1/17 1/3/17	22 25.5						
	Dam 1 (During Dredging)	8/2/17	10.9						
	Dam 1 (Before Dredging)	1/2/17	7						
	Dam 2	14/12/16 16/12/16 20/1/17 17/2/17 1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	2.6 5.7 10 12 13.8 11.4 19.1 16.6 20.6						
	Prospect Creek U/S	16/12/16 17/3/17	1.1						
Nickel	Dam 1 Inflow (small)	17/2/17	1	0.5	8	16.4 →	20	100	Trigger value is hardness dependent. ANZECC 2000 base value is 11 ug/L (at 30 mg/L. For an average Dam 2 hardness of 48 mg/L, a trigger of 16.4 ug/L was calculated. This may change if the water of interest changes and/or the hardness changes.
	Dam 1 Inflow	20/1/17 1/3/17	4 4.1						
	Dam 1 (During Dredging)	8/2/17	1.6						
	Dam 1 (Before Dredging)	1/2/17	0.8						
	Dam 2	14/12/16 16/12/16 20/1/17 17/2/17 1/3/17	1.5 0.8 1 2 1.6						

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
		2/3/17 7/3/17 17/3/17 23/3/17	1.6 4.1 2.3 3.7						
	Prospect Creek U/S	16/12/16 17/3/17	2.0 4.7						
Strontium	Dam 1 Inflow	1/3/17	**176**	10		150 →			Similar to Calcium and Barium. Removal of Strontium by alkaline precipitation is typically quite effective. Not an ANZECC 2000 toxicant, and no ANZECC 2000 guidance is provided. However, a conservative trigger value will be chosen. An ECL is proposed as a low-reliability trigger; see the appropriate section in the below "Trigger Development" section.
	Dam 1 (During Dredging)	8/2/17	104						
	Dam 1 (Before Dredging)	1/2/17	119						
	Dam 2	14/12/16 16/12/16 1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	84 100 90 126 **150** 138 **167**						
	Prospect Creek U/S	16/12/16 17/3/17	**210** 120						
Uranium	Prospect Creek U/S	17/3/17	0.2	0.1		0.5 →	20		Section 8.3.7.1 of the ANZECC 2000 Guidelines refers to a low-reliability figure of 0.5 ug/L. Toxicity of Uranium generally decreases as alkalinity increases, particularly the Carbonate ion.
	Dam 1 (Before Dredging)	1/2/17	0.2						
	Dam 2	14/12/16 16/12/16	0.2 0.2						
Vanadium	Dam 1 Inflow (small)	17/2/17	**20**	0.5		6 →			Vanadium has a number of different ionic forms, with V(V) the most common, and the most toxic. Some studies suggest a trend of decreasing toxicity with increasing hardness. Section 8.3.7.1 of the ANZECC 2000 Guidelines refers to a low-reliability figure of 6 ug/L.
	Dam 1 Inflow	20/1/17 1/3/17	**40** **53.4**						
	Dam 1 (During Dredging)	8/2/17	**56**						
	Dam 1	1/2/17	**26.6**						

Detected Analyte	**Detected Location**	**Detection Date(s)**	**Conc. (ug/L)**	**ALS LOR (ug/L)**	**Preliminary Trigger Point (ug/L)**	**Revised Trigger Point (ug/L)**	**Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)**	**Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)**	**Commentary**
	(Before Dredging)								
	Dam 2	14/12/16 16/12/16 20/1/17 1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	**8.4** **15.9** **20** **44.9** **30.9** **43** **43.8** **39.8**						
	Prospect Creek U/S	16/12/16 17/3/17	0.7 1.8						
Zinc	Dam 1 Inflow (small)	17/2/17	5	5	8	11.9	3,000 (aesthetic)	5,000	Zinc toxicity generally decreases with increasing salinity. Zinc toxicity also generally decreases with increasing hardness. With a base of 8 ug/L, the hardness-modified trigger was calculated as 11.9 ug/L, using an average total hardness for Dam 2 of 48 mg/L.
	Dam 2	14/12/16 23/3/17	8 6						
	Prospect Creek U/S	16/12/16 17/3/17	**12** 10						
Fluoride	Dam 1 Inflow (small)	17/2/17	**800**	100	120 (Canadian Guideline, 2002)	115 →		1,500 (ADWG/NHMRC Maximum Guideline value). 1,000 (LTV for Irrigation, Table 4.2.10). 2,000 (STV for Irrigation, Table 4.2.10). 2,000 (Livestock drinking water, Table 4.3.2) 20 ("Fluorides", Aquaculture, Table 4.4.3)	Fluoride tends to reduce aluminium toxicity. Hardness tends to reduce fluoride toxicity. Chloride concentration is also a known toxicity modifying factor. Fluoride tends to precipitate readily under alkaline conditions in the presence of calcium. Fluoride also mitigates Aluminium toxicity, suggesting it binds with dissolved Aluminium. The ANZECC Guidelines do not provide a trigger for Fluoride. However, a conservative trigger value will be chosen. An ECL is proposed as a low-reliability trigger; see the appropriate section in the below "Trigger Development" section. The precision of future testing can be improved by using an alternative ALS method, ED009, which has an LOR of 10 ug/L.
	Dam 1 Inflow	1/3/17	**200**						
	Dam 2	20/1/17 17/2/17 1/3/17 2/3/17 7/3/17	**587** **600** **300** **300** **200**						
Total Residual Chlorine	Dam 2	1/3/17 23/3/17	**30** **20**	20	3	3	1,000 ug/L (target requirement for SWRU)		Note that the LOR for Chlorine (20 ug/L) exceeds the proposed trigger value of 3 ug/L. However, chlorine is generally readily removed by natural processes, and should not persist.
	Dam 1 Inflow	1/3/17	**30**						
	Dam 1 (During	8/2/17	**20**						

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
	Dredging)								
	Prospect Creek U/S	16/12/16 17/3/17	**50** **20**						
Total Cyanide	Dam 2	1/3/17 7/3/17 17/3/17 23/3/17	**10** **8** **7** **8**	4	7	7			
Ammonia	Dam 1 Inflow (small)	17/2/17	**140**	5	20	20 →	500 (aesthetic)	10	EPA suggested that the Ammonia trigger should be 20 ug/L, as per Table 3.3.2, Lowland River, footnote (d). The default value of 900 ug/L for 95% protection in the main reference table 3.4.1 relates to toxicology; but the Lowland River figure refers to a value that is intended to prevent ecological issues such as algal blooms due to excessive bioavailable nutrients.
	Dam 1 Inflow	20/1/17 1/3/17	**250** **114**						
	Dam 1 (During Dredging)	8/2/17	**394**						
	Dam 1 (Before Dredging)	1/2/17	**142**						
	Dam 2	14/12/16 16/12/16 20/1/17 17/2/17 1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	**176** **31** **130** **690** **113** **139** **337** **152** **284**						
	Prospect Creek U/S	16/12/16 17/3/17`	16 42						
Nitrite (as N)	Dam 1 Inflow (small)	17/2/17	30	1			3,000	1,000	Not an ANZECC 2000 toxicant, and no ANZECC 2000 guidance is provided. However, a conservative trigger value may be chosen, or it may be deemed that a Total NOx analysis figure is sufficient.
	Dam 1 Inflow	20/1/17 1/3/17	1,500 1,060						
	Dam 1 (During Dredging)	8/2/17	371						
	Dam 1 (Before	1/2/17	167						

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
	Dredging)								
	Dam 2	14/12/16 16/12/16 20/1/17 17/2/17 1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	21 100 40 420 1,060 755 967 2,460 3,150						
	Prospect Creek U/S	16/12/16 17/3/17	6 30						
Nitrate (as N)	Dam 1 Inflow (small)	17/2/17	**50**	2	700	40 →	50,000	10,000	Nitrate trigger selected as 40 ug/L, as per Table 3.3.2, Lowland River, footnote (d), for Total NOx; this implies that Total NOx probably should be part of a monitoring program. The default value for 95% protection in the main reference table 3.4.1 relates to toxicology; but the Lowland River figure refers to a value that is intended to prevent ecological issues such as algal blooms due to excessive bioavailable nutrients.
	Dam 1 Inflow	20/1/17 1/3/17	**1,190** **10,700**						
	Dam 1 (During Dredging)	8/2/17	**592**						
	Dam 1 (Before Dredging)	1/2/17	**345**						
	Dam 2	14/12/16 16/12/16 20/1/17 17/2/17 1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	**63** **382** **530** **300** **1,940** **2,340** **6,100** **2,240** **2,370**						
	Prospect Creek U/S	16/12/16 17/3/17	**222** **129**						
NOx (Nitrite + Nitrate, as N)	Dam 1 Inflow (small)	17/2/17	**80**	2	n/a	40 →			Not in Table 3.4.1. However, Total NOx figure is being considered as a trigger, at 40 ug/L, as per Table 3.3.2, Lowland River, footnote (d), for Total NOx; this implies that Total NOx must be part of a monitoring program. Not an ANZECC (2000) analyte.
	Dam 1 Inflow	20/1/17 1/3/17	**2,690** **11,800**						

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
	Dam 1 (During Dredging)	8/2/17	**963**						
	Dam 1 (Before Dredging)	1/2/17	**512**						
	Dam 2	14/12/16	**84**						
		16/12/16	**482**						
		20/1/17	**570**						
		17/2/17	**720**						
		1/3/17	**3,000**						
		2/3/17	**3,100**						
		7/3/17	**7,070**						
		17/3/17	**4,700**						
		23/3/17	**5,520**						
	Prospect Creek U/S	16/12/16	**228**						
		17/3/17	**159**						
TKN (Total Kjeldahl Nitrogen, as N)	Dam 1 Inflow (small)	17/2/17	1,400	10	n/a				Not an ANZECC (2000) analyte. Will probably not pursue as a future monitoring analyte for trigger purposes.
	Dam 1 Inflow	20/1/17	1,600						
		1/3/17	1,000						
	Dam 1 (During Dredging)	8/2/17	1,460						
	Dam 1 (Before Dredging)	1/2/17	750						
	Dam 2	14/12/16	1,980						
		16/12/16	680						
		20/1/17	700						
		17/2/17	1,800						
		1/3/17	1,920						
		2/3/17	910						
		7/3/17	380						
		17/3/17	1,590						
		23/3/17	2,430						
	Prospect Creek U/S	16/12/16	510						
		17/3/17	930						

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
Total Nitrogen (as N)	Dam 1 Inflow (small)	17/2/17	**1,500**	10	350	350			Total Nitrogen trigger is 0.35 mg/L (350 ug/L), as per Table 3.3.2, Lowland River, footnote (d). The default value for 95% protection in the main reference table 3.4.1 relates to toxicology; but the Lowland River figure refers to a value that is intended to prevent ecological issues such as algal blooms due to excessive bioavailable nutrients.
	Dam 1 Inflow	20/1/17 1/3/17	**4,300** **12,800**						
	Dam 1 (During Dredging)	8/2/17	**2,420**						
	Dam 1 (Before Dredging)	1/2/17	**1260**						
	Dam 2	14/12/16 16/12/16 20/1/17 17/2/17 1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	**2,060** **1,160** **1,300** **2,500** **4,920** **4,010** **7,450** **6,290** **7,950**						
	Prospect Creek U/S	16/12/16 17/3/17	**740** **1,090**						
Total Phosphorous	Dam 1 Inflow (small)	17/2/17	**80**	5	25	25 →			Trigger selected from Table 3.3.2, Lowland River, Footnote (d). Note that the analytical method selected for these tests involves the Total Phosphorous from a filtered sample – this may effectively constitute Filterable Reactive Phosphate but is nonetheless somewhat representative of a simple clarification process in a water treatment plant, the rationale of which has been discussed previously.
	Dam 1 Inflow	20/1/17 1/3/17	**100** 22						
	Dam 1 (During Dredging)	8/2/17	**176**						
	Dam 1 (Before Dredging)	1/2/17	**48**						
	Dam 2	14/12/16 16/12/16 20/1/17 17/2/17 1/3/17 2/3/17	13 8 20 **200** 9 **68**						

Detected Analyte	**Detected Location**	**Detection Date(s)**	**Conc. (ug/L)**	**ALS LOR (ug/L)**	**Preliminary Trigger Point (ug/L)**	**Revised Trigger Point (ug/L)**	**Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)**	**Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)**	**Commentary**
		7/3/17 17/3/17 23/3/17	12 **143** 16						
	Prospect Creek U/S	16/12/16 17/3/17	20 **147**						
Reactive Phosphorous (as P)	Dam 1 Inflow (small)	17/2/17	**20**	10	20	20 →			20 ug/L selected as the trigger, as per Table 3.3.2.
Total Organic Carbon (TOC)	Prospect Creek U/S	17/3/17	20,000	1,000					Not an ANZECC analyte; included for general purposes.
	Dam 2	1/3/17 7/3/17 17/3/17 23/3/17	7,000 13,000 11,000 13,000						
	Dam 1 Inflow	1/3/17	15,000						
Oil and Grease	Dam 1 Inflow	1/3/17	6,000	5,000	50,000	50,000			Trigger is the EPL limit for Oil and Grease.
Total Petroleum Hydrocarbons: C6-C9 Fraction	Prospect Creek U/S	17/3/17	320	20					Not an ANZECC analyte; included as a general contaminant category only.
Total Petroleum Hydrocarbons: C10-C14 Fraction	Prospect Creek U/S	17/3/17	80	50					Not an ANZECC analyte; included as a general contaminant category only.
Total Petroleum Hydrocarbons: C15-C28 Fraction	Dam 1 Inflow (small)	17/2/17	140	100					Not an ANZECC analyte; included as a general contaminant category only.
Total Recoverable Hydrocarbons: C6-C10 Fraction	Prospect Creek U/S	17/3/17	320	20					Not an ANZECC analyte; included as a general contaminant category only.
Total Recoverable Hydrocarbons: C6-C10 Fraction (minus BTEX)	Prospect Creek U/S	17/3/17	200	20					Not an ANZECC analyte; included as a general contaminant category only.
Total Recoverable Hydrocarbons: C16-C34 Fraction	Dam 1 Inflow (small)	17/2/17	140	100					Not an ANZECC analyte; included as a general contaminant category only.
Anionic Surfactants (Anionic Sulfonates, as MBAS)	Prospect Creek U/S	17/3/17	**100**	0.1	50	50 →		200	The 50 ug/L trigger point was selected by, based on the 99% level of protection for Alcohol Ethoxylated Sufactants (AE). The MBAS test, with such as low trigger as this, could be used as a
	Dam 1	1/3/17	**200**						

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
	Inflow								trigger for further investigation into the classes of surfactants present in the water of interest. The MBAS analytical method only tests for Anionic Sulfonates (including Linear Alkylbenzene sulfonates, LAS), and does not include AES (alkyl ethoxylated sulfates), or the non-ionic surfactants AE and APE (alcohol ethoxylates and alkylphenol ethoxylates, respectively), nor does it include cationic surfactants. It should be noted that surfactants generally have a high affinity for particulates.
	Dam 1 (During Dredging)	8/2/17	**300**						
	Dam 2	14/12/16 16/12/16 2/3/17 7/3/17	**100** **100** **400** **300**						
Phenol	Dam 2	14/12/16	60.8	1	320	320		2 →	320 ug/L selected as the trigger, as per the main table 3.4.1. Table 5.2.3 lists the "Phenolics" limit as 2 ug/L (for human recreational purposes) – this may imply that the general class of Phenol-type chemicals should not total more than 2 ug/L for this sort of exposure. Phenolics are readily oxidised and biodegraded, amenable to a number of water treatment processes.
	Prospect Creek U/S	16/12/16	3.1						
2-Methylphenol	Dam 2	14/12/16	**234**	1	400 (o-cresol, tainting of fish flesh).	13 →			Often known as a form of "Cresol", particularly ortho-cresol; often found naturally in tars. An Environmental Concern Level (ECL) is proposed; see this chemical's section in the "Trigger Development" section, below.
3- & 4-methylphenol	Dam 2	14/12/16	**509**	2	200 (m-cresol, tainting of fish flesh). 100 (p-cresol, tainting of fish flesh).	35 →			Often known as a form of "Cresol", particularly meta-cresol for 3-methylphenol; and, para-cresol for 4-methylphenol. Often found naturally in tars. An Environmental Concern Level (ECL) is proposed; see this chemical's section in the "Trigger Development" section, below.
2,4-Dimethylphenol	Dam 2	14/12/16	**142**	1		2 →			Also known as 2,4-Xylenol, or m-Xylenol. Often naturally occurring, derived from petroleum and tar distillation. Low-reliability figure of 2 ug/L selected from section 8.3.7.
Aniline	Dam 2	14/12/16	**28**	2	8	8			Includes a carbon ring. Urethane precursor. Rubber processing chemical. Herbicide.
Toluene	Dam 1 (During Dredging)	8/2/17	1	0.05		180 →	800 25 (aesthetic)		Monocyclic Aromatic Hydrocarbon. Table 8.3.14 suggests a low-reliability trigger of 180 ug/L.
	Dam 1 (Before	1/2/17	1						

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
	Dredging)								
	Dam 2	16/12/16 2/3/17 7/3/17	0.9 0.9 0.5						
	Prospect Creek U/S	16/12/16 17/3/17	1 115						
Ethylbenzene	Dam 2	16/12/16 2/3/17 7/3/17 23/3/17	0.06 0.07 0.06 0.05	0.05		80 →			Monocyclic Aromatic Hydrocarbon. Often in tars. A common precursor to Styrene. Section 8.3.7.7 states a low-reliability trigger for 95% protection of 80 ug/L (QSAR derived).
	Prospect Creek U/S	16/12/16 17/3/17	0.09 0.06						
meta- & para-xylene	Dam 1 (During Dredging)	8/2/17	0.1	0.05		200 →	600 (total, all isomers of xylene) 20 (aesthetic)		Monocyclic Aromatic Hydrocarbon. BTEX chemical. The 200 ug/L figure is from Table 3.4.1 for para-xylene. As per section 8.3.7.7, the isomers of meta- and para-xylene are very similar, very difficult to separate analytically, and are to be considered to have very similar, additive toxicities .
	Dam 1 (Before Dredging)	1/2/17	0.06						
	Dam 2	16/12/16 2/3/17 7/3/17 17/3/17 23/3/17	0.21 0.29 0.27 0.07 0.08						
	Prospect Creek U/S	16/12/16 17/3/17	0.35 0.15						
Styrene	Dam 1 (During Dredging)	8/2/17	0.51	0.05	250 (Taints fish flesh, Table 4.4.5)	17 →	30 20 (WHO) 4 (aesthetic) 100 (US FDA)		Monocyclic Aromatic Hydrocarbon. Often found in tars. Not an ANZECC 2000 listed contaminant. An Environmental Concern Level (ECL) is proposed; see this chemical's section in the "Trigger Development" section, below.
	Dam 1 (Before Dredging)	1/2/17	0.36						
ortho-xylene	Dam 2	16/12/16 2/3/17 7/3/17	0.05 0.22 0.15	0.05	350	350	600 (total, all isomers of xylene) 20 (aesthetic)		Monocyclic Aromatic Hydrocarbon. Trigger is from Table 3.4.1.
	Prospect Creek U/S	16/12/16 17/3/17	0.07 0.13						
1,2,4-Trimethylbenzene	Prospect Creek U/S	17/3/17	0.05	0.05					Found naturally in tars and petroleum; is also a petroleum additive. Not an ANZECC 2000 listed contaminant, and not found in Dam

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
									2. Therefore, no trigger will be provided.
Dichloromethane	Prospect Creek U/S	17/3/17	1.4	1		4,000 →	4		Table 8.3.11 suggests a low-reliability trigger of 4,000 ug/L, suggesting that this specie has a relatively low aquatic toxicology.
	Dam 1 Inflow	1/3/17	3.8						
	Dam 2	1/3/17 2/3/17 7/3/17	1.4 2.5 1.2						
1,2-Dichloroethane	Dam 1 Inflow	1/3/17	0.2	0.1		1,900 →			Table 8.3.12 suggests a low-reliability trigger of 1,900 ug/L, suggesting that this specie has a relatively low aquatic toxicology.
	Dam 2	1/3/17 2/3/17	0.2 0.1						
Trichloroethene	Dam 2	1/3/17	0.09	0.05		330 →		30 (Recreational, Table 5.2.3)	Also known as Trichloroethylene, or 1,1,2-Trichloroethene, or 1,1,2-trichloroethylene (ANZECC 2000 reference); CAS: 79-01-6 (provided for disambiguation). Table 8.3.13 provides a low-reliability trigger of 330 ug/L.
	Dam 1 Inflow	1/3/17	0.06						
Chlorobenzene (Monochlorobenzene)	Dam 1 Inflow	1/3/17	0.15	0.1	250 (acute, US EPA, 1996) 50 (chronic, US EPA, 1996) 15 (Canadian WQG, 1991)	55 →	300		Involves a carbon ring. Common precursor to Phenol. A table in section 8.3.7.8 suggests a low-reliability trigger, for 95% protection, of 55 ug/L.
	Dam 1 (During Dredging)	8/2/17	0.31						
	Dam 1 (Before Dredging)	1/2/17	0.3						
	Dam 2	16/12/16 1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	0.3 0.22 0.27 0.15 0.55 0.54						
Chloroform	Dam 1 Inflow	1/3/17	0.16	0.1		370 →	100 (US EPA Drinking Water Limit) -		Chlorinated Alkane. Can occur in municipal drinking water, as a by-product of chlorinated disinfection. Table 8.3.11 suggests a low-reliability trigger of 370 ug/L.
	Dam 1 (During Dredging)	8/2/17	0.32						
	Dam 1 (Before Dredging)	1/2/17	1.53						
	Dam 2	14/12/16	13.1						

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
		16/12/16 1/3/17 2/3/17 17/3/17 23/3/17	1.49 0.17 0.27 0.1 0.11						
Bromodichloromethane	Dam 1 (Before Dredging)	1/2/17	0.39	0.1		22 →	(4, for Dichloromethane)		Can occur in municipal drinking water, as a by-product of chlorinated disinfection. Not an ANZECC 2000 listed contaminant. An Environmental Concern Level (ECL) is proposed; see this chemical's section in the "Trigger Development" section, below.
	Dam 2	14/12/16 16/12/16	5.85 0.57						
Dibromochloromethane	Dam 1 (Before Dredging)	1/2/17	0.14	0.1		12 →			Can occur in municipal drinking water, as a by-product of chlorinated disinfection. Not an ANZECC 2000 listed contaminant. An Environmental Concern Level (ECL) is proposed; see this chemical's section in the "Trigger Development" section, below.
	Dam 2	14/12/16 16/12/16	1.38 0.14						
	Dam 1 (During Dredging)	8/2/17	0.32						
	Dam 1 (Before Dredging)	1/2/17	2.06						
	Dam 2	14/12/16 16/12/16 1/3/17 2/3/17	20.3 2.2 0.17 0.27						
Naphthalene	Dam 1 (During Dredging)	8/2/17	0.05	0.05	16	16			Involves two carbon rings. Fumigant. Pesticide. Often comes from tars.
	Dam 2	14/12/16 17/3/17	0.23 0.14						
Ethanol	Dam 2	2/3/17	410	50		1,400			
Isopropanol (aka Isopropyl alcohol)	Prospect Creek U/S	17/3/17	94	50		4,200 →			Table 8.3.7.3 suggested a low-reliability trigger of 4,200 ug/L, and advises that it can depress dissolved oxygen in waterbodies.
	Dam 1 Inflow	1/3/17	201						
	Dam 2	1/3/17 2/3/17 7/3/17	71 650 70						

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
		17/3/17	91						
Nitrobenzene	Dam 2	14/12/16	4.7	1	550	550			Explosive. Involves a carbon ring.
Atrazine	Dam 2	16/12/16	0.02	0.01	13	13	40		Herbicide. Involves a partially nitrogen-substituted carbon ring.
Benomyl (aka Benlate)	Dam 1 Inflow	1/3/17	0.83	0.01		1.65 →	100	200 (Recreational)	Involves carbon rings. Fungicide, Miticide. An Environmental Concern Level (ECL) is proposed; see this chemical's section in the "Trigger Development" section, below.
	Dam 1 (During Dredging)	8/2/17	0.26						
	Dam 1 (Before Dredging)	1/2/17	0.25						
	Dam 2	14/12/16	0.08						
		16/12/16	0.19						
		17/2/17	0.18						
		1/3/17	0.42						
		2/3/17	0.43						
		7/3/17	0.5						
		17/3/17	0.38						
		23/3/17	0.37						
Bromacil	Dam 1 Inflow	1/3/17	0.03	0.02		180 →			Involves a partially nitrogen-substituted carbon ring, and some halogenation. Herbicide. Section 8.3.7.20 suggests a low-reliability trigger of 180 ug/L.
Carbendazim (Thiophanate methyl)	Dam 1 Inflow	1/3/17	**1.8**	0.1		0.5 →	100	200 (Recreational)	Fungicide. Is a metabolite of Benomyl. An Environmental Concern Level (ECL) is proposed; see this chemical's section in the "Trigger Development" section, below.
	Dam 1 (Before Dredging)	1/2/17	0.2						
	Dam 2	16/12/16	0.2						
		17/2/17	0.2						
		1/3/17	**1.1**						
		2/3/17	**0.6**						
		7/3/17	**0.6**						
		17/3/17	0.4						
		23/3/17	0.4						
Cyromazine	Dam 2	7/3/17	0.06	0.05		84 →			Involves a partially nitrogen-substituted carbon ring. Pesticide.

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
									Not an ANZECC 2000 listed contaminant. An Environmental Concern Level (ECL) is proposed; see this chemical's section in the "Trigger Development" section, below.
Diazinon	Dam 1 (During Dredging)	8/2/17	**0.16**	0.01		0.01	3	10	Insecticide. Organophosphate. Involves a partially nitrogen-substituted carbon ring.
	Dam 1 (Before Dredging)	1/2/17	**0.17**						
Irgarol (aka Cybutryne)	Dam 1 Inflow	1/3/17	0.004	0.002		8.3 →			Pesticide, Herbicide, Algaecide (Triazine family). Involves a partially nitrogen-substituted carbon ring. Not an ANZECC 2000 listed contaminant. An Environmental Concern Level (ECL) is proposed; see this chemical's section in the "Trigger Development" section, below.
	Dam 2	1/3/17 2/3/17 17/3/17 23/3/17	0.002 0.005 0.002 0.005						
	Dam 1 (During Dredging)	8/2/17	0.003						
Metolachlor	Dam 2	14/12/16 16/12/16	0.01 0.02	0.01		8.2 →		800	Herbicide. Involves a carbon ring. Derivative of Aniline. Not an ANZECC 2000 listed contaminant. An Environmental Concern Level (ECL) is proposed; see this chemical's section in the "Trigger Development" section, below.
Simazine	Dam 1 Inflow	1/3/17	0.04	0.02	3.2	3.2	20		Herbicide. Involves a partially nitrogen-substituted carbon ring.
	Dam 1 (Before Dredging)	1/2/17	0.03						
	Dam 2	16/12/16 1/3/17 2/3/17	0.04 0.02 0.03						
Tebuthiuron	Dam 2	17/3/17 23/3/17	0.06 0.1	0.02		2.2			Broad-spectrum, urea-based herbicide. Involves a partially nitrogen and sulphur substituted carbon ring.
Thiamethoxam	Dam 2	2/3/17	0.02	0.02		0.25 →			Involves partially nitrogen-substituted carbon rings, with some partial oxygen and sulphur substitution, and with some

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
									halogenation. Insecticide. An Environmental Concern Level (ECL) is proposed; see this chemical's section in the "Trigger Development" section, below.
2,4-Dinitrophenol	Dam 1 (During Dredging)	8/2/17	0.03	0.01	45	45			Phenolics and Related Compounds. Involves a carbon ring.
	Dam 1 (Before Dredging)	1/2/17	0.02						
	Dam 2	16/12/16 17/3/17 23/3/17	0.01 0.07 0.06						
	Prospect Creek U/S	16/12/16	0.02						
4-Nonylphenol (mixture of isomers)	Dam 2	17/3/17 23/3/17	0.13 **0.39**	0.1		0.19 →			Involves a carbon ring. Precursor to many different types of chemicals. Derivative of phenol. By-product of the environmental degradation of alkylphenol ethoxylates (non-ionic surfactants). Also produced naturally on occasion. Not an ANZECC 2000 listed contaminant. An Environmental Concern Level (ECL) is proposed; see this chemical's section in the "Trigger Development" section, below.
	Dam 1 (During Dredging)	8/2/17	**0.2**						
4-Nitrophenol	Dam 1 Inflow	1/3/17	0.13	0.1		58 →			Phenolics and Related Compounds. Section 8.3.7.11 provides a low-reliability trigger of 58 ug/L.
	Dam 1 (During Dredging)	8/2/17	0.48						
	Dam 1 (Before Dredging)	1/2/17	0.14						
	Dam 2	16/12/16 17/2/17 1/3/17 2/3/17 7/3/17	0.24 0.13 0.30 0.37 0.76						

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
		17/3/17 23/3/17	1.02 1.2						
4-Chloro-3-methylphenol	Dam 2	17/3/17 23/3/17	0.87 1.1	0.1		2 →			Also known as p-Chlorocresol. Involves a carbon ring. Antiseptic, preservative. Not an ANZECC 2000 listed contaminant. An Environmental Concern Level (ECL) is proposed; see this chemical's section in the "Trigger Development" section, below.
	Dam 1 (During Dredging)	8/2/17	0.52						
Pentachlorophenol (aka PCP)	Dam 1 (During Dredging)	8/2/17	0.41		30 (tainting of fish flesh)	3.6		10 (Recreational)	Involves a carbon ring. Derivative of phenol. Biocide, disinfectant, pesticide, herbicide, fungicide. Common in chlorinated wastewaters. As per section 8.3.7.10, fish flesh tainting is not expected to be an issue, so the ANZECC trigger was not modified.
	Dam 2	17/2/17 7/3/17 17/3/17	0.13 0.27 0.19						
Dalapon	Dam 2	14/12/16 17/3/17 23/3/17	0.31 0.14 0.12	0.1		4 →		4 (Irrigation, Table 4.2.12)	Selective herbicide. Chlorinated short-chain carbon compound. Not an ANZECC 2000 listed contaminant. An Environmental Concern Level (ECL) is proposed; see this chemical's section in the "Trigger Development" section, below.
Bisphenol-A	Dam 1 Inflow	1/3/17	0.22	0.05		4.7 →			Includes carbon rings. Derivative of Phenol. Commonly leaches from plastics (incl epoxy resin), papers and metals into the environment. Not an ANZECC 2000 listed contaminant. An Environmental Concern Level (ECL) is proposed; see this chemical's section in the "Trigger Development" section, below.
	Dam 1 (During Dredging)	8/2/17	0.36						
	Dam 1 (Before Dredging)	1/2/17	0.79						
	Dam 2	14/12/16 17/2/17 1/3/17 7/3/17 17/3/17 23/3/17	0.57 0.22 1.53 0.32 3.01 0.8						
Biological Oxygen Demand, "BOD5" (5-day)					< 15,000 (Aquaculture, Table 4.4.2)				Numerous tests conducted, but all results were below detection.
Chemical Oxygen Demand,	Prospect	17/3/17	42,000		< 40,000				

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
"COD"	Creek U/S				(Aquaculture, Table 4.4.2)				
	Dam 1 Inflow	1/3/17	58,000						
	Dam 2	1/3/17 2/3/17 7/3/17 17/3/17	36,000 19,000 48,000 21,000						
	Dam 1 (During Dredging)	8/2/17	21,000						
Total Plate Count / Total Heterotrophic Plate Count (cfu/ml)	Prospect Creek U/S	17/3/17	33,000						
	Dam 1 Inflow	1/3/17	16,000						< 100,000 cfu/ml for cooling towers (drift/spray risk).
	Dam 2	2/3/17 7/3/17 17/3/17 23/3/17	57,000 1,500 460 1,600						
Total Coliforms (Faecal, aka Thermo-tolerant; cfu/100ml)	Prospect Creek U/S	17/3/17	2,400					1,000 / 100ml (Table 5.2.2, Secondary Contact)	
	Dam 2	1/3/17 17/3/17	140 ~1						
E. Coli (cfu/100ml)	Prospect Creek U/S	17/3/17	140				< 10cfu/100ml (SWRU Level 2)		
	Dam 2	1/3/17	19						
Reactive Silica	Prospect Creek U/S	17/3/17	12,000						Can be a micro-nutrient in natural waters for some aquatic flora and fauna. Can assist in the mitigation of some other contaminants, particularly heavy metals, by precipitation in alkaline waters. No specific guidance is provided in the ANZECC (2000) Guidelines; and, very little seems readily available in literature regarding the potential aquatic toxicity of reactive silica. As a result, no trigger value will be provided at this point in time.
	Dam 1 Inflow	1/3/17	18,000						
	Dam 2	1/3/17 2/3/17 7/3/17 17/3/17 23/3/17	10,900 11,100 17,000 8,320 4,330						
Acrylamide / Acrylic Acid Co-polymers (anionic flocculant)	(none)					1,000			This relates to the floc blocks that are currently being used at site, to treat water overflowing from Dam 1 into Dam 2. It is estimated that the floc blocks in place will dose at

Detected Analyte	Detected Location	Detection Date(s)	Conc. (ug/L)	ALS LOR (ug/L)	Preliminary Trigger Point (ug/L)	Revised Trigger Point (ug/L)	Australian Drinking Water Guidelines Limits (ug/L; Assumes 2L consumption)	Recreational Guidelines Limits (ug/L) Section 5.2.2 of Vol 1 of the ANZECC 2000 Guidelines, for Secondary Contact; Stormwater Re-Use (SWRU) Guidelines (DoEC NSW, 2006)	Commentary
									0.5-2 mg/L, and that most will bind to the suspended solids into turbid water. 95% protection; from Table 10 of: “Harford AJ, Hogan AC & van Dam RA 2010. Ecotoxicological assessment of a polyelectrolyte flocculant. Internal Report 575, June, Supervising Scientist, Darwin.”

APPENDIX B

Trigger Development

Introductory Notes

Regarding references from Appendix A: This section provides details on the development of customised "Environmental Concern Levels" (ECLs), or "low-reliability trigger levels", as per section 8.3.4.5 of the ANZECC (2000) Guidelines, where the Guidelines do not provide a trigger level recommendation for particular analytes.

All low-reliability triggers are conservative by nature of their derivation, and should be considered preliminary. Boral reserve the right to modify low-reliability triggers in the future, should superior quality data become available.

Notes:

- "PNEC" refers to a "Predicted No-Effect Concentration", which is a similar notion to ECL, sometimes used in aquatic toxicology estimation.
- "QSAR" refers to "Quantitative Structure Activity Relationships", and is generally a software method of toxicological estimation based on the atomic structure of chemicals.
- "T.E.S.T." refers to the US EPA's "Toxicity Estimation Software Tool" – a QSAR system that also utilises ecotoxicological data from the USEPA's large ECOTOX database.
- "LOEC" refers to "Lowest Observable Effect Concentration".
- "NOEC" refers to "No Observable Effect Concentration".
- "ICG50" refers to the half-inhibitory concentration for Growth.
- "LOR" refers to "Limit of Reporting".

Barium (CAS 7440-39-3) - Development of an ECL, or Low-Reliability Trigger

The following link discusses some Barium aquatic toxicity results: http://www.inchem.org/documents/cicads/cicads/cicad33.htm#10.1

From the above link, the following results are selected, in accordance with section 8.3.4.5:

- Daphnia Magna:
  - LC50, acute, 48-hour: 14.5 mg/L.
  - LC50, chronic, 21-days: 12.2 mg/L.
- Crayfish, Austropotamobius pallipes pallipes:
  - LC50, acute, 96-hour: 46 mg/L.
  - LC50, chronic, 30-days: 39 mg/L.
- Fish:
  - Sheepshead minnow, acute, 96-hour: LC50 > 500 mg/L.

From the above dataset, in accordance with section 8.3.4.5, the following ECL can be determined, using the chronic LC50 for Daphnia Magna of 12.2 mg/L, and a reduction factor of 1,000:

$$ECL1 = 12.2 \text{ mg/L} / 1{,}000 = 0.00122 \text{ mg/L} \sim 12 \text{ ug/L}$$

The following link provides an ECL-type value of 4 ug/L (ECL2): https://clu-in.org/download/contaminantfocus/dnapl/Toxicology/DOE_SW_tox_valuep76.pdf. This figure is consistent with ECL1.

The following link references similar data to the above link, and similar results can be determined: http://apps.who.int/iris/bitstream/10665/42398/1/9241530332.pdf

As a result, the average of ECL1 and ECL2 will be taken: 8 ug/L.

The proposed low-reliability trigger for Barium is: 8 ug/L.

Strontium (7440-24-6) - Development of an ECL, or Low-Reliability Trigger

Data on the aquatic ecotoxicity of Strontium is not readily available, suggesting it is not generally viewed as a significant aquatic toxicant.

The following link proposes an ECL-type value for Strontium of 1,500 ug/L (ECL): https://clu-in.org/download/contaminantfocus/dnapl/Toxicology/DOE_SW_tox_valuep76.pdf

However, on the basis of technical judgement, and in the interest of developing conservative trigger selection, a trigger of one-tenth of the above figure: 150 ug/L. This is because:

- To account for the scarcity of data, and their opinion that the 1,500 ug/L is derived from an older (1999) source that is also scarce in data;
- Comparison of the 1,500 ug/L figure seems anomalously high when compared to the triggers for other dissolved metals – for example, iron (which typically has a relatively low aquatic toxicity) at 300 ug/L; it is the technical judgement of Boral’s consultant that an appropriate trigger level might be significantly lower;
- The detected concentrations are close to, but generally less than, 150 ug/L, and 150 ug/L therefore seems like a reasonable trigger for further management action.

The proposed low-reliability trigger for Strontium is: 150 ug/L.

Fluoride (16984-48-8) - Development of an ECL, or Low-Reliability Trigger

Data from the following document was used to develop an ECL:
https://fluorideresearch.files.wordpress.com/2014/01/fluoride-toxicity-to-aquatic-organisms-a-review-julio-a-camargo.pdf

In accordance with section 8.3.4.5, the lowest LC50 from the good quality dataset was 11.5 mg/L, for the *Hydropsyche bronta*, at 144 hours, with a total hardness of 40.2 mg/L; using a reduction factor of 100, the following ECL is determined:

ECL = 11.5 mg/L / 100 = 0.115 mg/L = 115 ug/L.

This figure is consistent with the Canadian Guideline for Fluoride.

This figure could be increased by adjusting for the higher hardness concentrations in Dam 2 and Prospect Creek; hence, the above ECL is a preliminary figure.

The proposed preliminary low-reliability trigger for Fluoride is: 115 ug/L.

2-Methyphenol (2-Cresol, Ortho-cresol, o-cresol; CAS 95-48-7) - Development of an ECL, or Low-Reliability Trigger

No specific guidance for this specie is provided in the ANZECC 2000 Guidelines.

The following link provided some informative aquatic toxicity data:
http://www.inchem.org/documents/sids/sids/95487.pdf

The above linked document calculated a PNEC (QSAR-based) of 12 ug/L, based on chronic data for 2-Methylphenol; say this is ECL1.

The US EPA "T.E.S.T." ecotoxicity prediction software generated the following results:

Predicted Fathead minnow LC50 (96 hr) for 95-48-7 from Consensus method

Prediction results

Endpoint	Experimental value (CAS= 95-48-7) Source: ECOTOX	Predicted value[a]
Fathead minnow LC_{50} (96 hr) -Log10(mol/L)	3.89	3.46
Fathead minnow LC_{50} (96 hr) mg/L	14.00	37.82

[a]Note: the test chemical was present in the training set. The prediction *does not* represent an external prediction.

Predicted Daphnia magna LC50 (48 hr) for 95-48-7 from Consensus method

Prediction results

Endpoint	Experimental value (CAS= 95-48-7) Source: ECOTOX	Predicted value[a]
Daphnia magna LC_{50} (48 hr) -Log10(mol/L)	3.86	4.05
Daphnia magna LC_{50} (48 hr) mg/L	14.83	9.67

[a]Note: the test chemical was present in the training set. The prediction *does not* represent an external prediction.

Predicted T. pyriformis IGC50 (48 hr) for 95-48-7 from Consensus method

Prediction results

Endpoint	Experimental value (CAS= 95-48-7) Source: TETRATOX	Predicted value[a]
T. pyriformis IGC_{50} (48 hr) -Log10(mol/L)	2.71	2.91
T. pyriformis IGC_{50} (48 hr) mg/L	210.88	133.69

[a]Note: the test chemical was present in the training set. The prediction *does not* represent an external prediction.

The lowest LC50 result from T.E.S.T. was 14 mg/L, for the *Fathead Minnow*, calculated via the US EPA's large ECOTOX database. Applying a reduction factor of 1,000 to this figure, as per section 8.3.4.5, yields:

ECL2 = 14 mg/L / 1,000 = 0.014 mg/L = 14 ug/L

Summary of the ECLs yields:

- ECL1: 12 ug/L (chronic data)
- ECL2: 14 ug/L (acute data)

The above ECLs are in very good agreement, even though the data sets are of a different nature (chronic and acute).

As none of the datasets are particularly relevant to Prospect Creek, the average of the results will be taken: 13 ug/L

The proposed low-reliability trigger for 2-Methylphenol is: 13 ug/L.

3-Methyphenol (3-Cresol, Meta-cresol, m-cresol; CAS 108-39-4), and 4-Methyphenol (4-Cresol, Para-cresol, p-cresol; CAS 106-44-5) - Development of an ECL, or Low-Reliability Trigger

From: http://www.inchem.org/documents/sids/sids/m-p-cresols.pdf:

“m-Cresol, p-cresol and mixtures of both isomers can be considered as a single category because of their similarity in physico-chemical properties, distribution between environmental compartments, degradation, ecotoxicity, and toxicology. “

The above linked document calculated a PNEC of 100 ug/L for 3-Methylphenol / 4-Methylphenol, based on NOEC data for fish, invertebrates and alage. This method uses a reduction factor of 10 to the most sensitive result (1 mg/L NOEC for *Daphnia Magna*) and is very similar to the ECL method discussed in section 8.3.4.5. The difference, however, is that section 8.3.4.5 suggests a factor of 20. If applied, the ECL would be:

ECL1 = 1 mg/L / 20 = 0.05 mg/L = 50 ug/L

The US EPA “T.E.S.T.” ecotoxicity prediction software generated the following results:

Predicted Fathead minnow LC50 (96 hr) for 108-39-4 from Consensus method

Prediction results		
Endpoint	**Experimental value (CAS= 108-39-4) Source: ECOTOX**	**Predicted value**[a]
Fathead minnow LC_{50} (96 hr) -Log10(mol/L)	3.29	3.53
Fathead minnow LC_{50} (96 hr) mg/L	55.85	31.56

[a]Note: the test chemical was present in the training set. The prediction *does not* represent an external prediction.

Predicted Daphnia magna LC50 (48 hr) for 108-39-4 from Consensus method

Prediction results		
Endpoint	**Experimental value (CAS= 108-39-4) Source: ECOTOX**	**Predicted value**[a]
Daphnia magna LC_{50} (48 hr) -Log10(mol/L)	3.76	4.01
Daphnia magna LC_{50} (48 hr) mg/L	18.79	10.55

[a]Note: the test chemical was present in the external test set.

Predicted T. pyriformis IGC50 (48 hr) for 108-39-4 from Consensus method

Prediction results

Endpoint	Experimental value (CAS= 108-39-4) Source: TETRATOX	Predicted value[a]
T. pyriformis IGC$_{50}$ (48 hr) -Log10(mol/L)	2.92	3.02
T. pyriformis IGC$_{50}$ (48 hr) mg/L	130.02	103.07

[a] Note: the test chemical was present in the training set. The prediction *does not* represent an external prediction.

The lowest LC50 result from T.E.S.T. was 18.79 mg/L, for the *Daphnia Magna*, calculated via the US EPA's large ECOTOX database. Applying a reduction factor of 1,000 to this figure, as per section 8.3.4.5, yields:

ECL2 = 18.79 mg/L / 1,000 ~ 0.0188 mg/L ~ 19 ug/L

Summary of the ECLs yields:

- ECL1: 50 ug/L
- ECL2: 19 ug/L

The above ECLs are in general agreement for the purposes of ECL development. The average of these results will be taken: ~35 ug/L. This figure is roughly consistent with the proposed trigger for 2-Methylphenol (13 ug/L), and similar toxicity should reasonably be expected.

The proposed low-reliability trigger for 3-Methylphenol / 4-Methylphenol is: 35 ug/L.

Styrene (CAS 100-42-5) - Development of an ECL, or Low-Reliability Trigger

The ANZECC Guidelines provide no guidance on this specie, other than generally in section 8.3.4.5.

The US EPA "T.E.S.T." ecotoxicity prediction software generated the following results:

Predicted Fathead minnow LC50 (96 hr) for 100-42-5 from Consensus method

Prediction results		
Endpoint	**Experimental value (CAS= 100-42-5) Source: ECOTOX**	**Predicted value[a]**
Fathead minnow LC_{50} (96 hr) -Log10(mol/L)	3.79	4.14
Fathead minnow LC_{50} (96 hr) mg/L	17.05	7.51

[a]Note: the test chemical was present in the training set. The prediction *does not* represent an external prediction.

Predicted Daphnia magna LC50 (48 hr) for 100-42-5 from Consensus method

Prediction results		
Endpoint	**Experimental value (CAS= 100-42-5) Source: ECOTOX**	**Predicted value[a]**
Daphnia magna LC_{50} (48 hr) -Log10(mol/L)	3.53	3.77
Daphnia magna LC_{50} (48 hr) mg/L	30.53	17.73

[a]Note: the test chemical was present in the training set. The prediction *does not* represent an external prediction.

Predicted T. pyriformis IGC50 (48 hr) for 100-42-5 from Consensus method

Prediction results		
Endpoint	**Experimental value (CAS= 100-42-5) Source: TETRATOX**	**Predicted value[a]**
T. pyriformis IGC_{50} (48 hr) -Log10(mol/L)	2.98	3.15
T. pyriformis IGC_{50} (48 hr) mg/L	109.07	73.08

[a]Note: the test chemical was present in the training set. The prediction *does not* represent an external prediction.

The lowest LC50 result from T.E.S.T. was 17.05 mg/L, for the *Fathead Minnow*, calculated via the US EPA's large ECOTOX database. Applying a reduction factor of 1,000 to this figure, as per section 8.3.4.5, yields:

ECL1 = 17.05 mg/L / 1,000 ~ 0.017 mg/L = 17 ug/L

The proposed low-reliability trigger for Styrene is: 17 ug/L.

Bromodichloromethane (CAS 75-27-4) - Development of an ECL, or Low-Reliability Trigger

The US EPA “T.E.S.T.” ecotoxicity prediction software generated the following results:

Predicted Fathead minnow LC50 (96 hr) for 75-27-4 from Consensus method

Prediction results		
Endpoint	**Experimental value**	**Predicted value**
Fathead minnow LC_{50} (96 hr) -Log10(mol/L)	N/A	3.40
Fathead minnow LC_{50} (96 hr) mg/L	N/A	65.46

Predicted Daphnia magna LC50 (48 hr) for 75-27-4 from Consensus method

Prediction results		
Endpoint	**Experimental value**	**Predicted value**
Daphnia magna LC_{50} (48 hr) -Log10(mol/L)	N/A	3.52
Daphnia magna LC_{50} (48 hr) mg/L	N/A	49.70

Predicted T. pyriformis IGC50 (48 hr) for 75-27-4 from Consensus method

Prediction results		
Endpoint	**Experimental value**	**Predicted value**
T. pyriformis IGC_{50} (48 hr) -Log10(mol/L)	N/A	3.87
T. pyriformis IGC_{50} (48 hr) mg/L	N/A	22.13

The above result for the IGC50 of T. piriformis is lower than the predicted LC50s for the Minnow and Daphnia – the ICG50 only refers to a growth effect, rather than the Lethal effects of the LC50s. This implies that species such as the T. pyriformis would likely have an LC50 lower than the predicted ICG50, and even lower again the LC50s for the Daphnia and Minnow.

As a result, and in the interest of selecting a conservative low-reliability trigger, we propose the following ECL, using a reduction factor of 1,000 for the ICG50 figure for T. pyriformis, instead of to the Daphnia Magna LC50 figure of 49.7 mg/L (as is otherwise required in section 8.3.4.5):

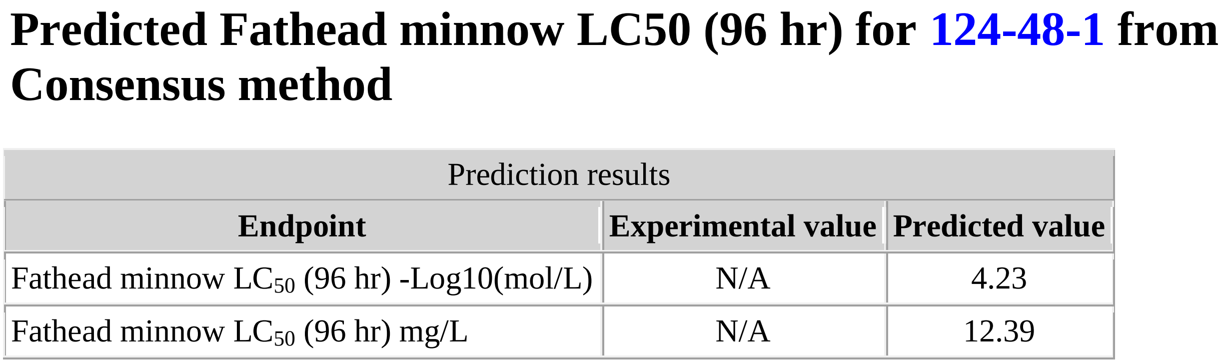
ECL = 22.13 mg/L / 1,000 = 0.02213 ~ 22 ug/L

This ECL is an order of magnitude lower than the Chloroform trigger (370 ug/L), another Trihalomethane, which would be expected to have a somewhat similar toxicity; this helps to confirm the conservative status of this figure, but also that this figure should be considered preliminary.

The proposed low-reliability trigger for Bromodichloromethane is: 22 ug/L.

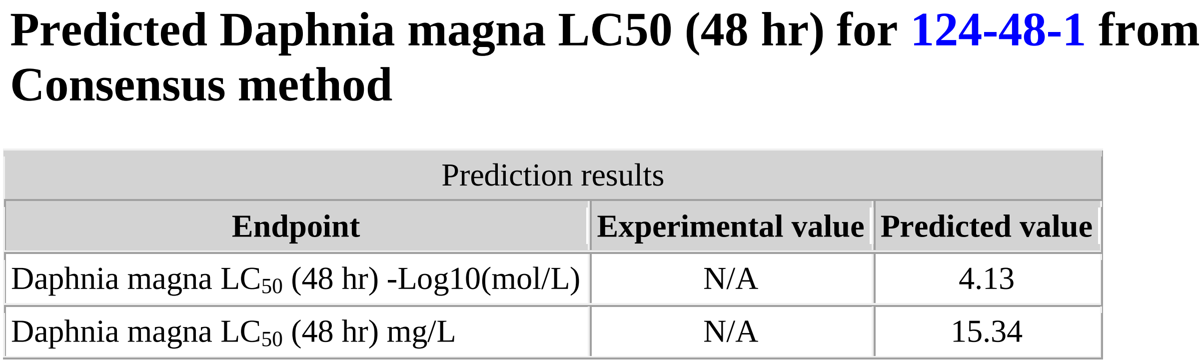
Bromodichloromethane (CAS 124-48-1) - Development of an ECL, or Low-Reliability Trigger

The US EPA “T.E.S.T.” ecotoxicity prediction software generated the following results:



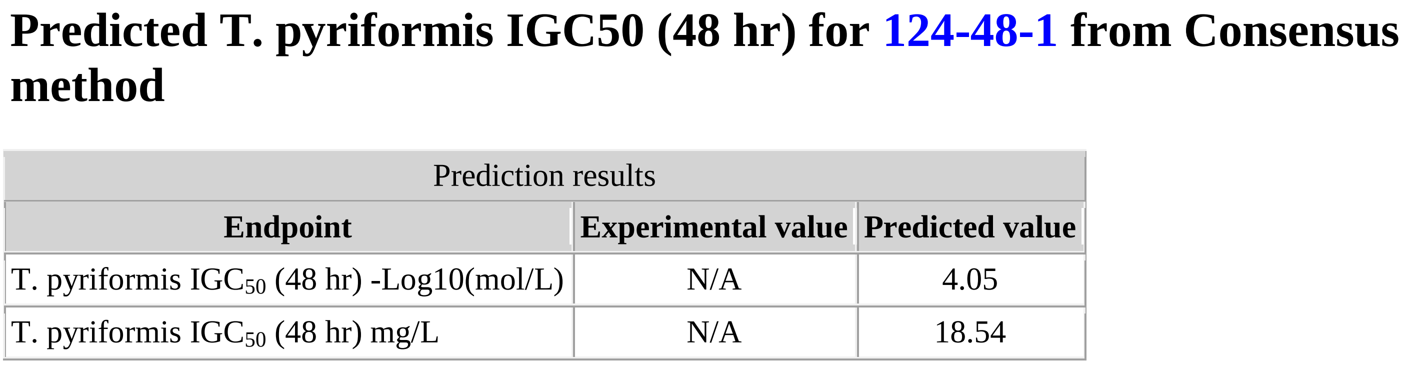
Predicted Fathead minnow LC50 (96 hr) for 124-48-1 from Consensus method

Prediction results		
Endpoint	**Experimental value**	**Predicted value**
Fathead minnow LC_{50} (96 hr) -Log10(mol/L)	N/A	4.23
Fathead minnow LC_{50} (96 hr) mg/L	N/A	12.39



Predicted Daphnia magna LC50 (48 hr) for 124-48-1 from Consensus method

Prediction results		
Endpoint	**Experimental value**	**Predicted value**
Daphnia magna LC_{50} (48 hr) -Log10(mol/L)	N/A	4.13
Daphnia magna LC_{50} (48 hr) mg/L	N/A	15.34



Predicted T. pyriformis IGC50 (48 hr) for 124-48-1 from Consensus method

Prediction results		
Endpoint	**Experimental value**	**Predicted value**
T. pyriformis IGC_{50} (48 hr) -Log10(mol/L)	N/A	4.05
T. pyriformis IGC_{50} (48 hr) mg/L	N/A	18.54

In accordance with section 8.3.4.5, the ECL will be calculated from the predicted Fathead Minnow LC50, and a reduction factor of 1,000 applied:

ECL = 12.39 mg/L / 1,000 = 0.01239 mg/L ~12 ug/L

This figure is consistent with the proposed trigger for Bromodichlorimethane (22 ug/L), and is far more conservative than the proposed trigger for Chloroform (370 ug/L).

The proposed low-reliability trigger for Dibromochloromethane is: 12 ug/L.

Benomyl (CAS 17804-35-2) - Development of an ECL, or Low-Reliability Trigger

The US EPA “T.E.S.T.” ecotoxicity prediction software generated the following results:

Predicted Fathead minnow LC50 (96 hr) for 17804-35-2 from Consensus method

Prediction results		
Endpoint	**Experimental value (CAS= 17804-35-2) Source: ECOTOX**	**Predicted value[a]**
Fathead minnow LC$_{50}$ (96 hr) -Log10(mol/L)	5.18	5.19
Fathead minnow LC$_{50}$ (96 hr) mg/L	1.90	1.89

[a] Note: the test chemical was present in the external test set.

Predicted Daphnia magna LC50 (48 hr) for 17804-35-2 from Consensus method

Prediction results		
Endpoint	**Experimental value**	**Predicted value**
Daphnia magna LC$_{50}$ (48 hr) -Log10(mol/L)	N/A	5.12
Daphnia magna LC$_{50}$ (48 hr) mg/L	N/A	2.22

Predicted T. pyriformis IGC50 (48 hr) for 17804-35-2 from Consensus method

Prediction results		
Endpoint	**Experimental value**	**Predicted value[b]**
T. pyriformis IGC$_{50}$ (48 hr) -Log10(mol/L)	N/A	N/A
T. pyriformis IGC$_{50}$ (48 hr) mg/L	N/A	N/A

[b] The consensus prediction for this chemical is considered unreliable since only one prediction can only be made

If the LC50 for the Fathead Minnow is selected, then the following ECL can be calculated, using a reduction factor of 1,000:

ECL1 = 1.9 mg/L / 1,000 = 0.0019 mg/L = 1.9 ug/L

The following link produced the following relevant data (some of which was sourced from the US EPA

Ecotox database, as used in the determination of ECL1): http://sitem.herts.ac.uk/aeru/ppdb/en/Reports/66.htm. In accordance with section 8.3.4.5, the following data were considered relevant:

- Fish, LC50 (acute, 96-hour): 0.17 mg/L.
- Aquatic Invertebrate, EC50 (acute, 48-hour): 0.28 mg/L.
- Aquatic crustacean, LC50 (acute, 96-hour): 0.14 mg/L.

The LC50 for the crustacean is the lowest result, at 0.14 mg/L. In accordance with section 8.3.4.5, a reduction factor of 100 can be applied:

ECL2 = 0.14 mg/L / 100 = 0.0014 mg/L = 1.4 ug/L

This figure is consistent with ECL1.

As a result, the average of the two figures will be taken: ~1.65 ug/L (compatible with the ALS LOR of 0.01 ug/L).

The proposed low-reliability trigger for Benomyl is: 1.65 ug/L.

Carbendazim (CAS 10605-21-7) - Development of an ECL, or Low-Reliability Trigger

The US EPA “T.E.S.T.” ecotoxicity prediction software generated the following results:

Predicted Fathead minnow LC50 (96 hr) for 10605-21-7 from Consensus method

Prediction results		
Endpoint	**Experimental value**	**Predicted value**
Fathead minnow LC_{50} (96 hr) -Log10(mol/L)	N/A	4.33
Fathead minnow LC_{50} (96 hr) mg/L	N/A	8.98

Predicted Daphnia magna LC50 (48 hr) for 10605-21-7 from Consensus method

Prediction results		
Endpoint	**Experimental value (CAS= 10605-21-7)** **Source: ECOTOX**	**Predicted value**[a]
Daphnia magna LC_{50} (48 hr) -Log10(mol/L)	6.12	5.23
Daphnia magna LC_{50} (48 hr) mg/L	0.15	1.13

Predicted T. pyriformis IGC50 (48 hr) for 10605-21-7 from Consensus method

Prediction results		
Endpoint	**Experimental value**	**Predicted value**[b]
T. pyriformis IGC_{50} (48 hr) -Log10(mol/L)	N/A	N/A
T. pyriformis IGC_{50} (48 hr) mg/L	N/A	N/A

[b] The consensus prediction for this chemical is considered unreliable since only one prediction can only be made

From the above, predictions, an ECL can be developed on the result of Daphnia Magna, in accordance with section 8.3.4.5, with a reduction factor of 1,000:

ECL1 = 0.15 mg/L / 1,000 = 0.00015 mg/L = 0.15 ug/L

The following link produced the following relevant data (some of which was sourced from the US EPA Ecotox database, as used in the determination of ECL1):

http://sitem.herts.ac.uk/aeru/ppdb/en/Reports/116.htm. In accordance with section 8.3.4.5, the following data were considered relevant:

- Fish, LC50 (acute, 96-hour): 0.19 mg/L.
- Aquatic Invertebrate, EC50 (acute, 48-hour): 0.15 mg/L.
- Aquatic crustacean, LC50 (acute, 96-hour): 0.086 mg/L.

The LC50 for the crustacean is the lowest result, at 0.086 mg/L. In accordance with section 8.3.4.5, a reduction factor of 100 can be applied:

ECL2 = 0.086 mg/L / 100 = 0.00086 mg/L = 0.86 ug/L

This figure is consistent with ECL1.

As a result, the average of ECL1 and ECL2 will be taken: ~0.50 ug/L (compatible with the ALS LOR of 0.1 ug/L).

The proposed low-reliability trigger for Carbendazim is: 0.50 ug/L.

Irgarol (CAS 28159-98-0) - Development of an ECL, or Low-Reliability Trigger

The US EPA "T.E.S.T." ecotoxicity prediction software generated the following results:

Predicted Fathead minnow LC50 (96 hr) for 28159-98-0 from Consensus method

Prediction results		
Endpoint	**Experimental value**	**Predicted value**
Fathead minnow LC_{50} (96 hr) -Log10(mol/L)	N/A	4.81
Fathead minnow LC_{50} (96 hr) mg/L	N/A	3.95

Predicted Daphnia magna LC50 (48 hr) for 28159-98-0 from Consensus method

Prediction results		
Endpoint	**Experimental value (CAS= 28159-98-0)** **Source: ECOTOX**	**Predicted value**[a]
Daphnia magna LC_{50} (48 hr) -Log10(mol/L)	4.49	4.47
Daphnia magna LC_{50} (48 hr) mg/L	8.30	8.61

[a] Note: the test chemical was present in the training set. The prediction *does not* represent an external prediction.

Predicted T. pyriformis IGC50 (48 hr) for 28159-98-0 from Consensus method

Prediction results		
Endpoint	**Experimental value**	**Predicted value**[b]
T. pyriformis IGC_{50} (48 hr) -Log10(mol/L)	N/A	N/A
T. pyriformis IGC_{50} (48 hr) mg/L	N/A	N/A

[b] The consensus prediction for this chemical is considered unreliable since only one prediction can only be made

From the above predictions, the experimentally-derived LC50 for Daphnia Magna is the most reliable, at 8.3 mg/L. Applying a reduction factor of 1,000, in accordance with section 8.3.4.5, yields the following ECL:

ECL = 8.3 mg/L / 1,000 = 0.0083 mg/L = 8.3 ug/L

The proposed low-reliability trigger for Irgarol is: 8.3 ug/L.

Metalochlor (CAS 51218-45-2) - Development of an ECL, or Low-Reliability Trigger

The US EPA "T.E.S.T." ecotoxicity prediction software generated the following results:

Predicted Fathead minnow LC50 (96 hr) for 51218-45-2 from Consensus method

Prediction results		
Endpoint	**Experimental value (CAS= 51218-45-2) Source: ECOTOX**	**Predicted value[a]**
Fathead minnow LC$_{50}$ (96 hr) -Log10(mol/L)	4.54	4.77
Fathead minnow LC$_{50}$ (96 hr) mg/L	8.20	4.85

[a] Note: the test chemical was present in the training set. The prediction *does not* represent an external prediction.

Predicted Daphnia magna LC50 (48 hr) for 51218-45-2 from Consensus method

Prediction results		
Endpoint	**Experimental value (CAS= 51218-45-2) Source: ECOTOX**	**Predicted value[a]**
Daphnia magna LC$_{50}$ (48 hr) -Log10(mol/L)	4.34	4.61
Daphnia magna LC$_{50}$ (48 hr) mg/L	13.00	7.03

[a] Note: the test chemical was present in the external test set.

Predicted T. pyriformis IGC50 (48 hr) for 51218-45-2 from Consensus method

Prediction results		
Endpoint	**Experimental value**	**Predicted value**
T. pyriformis IGC$_{50}$ (48 hr) -Log10(mol/L)	N/A	4.48
T. pyriformis IGC$_{50}$ (48 hr) mg/L	N/A	9.45

From the above predictions, the experimentally-derived LC50 for the Fathead Minnow is the most appropriate, at 8.2 mg/L. Applying a reduction factor of 1,000, in accordance with section 8.3.4.5, yields the following ECL:

ECL = 8.2 mg/L / 1,000 = 0.0082 mg/L = 8.2 ug/L

The proposed low-reliability trigger for Metalochlor is: 8.2 ug/L.

4-Nonylphenol (CAS 104-40-5) - Development of an ECL, or Low-Reliability Trigger

The US EPA "T.E.S.T." ecotoxicity prediction software generated the following results:

Predicted Fathead minnow LC50 (96 hr) for 104-40-5 from Consensus method

Prediction results		
Endpoint	**Experimental value (CAS= 104-40-5) Source: ECOTOX**	**Predicted value[a]**
Fathead minnow LC_{50} (96 hr) -Log10(mol/L)	5.91	5.63
Fathead minnow LC_{50} (96 hr) mg/L	0.27	0.51

[a]Note: the test chemical was present in the training set. The prediction *does not* represent an external prediction.

Predicted Daphnia magna LC50 (48 hr) for 104-40-5 from Consensus method

Prediction results		
Endpoint	**Experimental value (CAS= 104-40-5) Source: ECOTOX**	**Predicted value[a]**
Daphnia magna LC_{50} (48 hr) -Log10(mol/L)	6.06	5.73
Daphnia magna LC_{50} (48 hr) mg/L	0.19	0.41

[a]Note: the test chemical was present in the training set. The prediction *does not* represent an external prediction.

Predicted T. pyriformis IGC50 (48 hr) for 104-40-5 from Consensus method

Prediction results		
Endpoint	**Experimental value (CAS= 104-40-5) Source: TETRATOX**	**Predicted value[a]**
T. pyriformis IGC_{50} (48 hr) -Log10(mol/L)	5.47	5.61
T. pyriformis IGC_{50} (48 hr) mg/L	0.75	0.54

[a]Note: the test chemical was present in the training set. The prediction *does not* represent an external prediction.

From the above predictions, the experimentally-derived LC50 for the Daphnia Magna is the most appropriate, at 0.19 mg/L. Applying a reduction factor of 1,000, in accordance with section 8.3.4.5, yields the following ECL:

ECL = 0.19 mg/L / 1,000 = 0.00019 mg/L = 0.19 ug/L

The proposed low-reliability trigger for 4-Nonylphenol is: 0.19 ug/L.

4-Chloro-3-methylphenol (p-Chlorocresol; CAS 59-50-7) - Development of an ECL, or Low-Reliability Trigger

The US EPA "T.E.S.T." ecotoxicity prediction software generated the following results:

Predicted Fathead minnow LC50 (96 hr) for 59-50-7 from Consensus method

Prediction results		
Endpoint	**Experimental value (CAS= 59-50-7)** **Source: ECOTOX**	**Predicted value**[a]
Fathead minnow LC_{50} (96 hr) -Log10(mol/L)	4.42	4.24
Fathead minnow LC_{50} (96 hr) mg/L	5.47	8.16

[a]Note: the test chemical was present in the training set. The prediction *does not* represent an external prediction.

Predicted Daphnia magna LC50 (48 hr) for 59-50-7 from Consensus method

Prediction results		
Endpoint	**Experimental value (CAS= 59-50-7)** **Source: ECOTOX**	**Predicted value**[a]
Daphnia magna LC_{50} (48 hr) -Log10(mol/L)	4.85	4.91
Daphnia magna LC_{50} (48 hr) mg/L	2.00	1.76

[a]Note: the test chemical was present in the training set. The prediction *does not* represent an external prediction.

Predicted T. pyriformis IGC50 (48 hr) for 59-50-7 from Consensus method

Prediction results		
Endpoint	**Experimental value (CAS= 59-50-7)** **Source: TETRATOX**	**Predicted value**[a]
T. pyriformis IGC_{50} (48 hr) -Log10(mol/L)	3.80	3.78
T. pyriformis IGC_{50} (48 hr) mg/L	22.60	23.51

[a]Note: the test chemical was present in the training set. The prediction *does not* represent an external prediction.

From the above predictions, the experimentally-derived LC50 for the Daphnia Magna is the most appropriate, at 2.0 mg/L. Applying a reduction factor of 1,000, in accordance with section 8.3.4.5, yields the following ECL:

ECL = 2.0 mg/L / 1,000 = 0.002 mg/L = 2 ug/L

The proposed low-reliability trigger for 4-Chloro-3-methylphenol is: 2 ug/L.

Dalapon (CAS 75-99-0) - Development of an ECL, or Low-Reliability Trigger

The US EPA "T.E.S.T." ecotoxicity prediction software generated the following results:

Predicted Fathead minnow LC50 (96 hr) for 75-99-0 from Consensus method

Prediction results		
Endpoint	**Experimental value (CAS= 75-99-0) Source: ECOTOX**	**Predicted value[a]**
Fathead minnow LC$_{50}$ (96 hr) -Log10(mol/L)	2.69	2.49
Fathead minnow LC$_{50}$ (96 hr) mg/L	289.90	462.99

[a] Note: the test chemical was present in the training set. The prediction *does not* represent an external prediction.

Predicted Daphnia magna LC50 (48 hr) for 75-99-0 from Consensus method

Prediction results		
Endpoint	**Experimental value**	**Predicted value**
Daphnia magna LC$_{50}$ (48 hr) -Log10(mol/L)	N/A	3.51
Daphnia magna LC$_{50}$ (48 hr) mg/L	N/A	44.40

Predicted T. pyriformis IGC50 (48 hr) for 75-99-0 from Consensus method

Prediction results		
Endpoint	**Experimental value**	**Predicted value**
T. pyriformis IGC$_{50}$ (48 hr) -Log10(mol/L)	N/A	2.95
T. pyriformis IGC$_{50}$ (48 hr) mg/L	N/A	159.72

From the above predictions, the experimentally-derived LC50 for the Daphnia Magna is the most appropriate, at 289.9 mg/L. Applying a reduction factor of 1,000, in accordance with section 8.3.4.5, yields the following ECL:

ECL = 289.9 mg/L / 1,000 = 0.2899 mg/L ~ 290 ug/L

This figure is consistent with the assessment in the following link of "Not acutely toxic" for Aquatic species:

http://www.pesticideinfo.org/Detail_Chemical.jsp?Rec_Id=PC33431#Ecotoxicity

However, this figure is two (2) orders of magnitude greater than the Irrigation Guideline limit provided in Table 4.2.12, of 4 ug/L. Hence, as Dalapon is a highly selective herbicide, and in the interest of choosing conservative triggers, we select the irrigation guideline over the aquatic toxicity ECL.

The proposed low-reliability trigger for Dalapon is: 4 ug/L.

Bisphenol-A (CAS 80-05-7) - Development of an ECL, or Low-Reliability Trigger

The US EPA “T.E.S.T.” ecotoxicity prediction software generated the following results:

Predicted Fathead minnow LC50 (96 hr) for 80-05-7 from Consensus method

Prediction results		
Endpoint	**Experimental value (CAS= 80-05-7) Source: ECOTOX**	**Predicted value**[a]
Fathead minnow LC$_{50}$ (96 hr) -Log10(mol/L)	4.69	4.88
Fathead minnow LC$_{50}$ (96 hr) mg/L	4.65	3.01

[a] Note: the test chemical was present in the training set. The prediction *does not* represent an external prediction.

Predicted Daphnia magna LC50 (48 hr) for 80-05-7 from Consensus method

Prediction results		
Endpoint	**Experimental value (CAS= 80-05-7) Source: ECOTOX**	**Predicted value**[a]
Daphnia magna LC$_{50}$ (48 hr) -Log10(mol/L)	4.30	5.12
Daphnia magna LC$_{50}$ (48 hr) mg/L	11.42	1.73

[a] Note: the test chemical was present in the training set. The prediction *does not* represent an external prediction.

Predicted T. pyriformis IGC50 (48 hr) for 80-05-7 from Consensus method

Prediction results		
Endpoint	**Experimental value**	**Predicted value**
T. pyriformis IGC$_{50}$ (48 hr) -Log10(mol/L)	N/A	4.61
T. pyriformis IGC$_{50}$ (48 hr) mg/L	N/A	5.57

From the above predictions, the experimentally-derived LC50 for the Fathead Minnow is the most appropriate, at 4.65 mg/L. Applying a reduction factor of 1,000, in accordance with section 8.3.4.5, yields the following ECL:

ECL = 4.65 mg/L / 1,000 = 0.00465 mg/L ~ 4.7 ug/L

The proposed low-reliability trigger for Bisphenol-A is: 4.7 ug/L.

Cyromazine (CAS 66215-27-8) - Development of an ECL, or Low-Reliability Trigger

The US EPA "T.E.S.T." ecotoxicity prediction software generated the following results:

Predicted Fathead minnow LC50 (96 hr) for 66215-27-8 from Consensus method

Prediction results		
Endpoint	**Experimental value**	**Predicted value**
Fathead minnow LC_{50} (96 hr) -Log10(mol/L)	N/A	3.29
Fathead minnow LC_{50} (96 hr) mg/L	N/A	84.38

Predicted Daphnia magna LC50 (48 hr) for 66215-27-8 from Consensus method

Prediction results		
Endpoint	**Experimental value**	**Predicted value**
Daphnia magna LC_{50} (48 hr) -Log10(mol/L)	N/A	3.20
Daphnia magna LC_{50} (48 hr) mg/L	N/A	103.78

Predicted T. pyriformis IGC50 (48 hr) for 66215-27-8 from Consensus method

Prediction results		
Endpoint	**Experimental value**	**Predicted value**
T. pyriformis IGC_{50} (48 hr) -Log10(mol/L)	N/A	2.40
T. pyriformis IGC_{50} (48 hr) mg/L	N/A	657.27

From the above predictions, the predicted value for the Fathead Minnow is the most appropriate, at 84.38 mg/L – though none of the figures are of a high quality. Nonetheless, applying a reduction factor of 1,000, in accordance with section 8.3.4.5, yields the following ECL:

ECL = 84.38 mg/L / 1,000 = 0.08438 mg/L ~ 84 ug/L

The proposed low-reliability trigger for Cyromazine is: 84 ug/L.

Thiamethoxam (CAS 153719-23-4) - Development of an ECL, or Low-Reliability Trigger

The following document produced the following LC50 data (24-96hr, Aquatic Insect: Hemiptera; geometric mean): 44.8 ug/L: http://pollinatorstewardship.org/wp-content/uploads/2014/12/Morrissey-et-al-2015_Review-neonicotinoids-surface-water-risk-to-aquatic-invertebrates.pdf . Applying a reduction factor of 1,000, as per section 8.3.4.5 produces the following ECL:

ECL1 = 44.8 ug/L / 1,000 = 0.0448 ug/L ~0.05 ug/L

The following link produced a minimum 96-hour LC50 for the Red Swamp Crayfish of 879 ug/L http://www.pesticideinfo.org/List_AquireAll.jsp?Rec_Id=PC36879 . Applying section 8.3.4.5 with a reduction factor of 1,000 yields:

ECL2 = 879 ug/L / 1,000 = 0.879 ug/L

The following link produced a higher-quality range of data: https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OPP-2011-0581-0003&contentType=pdf . Table 4.1 yielded the following results of interest for the Midge:

- 48-hour EC50: 35 ug/L; and,
- NOAEC: 13 ug/L.

The above data are in general agreement, despite being different in nature. The dataset appear to satisfy section 8.3.4.5 for the application of a reduction factor of 100 to the EC50 data point:

ECL3 = 35 ug/L / 100 = 0.35 ug/L

The following link featured a good quality dataset (pages 32 and 33), with the most result, as per section 8.3.4.5, being an invertebrate EC50 of 0.014 mg/L: https://www.google.com.au/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&cad=rja&uact=8&ved=0ahUKEwj027H-jf_SAhWEXbwKHZaRAT0QFggzMAM&url=https%3A%2F%2Fwww.nrdc.org%2Ffile%2F2899%2Fdownload%3Ftoken%3DjyPb1BrS&usg=AFQjCNGiKpo-tLlv9itj6fE9N8oxmy0s0A&sig2=OaKxKkVsB4el_xl1F2-5Sg

Applying section 8.3.4.5, with a reduction factor of 100, yields:

ECL4 = 0.014 mg/L / 100 = 0.00014 mg/L = 0.14 ug/L

Literature makes it clear that the primary action of Thiamethoxam is as an insecticide, often exhibiting significantly greater toxicological effects on insects than on non-insects; this will be taken into account when proposing a ECL / low-reliability trigger.

The ECLS are summarised below:

- ECL1: 0.05 ug/L (aquatic insect, low-quality dataset);
- ECL2: 0.879 ug/L (crayfish, low-quality dataset);

- ECL3: 0.35 ug/L (insect, good quality dataset);
- ECL4: 0.14 ug/L (invertebrate, good quality dataset).

ECLs 3 and 4 have the best balance of quality sources and derivation, agreement and conservatism; ECL1 is very conservative, was derived from a low-quality source, and has a low-quality derivation; ECL2 is from a low-quality source, even though it does somewhat agree with ECLs 3 and 4. As a result, we propose the average of ECLs 3 and 4: ~0.25 ug/L

The proposed low-reliability trigger for Thiamethoxam is: 0.25 ug/L.

Appendix C

Exhaustive List of Analytes and Associated Limits of Reporting (LOR)

Table C1

Analyte grouping/Analyte	**CAS Number**	**Units**	**LOR**
EA005P: pH by PC Titrator			
pH Value		pH Unit	0.01
EA010P: Conductivity by PC Titrator			
Electrical Conductivity @ 25°C		µS/cm	1
EA025: Total Suspended Solids dried at 104 ± 2°C			
Total Suspended Solids (TSS)		mg/L	5
EA045: Turbidity			
Turbidity		NTU	0.1
EA075: Redox Potential			
Redox Potential		%	0.1
pH Redox		pH Unit	0.01
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA			
Sulfate as SO4 - Turbidimetric	14808-79-8	mg/L	1
ED045G: Chloride by Discrete Analyser			
Chloride	16887-00-6	mg/L	1
ED093F: Dissolved Major Cations			
Calcium	7440-70-2	mg/L	1
Magnesium	7439-95-4	mg/L	1
Sodium	7440-23-5	mg/L	1
Potassium	7/09/7440	mg/L	1
EG020F: Dissolved Metals by ICP-MS			
Gallium	7440-55-3	mg/L	0.001
Lanthanum	7439-91-0	mg/L	0.001
EG035F: Dissolved Mercury by FIMS			
Mercury	7439-97-6	mg/L	0.00004
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level			
Hexavalent Chromium	18540-29-9	mg/L	0.001
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS			
Aluminium	7429-90-5	µg/L	5
Antimony	7440-36-0	µg/L	0.5
Arsenic	7440-38-2	µg/L	0.5
Barium	7440-39-3	µg/L	1
Beryllium	7440-41-7	µg/L	0.1
Bismuth	7440-69-9	µg/L	0.1
Boron	7440-42-8	µg/L	100
Cadmium	7440-43-9	µg/L	0.2
Chromium	7440-47-3	µg/L	0.5
Cobalt	7440-48-4	µg/L	0.2
Copper	7440-50-8	µg/L	1
Iron	7439-89-6	µg/L	5
Lead	7439-92-1	µg/L	0.2
Manganese	7439-96-5	µg/L	0.5
Molybdenum	7439-98-7	µg/L	0.1
Nickel	7440-02-0	µg/L	0.5
Selenium	7782-49-2	µg/L	2
Silver	7440-22-4	µg/L	0.1
Strontium	7440-24-6	µg/L	10

Thallium	7440-28-0	µg/L	0.1
Tin	7440-31-5	µg/L	5
Uranium	7440-61-1	µg/L	0.1
Vanadium	7440-62-2	µg/L	0.5
Zinc	7440-66-6	µg/L	5
EK010-1: Chlorine			
Total Residual Chlorine		mg/L	0.02
EK025SF: Free CN by Segmented Flow Analyser			
Free Cyanide		mg/L	0.004
EK026SF: Total CN by Segmented Flow Analyser			
Total Cyanide	57-12-5	mg/L	0.004
EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser			
Weak Acid Dissociable Cyanide		mg/L	0.004
EK084: Un-ionized Hydrogen Sulfide			
Unionized Hydrogen Sulfide		mg/L	0.1
EK255A: Ammonia			
Ammonia as N	7664-41-7	mg/L	0.005
EK257A: Nitrite			
Nitrite as N	14797-65-0	mg/L	0.002
EK259A: Nitrite and Nitrate (NOx)			
Nitrite + Nitrate as N		mg/L	0.002
EK262A: Total Nitrogen			
Total Nitrogen as N		mg/L	0.01
EK267A: Total Phosphorus (Persulfate Digestion)			
Total Phosphorus as P		mg/L	0.005
EP020: Oil and Grease (O&G)			
Oil & Grease		mg/L	5
EP026SPF: Chemical Oxygen Demand (Spectrophotometric); Filtered			
Chemical Oxygen Demand - Filtered		mg/L	10
EP030F: Biochemical Oxygen Demand (Filtered)			
Biochemical Oxygen Demand (Filtered)		mg/L	2
EP050: Anionic Surfactants as MBAS			
Anionic Surfactants as MBAS		mg/L	0.1
EP075(SIM)A: Phenolic Compounds			
Phenol	108-95-2	µg/L	1
2-Chlorophenol	95-57-8	µg/L	1
2-Methylphenol	95-48-7	µg/L	1
3- & 4-Methylphenol	1319-77-3	µg/L	2
2-Nitrophenol	88-75-5	µg/L	1
2.4-Dimethylphenol	105-67-9	µg/L	1
2.4-Dichlorophenol	120-83-2	µg/L	1
2.6-Dichlorophenol	87-65-0	µg/L	1
4-Chloro-3-methylphenol	59-50-7	µg/L	1
2.4.6-Trichlorophenol	88-06-2	µg/L	1
2.4.5-Trichlorophenol	95-95-4	µg/L	1
Pentachlorophenol	87-86-5	µg/L	2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons			

Naphthalene	91-20-3	µg/L	1
Acenaphthylene	208-96-8	µg/L	1
Acenaphthene	83-32-9	µg/L	1
Fluorene	86-73-7	µg/L	1
Phenanthrene	85-01-8	µg/L	1
Anthracene	120-12-7	µg/L	1
Fluoranthene	206-44-0	µg/L	1
Pyrene	129-00-0	µg/L	1
Benz(a)anthracene	56-55-3	µg/L	1
Chrysene	218-01-9	µg/L	1
Benzo(b+j)fluoranthene	205-99-2 205-82-3	µg/L	1
Benzo(k)fluoranthene	207-08-9	µg/L	1
Benzo(a)pyrene	50-32-8	µg/L	0.5
Indeno(1.2.3.cd)pyrene	193-39-5	µg/L	1
Dibenz(a.h)anthracene	53-70-3	µg/L	1
Benzo(g.h.i)perylene	191-24-2	µg/L	1
EP075C: Phthalate Esters			
Dimethyl phthalate	131-11-3	µg/L	2
Diethyl phthalate	84-66-2	µg/L	2
Di-n-butyl phthalate	84-74-2	µg/L	2
Butyl benzyl phthalate	85-68-7	µg/L	2
bis(2-ethylhexyl) phthalate	117-81-7	µg/L	10
Di-n-octylphthalate	117-84-0	µg/L	2
EP075G: Chlorifluonated Hydrocarbons			
1.4-Dichlorobenzene	106-46-7	µg/L	2
1.3-Dichlorobenzene	541-73-1	µg/L	2
1.2-Dichlorobenzene	95-50-1	µg/L	2
Hexachloroethane	67-72-1	µg/L	2
1.2.4-Trichlorobenzene	120-82-1	µg/L	2
Hexachloropropylene	1888-71-7	µg/L	2
Hexachlorobutadiene	87-68-3	µg/L	2
Hexachlorocyclopentadiene	77-47-4	µg/L	10
Pentachlorobenzene	608-93-5	µg/L	2
Hexachlorobenzene (HCB)	118-74-1	µg/L	4
EP075H: Anilines and Benzidines			
Aniline	62-53-3	µg/L	2
4-Chloroaniline	106-47-8	µg/L	2
2-Nitroaniline	88-74-4	µg/L	4
3-Nitroaniline	99-09-2	µg/L	4
Dibenzofuran	132-64-9	µg/L	2
4-Nitroaniline	100-01-6	µg/L	2
Carbazole	86-74-8	µg/L	2
3.3`-Dichlorobenzidine	91-94-1	µg/L	2
EP080/071: Total Petroleum Hydrocarbons			
C6 - C9 Fraction		µg/L	20
C10 - C14 Fraction		µg/L	50

C15 - C28 Fraction		µg/L	100
C29 - C36 Fraction		µg/L	50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions			
C6 - C10 Fraction	C6_C10	µg/L	20
>C10 - C16 Fraction		µg/L	100
>C16 - C34 Fraction		µg/L	100
>C34 - C40 Fraction		µg/L	100
EP080: BTEXN			
Benzene	71-43-2	µg/L	1
Toluene	108-88-3	µg/L	2
Ethylbenzene	100-41-4	µg/L	2
meta- & para-Xylene	108-38-3 106-42-3	µg/L	2
ortho-Xylene	95-47-6	µg/L	2
Naphthalene	91-20-3	µg/L	5
EP094A: Synthetic Pyrethroids			
Bioresmethrin	28434-01-07	µg/L	0.5
Bifenthrin	82657-04-3	µg/L	0.5
Phenothrin	26002-80-2	µg/L	0.5
Lambda-cyhalothrin	68085-85-8	µg/L	0.5
Permethrin	52645-53-1	µg/L	0.5
Cyfluthrin	68359-37-5	µg/L	0.5
Cypermethrin	52315-07-8	µg/L	0.5
Fenvalverate & Esfenvalerate	51630-58-1/66230-04-	µg/L	0.5
Deltamethrin & Tralomethrin	62229-77-0/66841-25-	µg/L	0.5
Allethrin	584-79-2	µg/L	0.5
Transfluthrin	118712-89-3	µg/L	0.5
Tau-fluvalinate	102851-06-9	µg/L	0.5
Tetramethrin	68085-85-8	µg/L	0.5
EP094B: Synergist			
Piperonyl Butoxide	63993-73-7	µg/L	0.5
EP117: Alcohols			
Ethanol	64-17-5	µg/L	50
Isopropanol	67-63-0	µg/L	50
n-Propanol	71-23-8	µg/L	50
Isobutanol	78-83-1	µg/L	50
n-Butanol	71-36-3	µg/L	50
EP125A: Monocyclic Aromatic Hydrocarbons			
Benzene	71-43-2	µg/L	0.05
Toluene	108-88-3	µg/L	0.5
Ethylbenzene	100-41-4	µg/L	0.05
meta- & para-Xylene	108-38-3 106-42-3	µg/L	0.05
Styrene	100-42-5	µg/L	0.05
ortho-Xylene	95-47-6	µg/L	0.05
1.3.5-Trimethylbenzene	108-67-8	µg/L	0.05
1.2.4-Trimethylbenzene	95-63-6	µg/L	0.05
EP125D: Fumigants			
1.2-Dichloropropane	78-87-5	µg/L	0.1
cis-1.3-Dichloropropylene	10061-01-5	µg/L	0.1
trans-1.3-Dichloropropylene	10061-02-6	µg/L	0.1
1.2-Dibromoethane (EDB)	106-93-4	µg/L	0.1

EP125E: Halogenated Aliphatic Compounds			
Dichlorodifluoromethane	75-71-8	µg/L	0.5
Vinyl chloride	75-01-4	µg/L	0.3
Bromomethane	74-83-9	µg/L	0.5
Chloroethane	75-00-3	µg/L	0.5
Trichlorofluoromethane	75-69-4	µg/L	0.5
1.1-Dichloroethene	75-35-4	µg/L	0.1
Dichloromethane	75-09-2	µg/L	1
trans-1.2-Dichloroethene	156-60-5	µg/L	0.1
1.1-Dichloroethane	75-34-3	µg/L	0.1
cis-1.2-Dichloroethene	156-59-2	µg/L	0.1
Bromochloromethane	74-97-5	µg/L	0.5
1.2-Dichloroethane	107-06-2	µg/L	0.1
1.1.1-Trichloroethane	71-55-6	µg/L	0.1
Carbon Tetrachloride	56-23-5	µg/L	0.05
Trichloroethene	79-01-6	µg/L	0.05
Tetrachloroethene	127-18-4	µg/L	0.05
Hexachlorobutadiene	87-68-3	µg/L	0.04
EP125F: Halogenated Aromatic Compounds			
Chlorobenzene	108-90-7	µg/L	0.1
Bromobenzene	108-86-1	µg/L	0.1
Benzylchloride	100-44-7	µg/L	0.2
1.3-Dichlorobenzene	541-73-1	µg/L	0.1
1.4-Dichlorobenzene	106-46-7	µg/L	0.1
1.2-Dichlorobenzene	95-50-1	µg/L	0.1
2-Chlorotoluene	95-49-8	µg/L	0.1
4-Chlorotoluene	106-43-4	µg/L	0.1
1.2.4-Trichlorobenzene	120-82-1	µg/L	0.1
1.2.3-Trichlorobenzene	87-61-6	µg/L	0.1
EP125G: Trihalomethanes			
Chloroform	67-66-3	µg/L	0.1
Bromodichloromethane	75-27-4	µg/L	0.1
Dibromochloromethane	124-48-1	µg/L	0.1
Bromoform	75-25-2	µg/L	0.1
EP125H: Naphthalene			
Naphthalene	91-20-3	µg/L	0.05
EP125L: Methyl t-butyl ether			
Methyl tert-butyl ether (MTBE)	1634-04-4	µg/L	0.1
EP131A: Organochlorine Pesticides			
Aldrin	309-00-2	µg/L	0.01
alpha-BHC	319-84-6	µg/L	0.01
beta-BHC	319-85-7	µg/L	0.01
delta-BHC	319-86-8	µg/L	0.01
4.4`-DDD	72-54-8	µg/L	0.01
4.4`-DDE	72-55-9	µg/L	0.01

4.4`-DDT	50-29-3	µg/L	0.01
Dieldrin	60-57-1	µg/L	0.01
alpha-Endosulfan	959-98-8	µg/L	0.01
beta-Endosulfan	33213-65-9	µg/L	0.01
Endosulfan sulfate	1031-07-8	µg/L	0.01
Endrin	72-20-8	µg/L	0.01
Endosulfan (sum)	115-29-7	µg/L	0.01
Endrin aldehyde	7421-93-4	µg/L	0.01
Endrin ketone	53494-70-5	µg/L	0.01
Heptachlor	76-44-8	µg/L	0.005
Heptachlor epoxide	1024-57-3	µg/L	0.01
Hexachlorobenzene (HCB)	118-74-1	µg/L	0.01
gamma-BHC	58-89-9	µg/L	0.01
Methoxychlor	72-43-5	µg/L	0.01
cis-Chlordane	5103-71-9	µg/L	0.01
trans-Chlordane	5103-74-2	µg/L	0.01
Total Chlordane (sum)		µg/L	0.01
Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	µg/L	0.01
EP131B: Polychlorinated Biphenyls (as Aroclors)			
Total Polychlorinated biphenyls		µg/L	0.1
EP132C: Chlorinated Naphthalenes			
2-Chloronaphthalene	91-58-7	µg/L	0.1
EP203A: Explosives			
HMX	2691-41-0	µg/L	1
RDX		µg/L	1
1.3.5-Trinitrobenzene	99-35-4	µg/L	1
1.3-Dinitrobenzene	99-65-0	µg/L	1
Tetryl	479-45-8	µg/L	1
2.4.6-TNT	118-96-7	µg/L	1
4-Amino.2.6-DNT	19406-51-0	µg/L	1
2-Amino-4.6-DNT	35572-78-2	µg/L	1
2.4-Dinitrotoluene	121-14-2	µg/L	1
2.6-Dinitrotoluene	606-20-2	µg/L	1
Nitrobenzene	98-95-3	µg/L	1
2-Nitrotoluene	88-72-2	µg/L	1
3-Nitrotoluene	99-08-1	µg/L	1
4-Nitrotoluene	99-99-0	µg/L	1
Nitroglycerine	55-63-0	µg/L	5
PETN	78-11-5	µg/L	5
EP234A: OP Pesticides			
Acephate	30560-19-1	µg/L	0.5
Azinphos-methyl	86-50-0	µg/L	0.02
Azinphos-ethyl	2642-71-9	µg/L	0.02
Bensulide	741-58-2	µg/L	0.1
Bromophos-ethyl	4824-78-6	µg/L	0.1
Carbofenothion	786-19-6	µg/L	0.02
Chlorfenvinphos	470-90-6	µg/L	0.02
Chlorpyrifos	2921-88-2	µg/L	0.02
Chlorpyrifos-methyl	5598-13-0	µg/L	0.2

Coumaphos	56-72-4	µg/L	0.01
Demeton-O	298-03-0	µg/L	0.02
Demeton-O & Demeton-S	298-03-3/126-75-0	µg/L	0.02
Demeton-S	126-75-0	µg/L	0.02
Demeton-S-methyl	919-86-8	µg/L	0.02
Diazinon	333-41-5	µg/L	0.01
Dichlorvos	62-73-7	µg/L	0.2
Dimethoate	60-51-5	µg/L	0.02
Disulfoton	298-04-4	µg/L	0.05
EPN	2104-64-5	µg/L	0.05
Ethion	563-12-2	µg/L	0.02
Ethoprophos	13194-48-4	µg/L	0.01
Fenamiphos	22224-92-6	µg/L	0.01
Fenchlorphos (Ronnel)	299-84-3	µg/L	10
Fenitrothion	122-14-5	µg/L	2
Fensulfothion	115-90-2	µg/L	0.01
Fenthion	55-38-9	µg/L	0.05
Formothion	2540-82-1	µg/L	20
Fosetyl Aluminium	39148-24-8	µg/L	10
Malathion	121-75-5	µg/L	0.02
Methidathion	950-37-8	µg/L	0.1
Mevinphos	7786-34-7	µg/L	0.02
Monocrotophos	6923-22-4	µg/L	0.02
Naftalofos	1491-41-4	µg/L	1
Omethoate	1113-02-6	µg/L	0.01
Parathion	56-38-2	µg/L	0.2
Parathion-methyl	298-00-0	µg/L	0.5
Phorate	298-02-2	µg/L	0.1
Pirimiphos-ethyl	23505-41-1	µg/L	0.01
Pirimiphos-methyl	29232-93-7	µg/L	0.01
Profenofos	41198-08-7	µg/L	0.01
Prothiofos	34643-46-4	µg/L	0.1
Pyrazophos	13457-18-6	µg/L	0.1
Sulfotep	3689-24-5	µg/L	0.005
Sulprofos	35400-43-2	µg/L	0.05
Temephos	3383-96-8	µg/L	0.02
Terbufos	13071-79-9	µg/L	0.01
Tetrachlorvinphos	22248-79-9	µg/L	0.01
Thiometon	640-15-3	µg/L	0.5
Triazophos	24017-47-8	µg/L	0.005
Trichlorfon	52-68-6	µg/L	0.02
Trichloronate	327-98-0	µg/L	0.5
EP234B: Thiocarbamates and Carbamates			
Aldicarb	116-06-3	µg/L	0.05
Bendiocarb	22781-23-3	µg/L	0.1
Benomyl	17804-35-2	µg/L	0.01
Carbaryl	63-25-2	µg/L	0.01
Carbofuran	1563-66-2	µg/L	0.01
3-Hydroxy Carbofuran	16655-82-6	µg/L	0.02
EPTC	759-94-4	µg/L	0.1
Fenoxycarb	79127-80-3	µg/L	0.1
Methiocarb	2032-65-7	µg/L	0.01
Methomyl	16752-77-5	µg/L	0.01
Molinate	2212-67-1	µg/L	0.1
Oxamyl	23135-22-0	µg/L	0.01

Pebulate	1114-71-2	µg/L	0.1
Pirimicarb	23103-98-2	µg/L	0.1
Promecarb	2631-37-0	µg/L	0.1
Propamocarb	24579-73-5	µg/L	0.1
Thiobencarb	28249-77-6	µg/L	0.01
Thiodicarb	59669-26-0	µg/L	0.01
Vernolate	1929-77-7	µg/L	0.1
EP234C: Dinitroanilines			
Nitralin	4726-14-1	µg/L	0.1
Pendimethalin	40487-42-1	µg/L	0.05
Trifluralin	1582-09-8	µg/L	10
EP234D: Triazinone Herbicides			
Hexazinone	51235-04-2	µg/L	0.02
Metribuzin	21087-64-9	µg/L	0.02
EP234E: Conazole and Aminopyrimidine Fungicides			
Cyproconazole	94361-06-5	µg/L	0.02
Difenoconazole	119446-68-3	µg/L	0.02
Flusilazole	85509-19-9	µg/L	0.02
Hexaconazole	79983-71-4	µg/L	0.02
Paclobutrazole	76738-62-0	µg/L	0.05
Myclobutanil	88671-89-0	µg/L	0.1
Penconazole	66246-88-6	µg/L	0.01
Propiconazole	60207-90-1	µg/L	0.05
Tebuconazole	107534-96-3	µg/L	0.01
Cyprodinil	121552-61-2	µg/L	0.01
Pyrimethanil	53112-28-0	µg/L	0.02
Pyroxsulam	422556-08-9	µg/L	0.1
Tetraconazole	112281-77-3	µg/L	0.1
Triadimefon	43121-43-3	µg/L	0.1
Triadimenol	55219-65-3	µg/L	0.1
EP234F: Phenylurea	**Thizdiazolurea**	**Uracil and Sulfonylurea Herbicides**	
Bensulfuron methyl	83055-99-6	µg/L	0.1
Diuron	330-54-1	µg/L	0.02
Fluometuron	2164-17-2	µg/L	0.01
Chloroxuron	1982-47-4	µg/L	0.1
Tebuthiuron	34014-18-1	µg/L	0.02
Bromacil	314-40-9	µg/L	0.02
Chlorsulfuron	64902-72-3	µg/L	0.2
Diflubenzuron	35367-38-5	µg/L	0.1
Iodosulfuron methyl	144550-36-7	µg/L	0.1
Isoproturon	34123-59-6	µg/L	0.1
Novaluron	116714-46-6	µg/L	0.1
Rimsulfuron	122931-48-0	µg/L	0.1
Siduron	1982-49-6	µg/L	0.1
Terbacil	5902-51-2	µg/L	0.1
Trifloxysulfuron-sodium	199119-58-9	µg/L	0.1
EP234G: Chloracetanilides			
Alachlor	15972-60-8	µg/L	0.1
Metolachlor	51218-45-2	µg/L	0.01
Butachlor	23184-66-9	µg/L	0.1
Propachlor	1918-16-7	µg/L	0.1
EP234H: Triazine Herbicides			
Ametryn	834-12-8	µg/L	0.01
Atrazine	1912-24-9	µg/L	0.01
Atrazine-desethyl	6190-65-4	µg/L	0.1
Atrazine-desisopropyl	1007-28-9	µg/L	0.1
Cyanazine	21725-46-2	µg/L	0.02
Cyromazine	66215-27-8	µg/L	0.05
Prometryn	7287-19-6	µg/L	0.01
Propazine	139-40-2	µg/L	0.01

Simazine	122-34-9	µg/L	0.02
Terbuthylazine	5915-41-3	µg/L	0.01
Terbutryn	886-50-0	µg/L	0.01
EP234I: Miscellaneous (ESI Positive Mode) Pesticides			
Abamectin	71751-41-2	µg/L	0.1
Aminopyralid	150114-71-9	µg/L	0.1
Amitraz	33089-61-1	µg/L	100
Azoxystrobin	131860-33-8	µg/L	0.1
Boscalid	188425-85-6	µg/L	0.1
Carbendazim (Thiophanate methyl)	10605-21-7	µg/L	0.1
Carboxin	5234-68-4	µg/L	0.1
Carfentrazone-ethyl	128639-02-1	µg/L	0.1
Chlorantraniliprole	500008-45-7	µg/L	0.1
Dichlobenil	1194-65-6	µg/L	0.1
Diclofop-methyl	51338-27-3	µg/L	0.05
Diphenamid	957-51-7	µg/L	0.1
Etridiazole	2593-15-9	µg/L	0.5
Fenarimol	60168-88-9	µg/L	0.02
Flamprop methyl	52756-25-9	µg/L	0.1
Haloxyfop	69806-34-4	µg/L	0.1
Imazapyr	94795-74-1	µg/L	10
Indoxacarb	173584-44-6	µg/L	0.1
Irgarol	28159-98-0	µg/L	0.002
Metalaxyl	57837-19-1	µg/L	0.1
Metalaxyl-M	70630-17-0	µg/L	0.1
Metaldehyde	108-62-3	µg/L	10
Napropamide	15299-99-7	µg/L	0.1
Norflurazon	27314-13-2	µg/L	0.1
Oxyfluorfen	42874-03-3	µg/L	1
Prochloraz	67747-09-5	µg/L	0.1
Propargite	2312-35-8	µg/L	0.1
Propyzamide	23950-58-5	µg/L	0.1
Pyraclostrobin	175013-18-0	µg/L	0.1
Quinclorac	84087-01-4	µg/L	0.1
Spirotetramat	203313-25-1	µg/L	0.1
Thiamethoxam	153719-23-4	µg/L	0.02
Toltrazuril	69004-03-1	µg/L	0.1
Trifloxystrobin	141517-21-7	µg/L	0.1
Trinexapac Ethyl	95266-40-3	µg/L	1
EP247: Phenolics and Related Compounds			
2,4-Dinitrophenol	51-28-5	µg/L	0.01
2-Methyl-4.6-dinitrophenol	8071-51-0	µg/L	0.05
4-Nonylphenol (mixture of isomers)	84852-15-3	µg/L	0.1
Hexachlorophene	70-30-4	µg/L	0.1
4-Nitrophenol	100-02-7	µg/L	0.1
4-Chloro-3-methylphenol	59-50-7	µg/L	0.1
Pentachlorophenol	87-86-5	µg/L	0.1
Dinoseb	88-85-7	µg/L	0.1
Dalapon	75-99-0	µg/L	0.1
Bisphenol-A	80-05-7	µg/L	0.05
EP075C: Phthalate Esters			
Dimethyl phthalate	131-11-3	µg/L	2
Diethyl phthalate	84-66-2	µg/L	2
Di-n-butyl phthalate	84-74-2	µg/L	2
Butyl benzyl phthalate	85-68-7	µg/L	2
Bis(2-ethylhexyl) phthalate	117-81-7	µg/L	10

Di-n-octylphthalate	117-84-0	µg/L	2
Other Miscellaneous (added later in the project)			
Fluoride	16984-48-8	ug/L	100
Biological Oxygen Demand		mg/L	2
Chemical Oxygen Demand		mg/L	10
Silica – Reactive		mg/L	0.1
Reactive Phosphorous		ug/L	10
Chlorophyll a		mg/m3	1
Total Organic Carbon		mg/L	1
E. Coli		cfu/100ml	1
Heterotrophic Colony Count		cfu/ml	1
Total Coliforms		cfu/100ml	1

Appendix D

Analytical Methods Adopted

Table D1

Parameter	**ALS Code**	**Technique/ Method Reference**	**LOR (mg/L)** (or as indicated)
Dissolved metals in saline water by ORC-ICPMS: Al, As, Ba, Be, B, Cd, Cr, Co, Cu, Fe, Pb, Mn, Mo, Ni, Ag, Tl, Sn, Se, Sr U, V, Zn, Bi, Sb	EG093-F	APHA 3125B ORC/ICP/MS Octopole Reaction Cell	Al, Fe, Sn, Zn: 5 μg/L As, Cr, Mn, Ni, V, Sb: 0.5 μg/L Ba, Cu, Sr: 1 μg/L Be, Mo, Ag, Tl, U, Bi: 0.1 μg/L Bo: 100 μg/L Cd, Co, Pb, Se: 0.2 μg/L
Dissolved Metals by ICPMS: Ga, La	EG020F	USEPA 6020	0.001
Dissolved Mercury by FIMS - Low Level	EG035F-LL	APHA 3112- Hg B	0.00004
Major Cations (Ca, Mg, Na, K)	NT-01D	USEPA 6010	1
Total Hardness as CaCO3		APHA 2340 B	1
Sulfate (Turbidimetric) as SO4 2 by Discrete Analyser	ED041G	APHA 4500-SO4	1
Chloride by Discrete Analyser	ED045G	APHA 4500-Cl G	1
Biological Oxygen Demand (BOD)	EP030	APHA 5210 B	2 mg/L
Chemical Oxygen Demand (COD) (Spectrophotometric)	EP026SP	APHA 5220 D	10 mg/L
Silica - Reactive	EG052G	APHA 4500-SiO2 D	0.1
Reactive Phosphorus by Discrete analyser	EK071G	APHA 4500-P F	0.01 mg/L
Chlorophyll a	EP008	APHA 10200 H (modified)	1 mg/m^3
Total Organic Carbon (TOC)	EP005	APHA 5310 B	1 mg/L
Redox Potential	EA075	In-House (Ion selective electrode)	0.01 pH Unit, 0.1 mV
Cyanide - Free, WAD & Total	CN-FWT	APHA 4500-CN C / ASTM D7511, APHA 4500-CN C&O, ASTM D7237	0.004
TRH/BTEXN/PAH	W-7	USEPA 8015A, USEPA 8260B, USEPA 8270D	TRH: 50-100 μg/L BTEXN: 1-20 μg/L PAH: 0.5-1 μg/L
VOC Ultra trace screen (41 compounds including MAHs, THMs, Halogenated Aromatics, Naphthalene and MTBE)	EP125	USEPA 5030/8260 P&T/GC/MS or HS/GC/MS	0.04-2 μg/L
Phenolics and other Polar Compounds by LCMSMS (incl. Nitrophenols)	EP247	In-house	0.01 - 0.1 μg/L
Explosives - low level (incl. Nitrobenzenes & Nitrotoluenes)	EP203LL	In house (UV-DAD / LCMS)	1 - 5 μg/L
Chlorinated Naphthalenes	EP132C	USEPA 8270D	0.1 μg/L
SVOC - Chlorinated Hydrocarbons (incl. Hexachlorobutadiene, Hexachlorocyclopentadiene)	EP075G	USEPA 8270D	2 - 10 μg/L
Anilines and Benzidines	EP075H	USEPA 8270D	2-4 μg/L
Phthalate Esters & Other Plasticisers *(6 analytes)*	EP075C	USEPA 8270D	2-20 μg/L
OC *(22 analytes)* and PCBs *(7 PCBs)*, OP *(50 analytes including all OPs in the 2014 ADWG), plus 105* Triazine, Carbamates, Thiocarbamates, Conazoles and miscellaneous Pesticides - Ultra trace Level (184 analytes)	UTO-11W	LC/MS/MS (ESI positive) GPC/Florisil/GCμECD GPC/GC/MS	0.005-10

Synthetic Pyrethroids *(14 analytes)*	EP094	USEPA 3510/8270 GC/MS – SIM	0.5 µg/L
Phenols - Standard level (*12 analytes)*	EP075A (SIM)	USEPA 3510/8270	1-2 µg/L
Anionic Surfactants as MBAS	EP050	APHA 5540 B&C	0.1
Un-ionised Hydrogen Sulfide	EK084	APHA 4500-S2 H	0.1
Dissolved Trivalent Chromium by DA - Low Level	EG049G LL-F	APHA 3500-Cr B / USEPA 6020	0.001
Dissolved Hexavalent Chromium by DA - Low Level	EG050G LL-F	APHA 3500-Cr B	0.001
Chlorine - Total Residual	EK010	In house (DPD)	0.2
Alcohol (Ethanol, isopropanol, n-propanol, isobutanol, n-butanol	EP117	In house/HS/GC/MS	50 µg/L
Nitrogen Ammonia as N - Ultra Trace	EK255-CM	APHA 4500 NH3-H	0.005
Total Nitrogen UT (Persulfate excl' TKN & NOx	UTN-01	APHA 4500 P J	0.01
Phosphorus - Total (Persulfate) - Ultra trace		APHA 4500 P J	0.005
Nitrite as N - Ultra trace	EK257-CM	APHA 4500 NO^{2-} B	0.002
Nitrate as N - Ultra trace	EK258-CM	APHA 4500 NO^{3-} - I	0.002
Total Kjeldahl Nitrogen as N – UT	EK261-CM	APHA 4500-N$_{org}$ D	0.05
Phthalate Esters	EP075C	USEPA 3510/8270 GC/MS	2-10 µg/L
pH (PC)	EA005P	APHA 4500-H+ B	0.01 pH Unit
Conductivity (PC)	EA010P	APHA 2510 B	1 µS/cm
Suspended Solids (High Level)	EA025H	APHA 2540 D	5
Turbidity	EA045	APHA 2130 B	0.1 NTU
Oil & Grease (O&G)	EP020	APHA 5520 B	5
E.coli by Membrane Filtration	MW006 (Ec)	AS 4276.7 2007	1 CFU/100mL
Heterotrophic Colony Count (22'C)	MW002	AS4276.3.1- 2007	1 CFU/mL
Total Coliforms by Membrane Filtration	MW007	AS 4276.5 - 2007	1 CFU/100mL
Fluoride by PC Titrator	EK040P		0.1

APPENDIX E

Exhaustive Analytical Results

Environmental

CERTIFICATE OF ANALYSIS

Work Order : **ES1628843**
Amendment : **1**
Client : **BORAL RECYCLING - WIDEMERE**
Contact : PHILIP PATERSON
Address : Boral Recycling
Wetherill Park, NSW 2164
Telephone : 02 9604 9101
Project : SURFACE WATER ANALYSIS
Order number : 5684298
C-O-C number : ----
Sampler : Chris V.
Site : ----
Quote number : SY/662/16 V3
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 19
Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 14-Dec-2016 17:40
Date Analysis Commenced : 15-Dec-2016
Issue Date : 09-Jan-2017 09:41

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Diana Mesa	2IC Organic Chemist	Brisbane Organics, Stafford, QLD
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- EG093: Sample was run on EG094 method due to low TDS content.
- EP125: Poor matrix spike recovery due to sample matrix effects. This has been confirmed by re-analysis.
- EK255A-CM Repeated results confirm that NH3 spike failed due to sample amtrix interference
- Amendment (09/01/2017): This report has been amended following changes to the analytical data reported. The quality system is being utilised to resolve this issue. The specific data affected includes sample Dam2 for PAH/Phenol and SVOC results.
- EP050: The MBAS reported is calculated as LAS, mol wt __342_____.
- Total PAH reported as the sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene and Benzo(g,h,i)perylene.
- EP075: 'Sum of PAH' is the sum of the USEPA 16 priority PAHs
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

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

			Client sample ID	**Dam 2**	**----**	**----**	**----**	**----**
			Client sampling date / time	14-Dec-2016 14:30	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1628843-001**	--------	--------	--------	--------
				Result	----	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.91**	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**305**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**46**	----	----	----	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	**30.3**	----	----	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	**70**	----	----	----	----
EA075: Redox Potential								
Redox Potential	----	0.1	mV	**260**	----	----	----	----
pH Redox	----	0.01	pH Unit	**7.23**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**26**	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**41**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**20**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	**5**	----	----	----	----
Sodium	7440-23-5	1	mg/L	**27**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**7**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Gallium	7440-55-3	0.001	mg/L	**0.004**	----	----	----	----
Lanthanum	7439-91-0	0.001	mg/L	<0.001	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.00004	mg/L	<0.00004	----	----	----	----
EG049G LL-F: Dissolved Trivalent Chromium - Low Level								
Trivalent Chromium	16065-83-1	0.001	mg/L	**0.001**	----	----	----	----
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level								
Hexavalent Chromium	18540-29-9	0.001	mg/L	<0.001	----	----	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								
Aluminium	7429-90-5	5	µg/L	**135**	----	----	----	----
Arsenic	7440-38-2	0.5	µg/L	**0.6**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 2**	----	----	----	----
			Client sampling date / time	14-Dec-2016 14:30	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1628843-001**	--------	--------	--------	--------
				Result	----	----	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS - Continued								
Barium	7440-39-3	1	µg/L	**13**	----	----	----	----
Beryllium	7440-41-7	0.1	µg/L	<0.1	----	----	----	----
Boron	7440-42-8	100	µg/L	<100	----	----	----	----
Cadmium	7440-43-9	0.2	µg/L	<0.2	----	----	----	----
Chromium	7440-47-3	0.5	µg/L	**1.1**	----	----	----	----
Cobalt	7440-48-4	0.2	µg/L	<0.2	----	----	----	----
Copper	7440-50-8	1	µg/L	**18**	----	----	----	----
Iron	7439-89-6	5	µg/L	**6**	----	----	----	----
Lead	7439-92-1	0.2	µg/L	<0.2	----	----	----	----
Manganese	7439-96-5	0.5	µg/L	**2.8**	----	----	----	----
Molybdenum	7439-98-7	0.1	µg/L	**2.6**	----	----	----	----
Nickel	7440-02-0	0.5	µg/L	**1.5**	----	----	----	----
Selenium	7782-49-2	2	µg/L	<2	----	----	----	----
Silver	7440-22-4	0.1	µg/L	<0.1	----	----	----	----
Strontium	7440-24-6	10	µg/L	**84**	----	----	----	----
Thallium	7440-28-0	0.1	µg/L	<0.1	----	----	----	----
Tin	7440-31-5	5	µg/L	<5	----	----	----	----
Uranium	7440-61-1	0.1	µg/L	**0.2**	----	----	----	----
Vanadium	7440-62-2	0.5	µg/L	**8.4**	----	----	----	----
Zinc	7440-66-6	5	µg/L	**8**	----	----	----	----
EK010/011: Chlorine								
Chlorine - Total Residual	----	0.2	mg/L	<0.2	----	----	----	----
EK025SF: Free CN by Segmented Flow Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	----	----	----	----
EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser								
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	----	----	----	----
EK084: Un-ionized Hydrogen Sulfide								
Unionized Hydrogen Sulfide	----	0.1	mg/L	<0.1	----	----	----	----
EK255A: Ammonia								
Ammonia as N	7664-41-7	0.005	mg/L	**0.176**	----	----	----	----
EK257A: Nitrite								
Nitrite as N	14797-65-0	0.002	mg/L	**0.021**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 2**	**----**	**----**	**----**	**----**
			Client sampling date / time	14-Dec-2016 14:30	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1628843-001**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EK258A: Nitrate								
Nitrate as N	14797-55-8	0.002	mg/L	**0.063**	----	----	----	----
EK259A: Nitrite and Nitrate (NOx)								
Nitrite + Nitrate as N	----	0.002	mg/L	**0.084**	----	----	----	----
EK261A: Total Kjeldahl Nitrogen								
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	**1.98**	----	----	----	----
EK262A: Total Nitrogen								
Total Nitrogen as N	----	0.01	mg/L	**2.06**	----	----	----	----
EK267A: Total Phosphorus (Persulfate Digestion)								
Total Phosphorus as P	----	0.005	mg/L	**0.013**	----	----	----	----
EP020: Oil and Grease (O&G)								
Oil & Grease	----	5	mg/L	<5	----	----	----	----
EP050: Anionic Surfactants as MBAS								
Anionic Surfactants as MBAS	----	0.1	mg/L	**0.1**	----	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1	µg/L	<1.0	----	----	----	----
2-Chlorophenol	95-57-8	1	µg/L	<1.0	----	----	----	----
2-Methylphenol	95-48-7	1	µg/L	<1.0	----	----	----	----
3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	----	----	----	----
2-Nitrophenol	88-75-5	1	µg/L	<1.0	----	----	----	----
2.4-Dimethylphenol	105-67-9	1	µg/L	<1.0	----	----	----	----
2.4-Dichlorophenol	120-83-2	1	µg/L	<1.0	----	----	----	----
2.6-Dichlorophenol	87-65-0	1	µg/L	<1.0	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	1	µg/L	<1.0	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	1	µg/L	<1.0	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	1	µg/L	<1.0	----	----	----	----
Pentachlorophenol	87-86-5	2	µg/L	<2.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1	µg/L	<1.0	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 2**	----	----	----	----
			Client sampling date / time	14-Dec-2016 14:30	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1628843-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Pyrene	129-00-0	1	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	----	----	----	----
EP075C: Phthalate Esters								
Dimethyl phthalate	131-11-3	2	µg/L	<2	----	----	----	----
Diethyl phthalate	84-66-2	2	µg/L	<2	----	----	----	----
Di-n-butyl phthalate	84-74-2	2	µg/L	<2	----	----	----	----
Butyl benzyl phthalate	85-68-7	2	µg/L	<2	----	----	----	----
bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L	<10	----	----	----	----
Di-n-octylphthalate	117-84-0	2	µg/L	<2	----	----	----	----
EP075G: Chlorinated Hydrocarbons								
1.3-Dichlorobenzene	541-73-1	2	µg/L	<2	----	----	----	----
1.4-Dichlorobenzene	106-46-7	2	µg/L	<2	----	----	----	----
1.2-Dichlorobenzene	95-50-1	2	µg/L	<2	----	----	----	----
Hexachloroethane	67-72-1	2	µg/L	<2	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	2	µg/L	<2	----	----	----	----
Hexachloropropylene	1888-71-7	2	µg/L	<2	----	----	----	----
Hexachlorobutadiene	87-68-3	2	µg/L	<2	----	----	----	----
Hexachlorocyclopentadiene	77-47-4	10	µg/L	<10	----	----	----	----
Pentachlorobenzene	608-93-5	2	µg/L	<2	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	4	µg/L	<4	----	----	----	----
EP075H: Anilines and Benzidines								
Aniline	62-53-3	2	µg/L	<2	----	----	----	----
4-Chloroaniline	106-47-8	2	µg/L	<2	----	----	----	----
2-Nitroaniline	88-74-4	4	µg/L	<4	----	----	----	----
3-Nitroaniline	99-09-2	4	µg/L	<4	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**Dam 2**	----	----	----	----
			Client sampling date / time	14-Dec-2016 14:30	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1628843-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP075H: Anilines and Benzidines - Continued								
Dibenzofuran	132-64-9	2	µg/L	<2	----	----	----	----
4-Nitroaniline	100-01-6	2	µg/L	<2	----	----	----	----
Carbazole	86-74-8	2	µg/L	<2	----	----	----	----
3.3`-Dichlorobenzidine	91-94-1	2	µg/L	<2	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ **Total Xylenes**	1330-20-7	2	µg/L	<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP094A: Synthetic Pyrethroids								
Bioresmethrin	28434-01-07	0.5	µg/L	<0.5	----	----	----	----
Bifenthrin	82657-04-3	0.5	µg/L	<0.5	----	----	----	----
Phenothrin	26002-80-2	0.5	µg/L	<0.5	----	----	----	----
Lambda-cyhalothrin	68085-85-8	0.5	µg/L	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 2**	----	----	----	----
			Client sampling date / time	14-Dec-2016 14:30	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1628843-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP094A: Synthetic Pyrethroids - Continued								
Permethrin	52645-53-1	0.5	µg/L	<0.5	----	----	----	----
Cyfluthrin	68359-37-5	0.5	µg/L	<0.5	----	----	----	----
Cypermethrin	52315-07-8	0.5	µg/L	<0.5	----	----	----	----
Fenvalerate & Esfenvalerate	51630-58-1/66230-04-	0.5	µg/L	<0.5	----	----	----	----
Deltamethrin & Tralomethrin	62229-77-0/66841-25-	0.5	µg/L	<0.5	----	----	----	----
Allethrin	----	0.5	µg/L	<0.5	----	----	----	----
Transfluthrin	118712-89-3	0.5	µg/L	<0.5	----	----	----	----
Tau-fluvalinate	----	0.5	µg/L	<0.5	----	----	----	----
Tetramethrin	----	0.5	µg/L	<0.5	----	----	----	----
EP094B: Synergist								
Piperonyl Butoxide	63993-73-7	0.5	µg/L	<0.5	----	----	----	----
EP117: Alcohols								
Ethanol	64-17-5	50	µg/L	<50	----	----	----	----
Isopropanol	67-63-0	50	µg/L	<50	----	----	----	----
n-Propanol	71-23-8	50	µg/L	<50	----	----	----	----
Isobutanol	78-83-1	50	µg/L	<50	----	----	----	----
n-Butanol	71-36-3	50	µg/L	<50	----	----	----	----
EP125A: Monocyclic Aromatic Hydrocarbons								
Benzene	71-43-2	0.05	µg/L	<0.05	----	----	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.05	µg/L	<0.05	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.05	µg/L	<0.05	----	----	----	----
Styrene	100-42-5	0.05	µg/L	<0.05	----	----	----	----
ortho-Xylene	95-47-6	0.05	µg/L	<0.05	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	0.05	µg/L	<0.05	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	0.05	µg/L	<0.05	----	----	----	----
EP125D: Fumigants								
1.2-Dichloropropane	78-87-5	0.1	µg/L	<0.1	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.1	µg/L	<0.1	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.1	µg/L	<0.1	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.1	µg/L	<0.1	----	----	----	----
EP125E: Halogenated Aliphatic Compounds								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 2**	**----**	**----**	**----**	**----**
			Client sampling date / time	14-Dec-2016 14:30	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1628843-001**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EP125E: Halogenated Aliphatic Compounds - Continued								
Dichlorodifluoromethane	75-71-8	0.5	µg/L	<0.5	----	----	----	----
Vinyl chloride	75-01-4	0.3	µg/L	<0.3	----	----	----	----
Bromomethane	74-83-9	0.5	µg/L	<0.5	----	----	----	----
Chloroethane	75-00-3	0.5	µg/L	<0.5	----	----	----	----
Trichlorofluoromethane	75-69-4	0.5	µg/L	<0.5	----	----	----	----
1.1-Dichloroethene	75-35-4	0.1	µg/L	<0.1	----	----	----	----
Dichloromethane	75-09-2	1	µg/L	<1.0	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	0.1	µg/L	<0.1	----	----	----	----
1.1-Dichloroethane	75-34-3	0.1	µg/L	<0.1	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	0.1	µg/L	<0.1	----	----	----	----
Bromochloromethane	74-97-5	0.5	µg/L	<0.5	----	----	----	----
1.2-Dichloroethane	107-06-2	0.1	µg/L	<0.1	----	----	----	----
1.1.1-Trichloroethane	71-55-6	0.1	µg/L	<0.1	----	----	----	----
Carbon Tetrachloride	56-23-5	0.05	µg/L	<0.05	----	----	----	----
Trichloroethene	79-01-6	0.05	µg/L	<0.05	----	----	----	----
Tetrachloroethene	127-18-4	0.05	µg/L	<0.05	----	----	----	----
Hexachlorobutadiene	87-68-3	0.04	µg/L	<0.04	----	----	----	----
EP125F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	0.1	µg/L	<0.10	----	----	----	----
Bromobenzene	108-86-1	0.1	µg/L	<0.10	----	----	----	----
Benzylchloride	100-44-7	0.2	µg/L	<0.2	----	----	----	----
1.3-Dichlorobenzene	541-73-1	0.1	µg/L	<0.10	----	----	----	----
1.4-Dichlorobenzene	106-46-7	0.1	µg/L	<0.10	----	----	----	----
1.2-Dichlorobenzene	95-50-1	0.1	µg/L	<0.10	----	----	----	----
2-Chlorotoluene	95-49-8	0.1	µg/L	<0.1	----	----	----	----
4-Chlorotoluene	106-43-4	0.1	µg/L	<0.1	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.1	µg/L	<0.1	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.1	µg/L	<0.1	----	----	----	----
^ **Trichlorobenzenes (Sum)**	----	0.1	µg/L	<0.1	----	----	----	----
EP125G: Trihalomethanes								
Chloroform	67-66-3	0.1	µg/L	**13.1**	----	----	----	----
Bromodichloromethane	75-27-4	0.1	µg/L	**5.85**	----	----	----	----
Dibromochloromethane	124-48-1	0.1	µg/L	**1.38**	----	----	----	----
Bromoform	75-25-2	0.1	µg/L	<0.10	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 2**	----	----	----	----
			Client sampling date / time	14-Dec-2016 14:30	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1628843-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP125G: Trihalomethanes - Continued								
^ **Total Trihalomethanes**	----	0.1	µg/L	**20.3**	----	----	----	----
EP125H: Naphthalene								
Naphthalene	91-20-3	0.05	µg/L	**0.23**	----	----	----	----
EP125L: Methyl t-butyl ether								
Methyl tert-butyl ether (MTBE)	1634-04-4	0.1	µg/L	<0.1	----	----	----	----
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.01	µg/L	<0.010	----	----	----	----
alpha-BHC	319-84-6	0.01	µg/L	<0.010	----	----	----	----
beta-BHC	319-85-7	0.01	µg/L	<0.010	----	----	----	----
delta-BHC	319-86-8	0.01	µg/L	<0.010	----	----	----	----
4.4`-DDD	72-54-8	0.01	µg/L	<0.010	----	----	----	----
4.4`-DDE	72-55-9	0.01	µg/L	<0.010	----	----	----	----
4.4`-DDT	50-29-3	0.01	µg/L	<0.010	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.01	µg/L	<0.010	----	----	----	----
Dieldrin	60-57-1	0.01	µg/L	<0.010	----	----	----	----
alpha-Endosulfan	959-98-8	0.01	µg/L	<0.010	----	----	----	----
beta-Endosulfan	33213-65-9	0.01	µg/L	<0.010	----	----	----	----
Endosulfan sulfate	1031-07-8	0.01	µg/L	<0.010	----	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.01	µg/L	<0.010	----	----	----	----
Endrin	72-20-8	0.01	µg/L	<0.010	----	----	----	----
Endrin aldehyde	7421-93-4	0.01	µg/L	<0.010	----	----	----	----
Endrin ketone	53494-70-5	0.01	µg/L	<0.010	----	----	----	----
Heptachlor	76-44-8	0.005	µg/L	<0.005	----	----	----	----
Heptachlor epoxide	1024-57-3	0.01	µg/L	<0.010	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.01	µg/L	<0.010	----	----	----	----
gamma-BHC	58-89-9	0.01	µg/L	<0.010	----	----	----	----
Methoxychlor	72-43-5	0.01	µg/L	<0.010	----	----	----	----
cis-Chlordane	5103-71-9	0.01	µg/L	<0.010	----	----	----	----
trans-Chlordane	5103-74-2	0.01	µg/L	<0.010	----	----	----	----
^ **Total Chlordane (sum)**	----	0.01	µg/L	<0.010	----	----	----	----
Oxychlordane	27304-13-8	0.01	µg/L	<0.010	----	----	----	----
EP131B: Polychlorinated Biphenyls (as Aroclors)								
Total Polychlorinated biphenyls	----	0.1	µg/L	<0.10	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 2**	----	----	----	----
			Client sampling date / time	14-Dec-2016 14:30	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1628843-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP131B: Polychlorinated Biphenyls (as Aroclors) - Continued								
Aroclor 1016	12674-11-2	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1221	11104-28-2	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1232	11141-16-5	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1242	53469-21-9	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1248	12672-29-6	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1254	11097-69-1	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1260	11096-82-5	0.1	µg/L	<0.10	----	----	----	----
EP132C: Chlorinated Naphthalenes								
1-Chloronaphthalene	90-13-1	0.1	µg/L	<0.1	----	----	----	----
2-Chloronaphthalene	91-58-7	0.1	µg/L	<0.1	----	----	----	----
^ **Chloronaphthalenes (1- + 2-)**	----	0.1	µg/L	<0.1	----	----	----	----
EP203A: Explosives								
HMX	2691-41-0	1	µg/L	<1.0	----	----	----	----
RDX	----	1	µg/L	<1.0	----	----	----	----
1.3.5-Trinitrobenzene	99-35-4	1	µg/L	<1.0	----	----	----	----
1.3-Dinitrobenzene	99-65-0	1	µg/L	<1.0	----	----	----	----
Tetryl	479-45-8	1	µg/L	<1.0	----	----	----	----
2.4.6-TNT	118-96-7	1	µg/L	<1.0	----	----	----	----
4-Amino.2.6-DNT	19406-51-0	1	µg/L	<1.0	----	----	----	----
2-Amino-4.6-DNT	35572-78-2	1	µg/L	<1.0	----	----	----	----
4-& 2-AM-DNT(Isomeric Mixture)	----	1	µg/L	<1.0	----	----	----	----
2.4-Dinitrotoluene	121-14-2	1	µg/L	<1.0	----	----	----	----
2.6-Dinitrotoluene	606-20-2	1	µg/L	<1.0	----	----	----	----
2.4-& 2.6-DNT(Isomeric Mixture)	51-28-5/606-20-2	1	µg/L	<1.0	----	----	----	----
Nitrobenzene	98-95-3	1	µg/L	**4.7**	----	----	----	----
2-Nitrotoluene	88-72-2	1	µg/L	<1.0	----	----	----	----
3-Nitrotoluene	99-08-1	1	µg/L	<1.0	----	----	----	----
4-Nitrotoluene	99-99-0	1	µg/L	<1.0	----	----	----	----
Nitroglycerine	55-63-0	5	µg/L	<5	----	----	----	----
PETN	78-11-5	5	µg/L	<5	----	----	----	----
EP234: Multiresidue Pesticides (ESI Positive)								
3-Hydroxy Carbofuran	16655-82-6	0.02	µg/L	<0.02	----	----	----	----
Abamectin	71751-41-2	0.1	µg/L	<0.1	----	----	----	----
Alachlor	15972-60-8	0.1	µg/L	<0.1	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 2**	**----**	**----**	**----**	**----**
			Client sampling date / time	14-Dec-2016 14:30	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1628843-001**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Aldicarb	116-06-3	0.05	µg/L	<0.05	----	----	----	----
Ametryn	834-12-8	0.01	µg/L	<0.01	----	----	----	----
Aminopyralid	150114-71-9	0.1	µg/L	<0.1	----	----	----	----
Amitraz	33089-61-1	100	µg/L	<100	----	----	----	----
Atrazine	1912-24-9	0.01	µg/L	<0.01	----	----	----	----
Atrazine-desethyl	6190-65-4	0.1	µg/L	<0.1	----	----	----	----
Atrazine-desisopropyl	1007-28-9	0.1	µg/L	<0.1	----	----	----	----
Azoxystrobin	131860-33-8	0.1	µg/L	<0.1	----	----	----	----
Bendiocarb	22781-23-3	0.1	µg/L	<0.10	----	----	----	----
Benomyl	17804-35-2	0.01	µg/L	**0.08**	----	----	----	----
Bensulfuron methyl	83055-99-6	0.1	µg/L	<0.1	----	----	----	----
Boscalid	188425-85-6	0.1	µg/L	<0.1	----	----	----	----
Bromacil	314-40-9	0.02	µg/L	<0.02	----	----	----	----
Butachlor	23184-66-9	0.1	µg/L	<0.1	----	----	----	----
Carbaryl	63-25-2	0.01	µg/L	<0.01	----	----	----	----
Carbendazim (Thiophanate methyl)	10605-21-7	0.1	µg/L	<0.1	----	----	----	----
Carbofuran	1563-66-2	0.01	µg/L	<0.01	----	----	----	----
Carboxin	5234-68-4	0.1	µg/L	<0.1	----	----	----	----
Carfentrazone-ethyl	128639-02-1	0.1	µg/L	<0.1	----	----	----	----
Chlorantraniliprole	500008-45-7	0.1	µg/L	<0.1	----	----	----	----
Chloroxuron	1982-47-4	0.1	µg/L	<0.1	----	----	----	----
Chlorsulfuron	64902-72-3	0.2	µg/L	<0.2	----	----	----	----
Cyanazine	21725-46-2	0.02	µg/L	<0.02	----	----	----	----
Cyproconazole	94361-06-5	0.02	µg/L	<0.02	----	----	----	----
Cyprodinil	121552-61-2	0.01	µg/L	<0.01	----	----	----	----
Cyromazine	66215-27-8	0.05	µg/L	<0.05	----	----	----	----
Dichlobenil	1194-65-6	0.1	µg/L	<0.1	----	----	----	----
Diclofop-methyl	51338-27-3	0.05	µg/L	<0.05	----	----	----	----
Difenoconazole	119446-68-3	0.02	µg/L	<0.02	----	----	----	----
Diflubenzuron	35367-38-5	0.1	µg/L	<0.1	----	----	----	----
Diphenamid	957-51-7	0.1	µg/L	<0.1	----	----	----	----
Diuron	330-54-1	0.02	µg/L	<0.02	----	----	----	----
EPTC	759-94-4	0.1	µg/L	<0.1	----	----	----	----
Etridiazole	2593-15-9	0.5	µg/L	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**Dam 2**	----	----	----	----
			Client sampling date / time	14-Dec-2016 14:30	----	----	----	----
Compound	CAS Number	LOR	Unit	**ES1628843-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Fenarimol	60168-88-9	0.02	µg/L	<0.02	----	----	----	----
Fenoxycarb	79127-80-3	0.1	µg/L	<0.1	----	----	----	----
Flamprop methyl	52756-25-9	0.1	µg/L	<0.1	----	----	----	----
Fluometuron	2164-17-2	0.01	µg/L	<0.01	----	----	----	----
Flusilazole	85509-19-9	0.02	µg/L	<0.02	----	----	----	----
Haloxyfop	69806-34-4	0.1	µg/L	<0.1	----	----	----	----
Hexaconazole	79983-71-4	0.02	µg/L	<0.02	----	----	----	----
Hexazinone	51235-04-2	0.02	µg/L	<0.02	----	----	----	----
Imazapyr	94795-74-1	10	µg/L	<10.0	----	----	----	----
Indoxacarb	173584-44-6	0.1	µg/L	<0.1	----	----	----	----
Iodosulfuron methyl	144550-36-7	0.1	µg/L	<0.1	----	----	----	----
Irgarol	28159-98-0	0.002	µg/L	<0.002	----	----	----	----
Isoproturon	34123-59-6	0.1	µg/L	<0.1	----	----	----	----
Metalaxyl	57837-19-1	0.1	µg/L	<0.1	----	----	----	----
Metalaxyl-M	70630-17-0	0.1	µg/L	<0.1	----	----	----	----
Metaldehyde	108-62-3	10	µg/L	<10	----	----	----	----
Methiocarb	2032-65-7	0.01	µg/L	<0.01	----	----	----	----
Methomyl	16752-77-5	0.01	µg/L	<0.01	----	----	----	----
Metolachlor	51218-45-2	0.01	µg/L	**0.01**	----	----	----	----
Metribuzin	21087-64-9	0.02	µg/L	<0.02	----	----	----	----
Molinate	2212-67-1	0.1	µg/L	<0.1	----	----	----	----
Myclobutanil	88671-89-0	0.1	µg/L	<0.1	----	----	----	----
Napropamide	15299-99-7	0.1	µg/L	<0.1	----	----	----	----
Nitralin	4726-14-1	0.1	µg/L	<0.1	----	----	----	----
Norflurazon	27314-13-2	0.1	µg/L	<0.1	----	----	----	----
Novaluron	116714-46-6	0.1	µg/L	<0.1	----	----	----	----
Oxamyl	23135-22-0	0.01	µg/L	<0.01	----	----	----	----
Oxyfluorfen	42874-03-3	1	µg/L	<1.0	----	----	----	----
Paclobutrazole	76738-62-0	0.05	µg/L	<0.05	----	----	----	----
Pebulate	1114-71-2	0.1	µg/L	<0.1	----	----	----	----
Penconazole	66246-88-6	0.01	µg/L	<0.01	----	----	----	----
Pendimethalin	40487-42-1	0.05	µg/L	<0.05	----	----	----	----
Pirimicarb	23103-98-2	0.1	µg/L	<0.1	----	----	----	----
Prochloraz	67747-09-5	0.1	µg/L	<0.1	----	----	----	----
Promecarb	2631-37-0	0.1	µg/L	<0.1	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 2**	----	----	----	----
			Client sampling date / time	14-Dec-2016 14:30	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1628843-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Prometryn	7287-19-6	0.01	µg/L	<0.01	----	----	----	----
Propachlor	1918-16-7	0.1	µg/L	<0.1	----	----	----	----
Propamocarb	24579-73-5	0.1	µg/L	<0.1	----	----	----	----
Propargite	2312-35-8	0.1	µg/L	<0.1	----	----	----	----
Propazine	139-40-2	0.01	µg/L	<0.01	----	----	----	----
Propiconazole	60207-90-1	0.05	µg/L	<0.05	----	----	----	----
Propyzamide	23950-58-5	0.1	µg/L	<0.1	----	----	----	----
Pyraclostrobin	175013-18-0	0.1	µg/L	<0.1	----	----	----	----
Pyrimethanil	53112-28-0	0.02	µg/L	<0.02	----	----	----	----
Pyriproxyfen	95737-68-1	0.1	µg/L	<0.1	----	----	----	----
Pyroxsulam	422556-08-9	0.1	µg/L	<0.1	----	----	----	----
Quinclorac	84087-01-4	0.1	µg/L	<0.1	----	----	----	----
Rimsulfuron	122931-48-0	0.1	µg/L	<0.1	----	----	----	----
Siduron	1982-49-6	0.1	µg/L	<0.1	----	----	----	----
Simazine	122-34-9	0.02	µg/L	<0.02	----	----	----	----
Spirotetramat	203313-25-1	0.1	µg/L	<0.1	----	----	----	----
Tebuconazole	107534-96-3	0.01	µg/L	<0.01	----	----	----	----
Tebuthiuron	34014-18-1	0.02	µg/L	<0.02	----	----	----	----
Terbacil	5902-51-2	0.1	µg/L	<0.1	----	----	----	----
Terbuthylazine	5915-41-3	0.01	µg/L	<0.01	----	----	----	----
Terbutryn	886-50-0	0.01	µg/L	<0.01	----	----	----	----
Tetraconazole	112281-77-3	0.1	µg/L	<0.1	----	----	----	----
Thiamethoxam	153719-23-4	0.02	µg/L	<0.02	----	----	----	----
Thiobencarb	28249-77-6	0.01	µg/L	<0.01	----	----	----	----
Thiodicarb	59669-26-0	0.01	µg/L	<0.01	----	----	----	----
Toltrazuril	69004-03-1	0.5	µg/L	<0.5	----	----	----	----
Triadimefon	43121-43-3	0.1	µg/L	<0.1	----	----	----	----
Triadimenol	55219-65-3	0.1	µg/L	<0.1	----	----	----	----
Trifloxystrobin	141517-21-7	0.1	µg/L	<0.1	----	----	----	----
Trifloxysulfuron-sodium	199119-58-9	0.1	µg/L	<0.1	----	----	----	----
Trifluralin	1582-09-8	10	µg/L	<10.0	----	----	----	----
Trinexapac Ethyl	95266-40-3	1	µg/L	<1	----	----	----	----
Vernolate	1929-77-7	0.1	µg/L	<0.1	----	----	----	----
EP234A: OP Pesticides								
Acephate	30560-19-1	0.5	µg/L	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 2**	----	----	----	----
			Client sampling date / time	14-Dec-2016 14:30	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1628843-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP234A: OP Pesticides - Continued								
Azinphos-methyl	86-50-0	0.02	µg/L	<0.02	----	----	----	----
Azinphos-ethyl	2642-71-9	0.02	µg/L	<0.02	----	----	----	----
Bensulide	741-58-2	0.1	µg/L	<0.1	----	----	----	----
Bromophos-ethyl	4824-78-6	0.1	µg/L	<0.10	----	----	----	----
Carbofenothion	786-19-6	0.02	µg/L	<0.02	----	----	----	----
Chlorfenvinphos	470-90-6	0.02	µg/L	<0.02	----	----	----	----
Chlorpyrifos	2921-88-2	0.02	µg/L	<0.02	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.1	µg/L	<0.2	----	----	----	----
Coumaphos	56-72-4	0.01	µg/L	<0.01	----	----	----	----
Demeton-O	298-03-0	0.02	µg/L	<0.02	----	----	----	----
Demeton-O & Demeton-S	298-03-3/126-75-0	0.02	µg/L	<0.02	----	----	----	----
Demeton-S	126-75-0	0.02	µg/L	<0.02	----	----	----	----
Demeton-S-methyl	919-86-8	0.02	µg/L	<0.02	----	----	----	----
Diazinon	333-41-5	0.01	µg/L	<0.01	----	----	----	----
Dichlorvos	62-73-7	0.2	µg/L	<0.20	----	----	----	----
Dimethoate	60-51-5	0.02	µg/L	<0.02	----	----	----	----
Disulfoton	298-04-4	0.05	µg/L	<0.05	----	----	----	----
EPN	2104-64-5	0.05	µg/L	<0.05	----	----	----	----
Ethion	563-12-2	0.02	µg/L	<0.02	----	----	----	----
Ethoprophos	13194-48-4	0.01	µg/L	<0.01	----	----	----	----
Fenamiphos	22224-92-6	0.01	µg/L	<0.01	----	----	----	----
Fenchlorphos (Ronnel)	299-84-3	10	µg/L	<10	----	----	----	----
Fenitrothion	122-14-5	2	µg/L	<2	----	----	----	----
Fensulfothion	115-90-2	0.01	µg/L	<0.01	----	----	----	----
Fenthion	55-38-9	0.05	µg/L	<0.05	----	----	----	----
Formothion	2540-82-1	20	µg/L	<20	----	----	----	----
Fosetyl Aluminium	39148-24-8	10	µg/L	<10	----	----	----	----
Malathion	121-75-5	0.02	µg/L	<0.02	----	----	----	----
Methidathion	950-37-8	0.1	µg/L	<0.1	----	----	----	----
Mevinphos	7786-34-7	0.02	µg/L	<0.02	----	----	----	----
Monocrotophos	6923-22-4	0.02	µg/L	<0.02	----	----	----	----
Naftalofos	1491-41-4	1	µg/L	<1.0	----	----	----	----
Omethoate	1113-02-6	0.01	µg/L	<0.01	----	----	----	----
Parathion	56-38-2	0.2	µg/L	<0.2	----	----	----	----
Parathion-methyl	298-00-0	0.5	µg/L	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**Dam 2**	----	----	----	----
			Client sampling date / time	14-Dec-2016 14:30	----	----	----	----
Compound	CAS Number	LOR	Unit	**ES1628843-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP234A: OP Pesticides - Continued								
Phorate	298-02-2	0.1	µg/L	<0.1	----	----	----	----
Pirimiphos-ethyl	23505-41-1	0.01	µg/L	<0.01	----	----	----	----
Pirimiphos-methyl	29232-93-7	0.01	µg/L	<0.01	----	----	----	----
Profenofos	41198-08-7	0.01	µg/L	<0.01	----	----	----	----
Prothiofos	34643-46-4	0.1	µg/L	<0.1	----	----	----	----
Pyrazophos	13457-18-6	0.1	µg/L	<0.1	----	----	----	----
Sulfotep	3689-24-5	0.005	µg/L	<0.005	----	----	----	----
Sulprofos	35400-43-2	0.05	µg/L	<0.05	----	----	----	----
Temephos	3383-96-8	0.02	µg/L	<0.02	----	----	----	----
Terbufos	13071-79-9	0.01	µg/L	<0.01	----	----	----	----
Tetrachlorvinphos	22248-79-9	0.01	µg/L	<0.01	----	----	----	----
Thiometon	640-15-3	0.5	µg/L	<0.5	----	----	----	----
Triazophos	24017-47-8	0.005	µg/L	<0.005	----	----	----	----
Trichlorfon	52-68-6	0.02	µg/L	<0.02	----	----	----	----
Trichloronate	327-98-0	0.5	µg/L	<0.5	----	----	----	----
EP247: Phenolics and Related Compounds								
2,4-Dinitrophenol	51-28-5	0.01	µg/L	<0.01	----	----	----	----
2-Methyl-4.6-dinitrophenol	8071-51-0	0.05	µg/L	<0.05	----	----	----	----
4-Nonylphenol (mixture of isomers)	84852-15-3	0.1	µg/L	<0.10	----	----	----	----
Hexachlorophene	70-30-4	0.1	µg/L	<0.10	----	----	----	----
4-Nitrophenol	100-02-7	0.1	µg/L	<0.10	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.1	µg/L	<0.10	----	----	----	----
Pentachlorophenol	87-86-5	0.1	µg/L	<0.10	----	----	----	----
Dinoseb	88-85-7	0.1	µg/L	<0.10	----	----	----	----
Dalapon	75-99-0	0.1	µg/L	**0.31**	----	----	----	----
Bisphenol-A	80-05-7	0.05	µg/L	**0.57**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	**24.0**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%	**48.0**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%	**84.0**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	**72.0**	----	----	----	----
Anthracene-d10	1719-06-8	1	%	**86.0**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**Dam 2**	----	----	----	----
			Client sampling date / time	14-Dec-2016 14:30	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1628843-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP075(SIM)T: PAH Surrogates - Continued								
4-Terphenyl-d14	1718-51-0	1	%	**78.0**	----	----	----	----
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	2	%	**41.2**	----	----	----	----
Phenol-d6	13127-88-3	2	%	**30.0**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	2	%	**57.1**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	2	%	**63.7**	----	----	----	----
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	2	%	**65.4**	----	----	----	----
1.2-Dichlorobenzene-D4	2199-69-1	2	%	**60.0**	----	----	----	----
2-Fluorobiphenyl	321-60-8	2	%	**75.1**	----	----	----	----
Anthracene-d10	1719-06-8	2	%	**88.5**	----	----	----	----
4-Terphenyl-d14	1718-51-0	2	%	**83.8**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**122**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**123**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**116**	----	----	----	----
EP094S: Pesticide Surrogate								
DEF	78-48-8	0.5	%	**81.8**	----	----	----	----
EP125S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**104**	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	**108**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**104**	----	----	----	----
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.01	%	**108**	----	----	----	----
EP131T: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	**117**	----	----	----	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**68.4**	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%	**74.5**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**69.6**	----	----	----	----
EP203S: Explosives Surrogate								
o-Dinitrobenzene	528-29-0	1	%	**84.5**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	*CAS Number*	*Recovery Limits (%)* Low	*Recovery Limits (%)* High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	10	117
Phenol-d6	13127-88-3	10	69
2-Chlorophenol-D4	93951-73-6	21	130
2.4.6-Tribromophenol	118-79-6	10	151
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	29	142
1.2-Dichlorobenzene-D4	2199-69-1	24	121
2-Fluorobiphenyl	321-60-8	27	135
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	21	123
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128
EP094S: Pesticide Surrogate			
DEF	78-48-8	42	143
EP125S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	65	127
4-Bromofluorobenzene	460-00-4	68	124
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	14	166
EP131T: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	10	144
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	135
Anthracene-d10	1719-06-8	48	138
4-Terphenyl-d14	1718-51-0	48	144
EP203S: Explosives Surrogate			

Sub-Matrix: **WATER**

Compound	*CAS Number*	*Recovery Limits (%)*	
		Low	***High***
EP203S: Explosives Surrogate - Continued			
o-Dinitrobenzene	528-29-0	51	125

CERTIFICATE OF ANALYSIS

Work Order	: **ES1629089**	Page	: 1 of 20
Client	: **BORAL RECYCLING - WIDEMERE**	Laboratory	: Environmental Division Sydney
Contact	: PHILIP PATERSON	Contact	: Customer Services ES
Address	: Boral Recycling Wetherill Park, NSW 2164	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: 02 9604 9101	Telephone	: +61-2-8784 8555
Project	: SURFACE WATER ANALYSIS	Date Samples Received	: 16-Dec-2016 16:05
Order number	: 5684298	Date Analysis Commenced	: 16-Dec-2016
C-O-C number	: ----	Issue Date	: 23-Dec-2016 16:39
Sampler	: Chris V.		
Site	: ----		
Quote number	: SY/662/16 V3		
No. of samples received	: 2		
No. of samples analysed	: 2		

NATA

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Diana Mesa	2IC Organic Chemist	Brisbane Organics, Stafford, QLD
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- EG093: Samples ES1629089 #001, 002 were run on EG094 method due to low TDS content.
- EP050: The MBAS reported is calculated as LAS, mol wt ___342____.
- Total PAH reported as the sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene and Benzo(g,h,i)perylene.
- EP075: 'Sum of PAH' is the sum of the USEPA 16 priority PAHs
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 2**	**Prospect Creek up stream**	**----**	**----**	**----**
			Client sampling date / time	[16-Dec-2016]	[16-Dec-2016]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1629089-001**	**ES1629089-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**8.14**	**7.64**	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**333**	**653**	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**26**	**8**	----	----	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	**30.6**	**6.6**	----	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	**72**	**140**	----	----	----
EA075: Redox Potential								
Redox Potential	----	0.1	mV	**261**	**264**	----	----	----
pH Redox	----	0.01	pH Unit	**8.01**	**7.80**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**37**	**175**	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**40**	**64**	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**24**	**23**	----	----	----
Magnesium	7439-95-4	1	mg/L	**3**	**20**	----	----	----
Sodium	7440-23-5	1	mg/L	**30**	**104**	----	----	----
Potassium	7440-09-7	1	mg/L	**11**	**2**	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Gallium	7440-55-3	0.001	mg/L	<0.001	<0.001	----	----	----
Lanthanum	7439-91-0	0.001	mg/L	<0.001	<0.001	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.00004	mg/L	<0.00004	<0.00004	----	----	----
EG049G LL-F: Dissolved Trivalent Chromium - Low Level								
Trivalent Chromium	16065-83-1	0.001	mg/L	**0.001**	<0.001	----	----	----
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level								
Hexavalent Chromium	18540-29-9	0.001	mg/L	**0.004**	<0.001	----	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								
Aluminium	7429-90-5	5	µg/L	**172**	**13**	----	----	----
Arsenic	7440-38-2	0.5	µg/L	**1.0**	<0.5	----	----	----

Analytical Results

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

Compound	CAS Number	LOR	Unit	Dam 2	Prospect Creek up stream	----	----	----
Client sampling date / time				[16-Dec-2016]	[16-Dec-2016]	----	----	----
				ES1629089-001	**ES1629089-002**	--------	--------	--------
				Result	Result	----	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS - Continued								
Barium	7440-39-3	1	µg/L	**9**	**49**	----	----	----
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	----	----	----
Boron	7440-42-8	100	µg/L	<100	<100	----	----	----
Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	----	----	----
Chromium	7440-47-3	0.5	µg/L	**5.0**	<0.5	----	----	----
Cobalt	7440-48-4	0.2	µg/L	<0.2	**0.2**	----	----	----
Copper	7440-50-8	1	µg/L	**12**	**6**	----	----	----
Iron	7439-89-6	5	µg/L	**8**	**45**	----	----	----
Lead	7439-92-1	0.2	µg/L	<0.2	<0.2	----	----	----
Manganese	7439-96-5	0.5	µg/L	**0.9**	**45.7**	----	----	----
Molybdenum	7439-98-7	0.1	µg/L	**5.7**	**1.1**	----	----	----
Nickel	7440-02-0	0.5	µg/L	**0.8**	**2.0**	----	----	----
Selenium	7782-49-2	2	µg/L	<2	<2	----	----	----
Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	----	----	----
Strontium	7440-24-6	10	µg/L	**100**	**210**	----	----	----
Thallium	7440-28-0	0.1	µg/L	<0.1	<0.1	----	----	----
Tin	7440-31-5	5	µg/L	<5	<5	----	----	----
Uranium	7440-61-1	0.1	µg/L	**0.2**	<0.1	----	----	----
Vanadium	7440-62-2	0.5	µg/L	**15.9**	**0.7**	----	----	----
Zinc	7440-66-6	5	µg/L	<5	**12**	----	----	----
EK010-1: Chlorine								
Total Residual Chlorine	----	0.02	mg/L	<0.02	**0.05**	----	----	----
EK025SF: Free CN by Segmented Flow Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	<0.004	----	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	----	----	----
EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser								
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	----	----	----
EK084: Un-ionized Hydrogen Sulfide								
Unionized Hydrogen Sulfide	----	0.1	mg/L	<0.1	<0.1	----	----	----
EK255A: Ammonia								
Ammonia as N	7664-41-7	0.005	mg/L	**0.031**	**0.016**	----	----	----
EK257A: Nitrite								
Nitrite as N	14797-65-0	0.002	mg/L	**0.100**	**0.006**	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**Dam 2**	**Prospect Creek up stream**	----	----	----
			Client sampling date / time	[16-Dec-2016]	[16-Dec-2016]	----	----	----
Compound	CAS Number	LOR	Unit	**ES1629089-001**	**ES1629089-002**	--------	--------	--------
				Result	Result	----	----	----
EK257A: Nitrite - Continued								
EK258A: Nitrate								
Nitrate as N	14797-55-8	0.002	mg/L	**0.382**	**0.222**	----	----	----
EK259A: Nitrite and Nitrate (NOx)								
Nitrite + Nitrate as N	----	0.002	mg/L	**0.482**	**0.228**	----	----	----
EK261A: Total Kjeldahl Nitrogen								
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	**0.68**	**0.51**	----	----	----
EK262A: Total Nitrogen								
Total Nitrogen as N	----	0.01	mg/L	**1.16**	**0.74**	----	----	----
EK267A: Total Phosphorus (Persulfate Digestion)								
Total Phosphorus as P	----	0.005	mg/L	**0.008**	**0.020**	----	----	----
EP020: Oil and Grease (O&G)								
Oil & Grease	----	5	mg/L	<5	<5	----	----	----
EP050: Anionic Surfactants as MBAS								
Anionic Surfactants as MBAS	----	0.1	mg/L	**0.1**	<0.1	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1	µg/L	<1.0	**3.1**	----	----	----
2-Chlorophenol	95-57-8	1	µg/L	<1.0	<1.0	----	----	----
2-Methylphenol	95-48-7	1	µg/L	<1.0	<1.0	----	----	----
3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	<2.0	----	----	----
2-Nitrophenol	88-75-5	1	µg/L	<1.0	<1.0	----	----	----
2.4-Dimethylphenol	105-67-9	1	µg/L	<1.0	<1.0	----	----	----
2.4-Dichlorophenol	120-83-2	1	µg/L	<1.0	<1.0	----	----	----
2.6-Dichlorophenol	87-65-0	1	µg/L	<1.0	<1.0	----	----	----
4-Chloro-3-methylphenol	59-50-7	1	µg/L	<1.0	<1.0	----	----	----
2.4.6-Trichlorophenol	88-06-2	1	µg/L	<1.0	<1.0	----	----	----
2.4.5-Trichlorophenol	95-95-4	1	µg/L	<1.0	<1.0	----	----	----
Pentachlorophenol	87-86-5	2	µg/L	<2.0	<2.0	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	----	----	----
Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	----	----	----
Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	----	----	----
Fluorene	86-73-7	1	µg/L	<1.0	<1.0	----	----	----
Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**Dam 2**	**Prospect Creek up stream**	**----**	**----**	**----**
			Client sampling date / time	[16-Dec-2016]	[16-Dec-2016]	----	----	----
Compound	CAS Number	LOR	Unit	**ES1629089-001**	**ES1629089-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Anthracene	120-12-7	1	µg/L	<1.0	<1.0	----	----	----
Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	----	----	----
Pyrene	129-00-0	1	µg/L	<1.0	<1.0	----	----	----
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	----	----	----
Chrysene	218-01-9	1	µg/L	<1.0	<1.0	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	<1.0	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	<1.0	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	<0.5	----	----	----
EP075C: Phthalate Esters								
Dimethyl phthalate	131-11-3	2	µg/L	<2	<2	----	----	----
Diethyl phthalate	84-66-2	2	µg/L	<2	<2	----	----	----
Di-n-butyl phthalate	84-74-2	2	µg/L	<2	<2	----	----	----
Butyl benzyl phthalate	85-68-7	2	µg/L	<2	<2	----	----	----
bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L	<10	<10	----	----	----
Di-n-octylphthalate	117-84-0	2	µg/L	<2	<2	----	----	----
EP075G: Chlorinated Hydrocarbons								
1.3-Dichlorobenzene	541-73-1	2	µg/L	<2	<2	----	----	----
1.4-Dichlorobenzene	106-46-7	2	µg/L	<2	<2	----	----	----
1.2-Dichlorobenzene	95-50-1	2	µg/L	<2	<2	----	----	----
Hexachloroethane	67-72-1	2	µg/L	<2	<2	----	----	----
1.2.4-Trichlorobenzene	120-82-1	2	µg/L	<2	<2	----	----	----
Hexachloropropylene	1888-71-7	2	µg/L	<2	<2	----	----	----
Hexachlorobutadiene	87-68-3	2	µg/L	<2	<2	----	----	----
Hexachlorocyclopentadiene	77-47-4	10	µg/L	<10	<10	----	----	----
Pentachlorobenzene	608-93-5	2	µg/L	<2	<2	----	----	----
Hexachlorobenzene (HCB)	118-74-1	4	µg/L	<4	<4	----	----	----
EP075H: Anilines and Benzidines								
Aniline	62-53-3	2	µg/L	<2	<2	----	----	----
4-Chloroaniline	106-47-8	2	µg/L	<2	<2	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 2**	**Prospect Creek up stream**	----	----	----
			Client sampling date / time	[16-Dec-2016]	[16-Dec-2016]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1629089-001**	**ES1629089-002**	--------	--------	--------
				Result	Result	----	----	----
EP075H: Anilines and Benzidines - Continued								
2-Nitroaniline	88-74-4	4	µg/L	<4	<4	----	----	----
3-Nitroaniline	99-09-2	4	µg/L	<4	<4	----	----	----
Dibenzofuran	132-64-9	2	µg/L	<2	<2	----	----	----
4-Nitroaniline	100-01-6	2	µg/L	<2	<2	----	----	----
Carbazole	86-74-8	2	µg/L	<2	<2	----	----	----
3.3`-Dichlorobenzidine	91-94-1	2	µg/L	<2	<2	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	<20	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	<100	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	<100	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	----	----	----
Toluene	108-88-3	2	µg/L	<2	<2	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	----	----	----
^ **Total Xylenes**	1330-20-7	2	µg/L	<2	<2	----	----	----
^ **Sum of BTEX**	----	1	µg/L	<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	<5	----	----	----
EP094A: Synthetic Pyrethroids								
Bioresmethrin	28434-01-07	0.5	µg/L	<0.5	<0.5	----	----	----
Bifenthrin	82657-04-3	0.5	µg/L	<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**Dam 2**	**Prospect Creek up stream**	----	----	----
			Client sampling date / time	[16-Dec-2016]	[16-Dec-2016]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1629089-001**	**ES1629089-002**	--------	--------	--------
				Result	Result	----	----	----
EP094A: Synthetic Pyrethroids - Continued								
Phenothrin	26002-80-2	0.5	µg/L	<0.5	<0.5	----	----	----
Lambda-cyhalothrin	68085-85-8	0.5	µg/L	<0.5	<0.5	----	----	----
Permethrin	52645-53-1	0.5	µg/L	<0.5	<0.5	----	----	----
Cyfluthrin	68359-37-5	0.5	µg/L	<0.5	<0.5	----	----	----
Cypermethrin	52315-07-8	0.5	µg/L	<0.5	<0.5	----	----	----
Fenvalverate & Esfenvalerate	51630-58-1/66230-04-	0.5	µg/L	<0.5	<0.5	----	----	----
Deltamethrin & Tralomethrin	62229-77-0/66841-25-	0.5	µg/L	<0.5	<0.5	----	----	----
Allethrin	----	0.5	µg/L	<0.5	<0.5	----	----	----
Transfluthrin	118712-89-3	0.5	µg/L	<0.5	<0.5	----	----	----
Tau-fluvalinate	----	0.5	µg/L	<0.5	<0.5	----	----	----
Tetramethrin	----	0.5	µg/L	<0.5	<0.5	----	----	----
EP094B: Synergist								
Piperonyl Butoxide	63993-73-7	0.5	µg/L	<0.5	<0.5	----	----	----
EP117: Alcohols								
Ethanol	64-17-5	50	µg/L	<50	<50	----	----	----
Isopropanol	67-63-0	50	µg/L	<50	<50	----	----	----
n-Propanol	71-23-8	50	µg/L	<50	<50	----	----	----
Isobutanol	78-83-1	50	µg/L	<50	<50	----	----	----
n-Butanol	71-36-3	50	µg/L	<50	<50	----	----	----
EP125A: Monocyclic Aromatic Hydrocarbons								
Benzene	71-43-2	0.05	µg/L	<0.05	<0.05	----	----	----
Toluene	108-88-3	0.5	µg/L	**0.9**	**1.0**	----	----	----
Ethylbenzene	100-41-4	0.05	µg/L	**0.06**	**0.09**	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.05	µg/L	**0.21**	**0.35**	----	----	----
Styrene	100-42-5	0.05	µg/L	<0.05	<0.05	----	----	----
ortho-Xylene	95-47-6	0.05	µg/L	**0.05**	**0.07**	----	----	----
1.3.5-Trimethylbenzene	108-67-8	0.05	µg/L	<0.05	<0.05	----	----	----
1.2.4-Trimethylbenzene	95-63-6	0.05	µg/L	<0.05	<0.05	----	----	----
EP125D: Fumigants								
1.2-Dichloropropane	78-87-5	0.1	µg/L	<0.1	<0.1	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.1	µg/L	<0.1	<0.1	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.1	µg/L	<0.1	<0.1	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**Dam 2**	**Prospect Creek up stream**	**----**	**----**	**----**
			Client sampling date / time	[16-Dec-2016]	[16-Dec-2016]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1629089-001**	**ES1629089-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP125D: Fumigants - Continued								
1.2-Dibromoethane (EDB)	106-93-4	0.1	µg/L	<0.1	<0.1	----	----	----
EP125E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	0.5	µg/L	<0.5	<0.5	----	----	----
Vinyl chloride	75-01-4	0.3	µg/L	<0.3	<0.3	----	----	----
Bromomethane	74-83-9	0.5	µg/L	<0.5	<0.5	----	----	----
Chloroethane	75-00-3	0.5	µg/L	<0.5	<0.5	----	----	----
Trichlorofluoromethane	75-69-4	0.5	µg/L	<0.5	<0.5	----	----	----
1.1-Dichloroethene	75-35-4	0.1	µg/L	<0.1	<0.1	----	----	----
Dichloromethane	75-09-2	1	µg/L	<1.0	<1.0	----	----	----
trans-1.2-Dichloroethene	156-60-5	0.1	µg/L	<0.1	<0.1	----	----	----
1.1-Dichloroethane	75-34-3	0.1	µg/L	<0.1	<0.1	----	----	----
cis-1.2-Dichloroethene	156-59-2	0.1	µg/L	<0.1	<0.1	----	----	----
Bromochloromethane	74-97-5	0.5	µg/L	<0.5	<0.5	----	----	----
1.2-Dichloroethane	107-06-2	0.1	µg/L	<0.1	<0.1	----	----	----
1.1.1-Trichloroethane	71-55-6	0.1	µg/L	<0.1	<0.1	----	----	----
Carbon Tetrachloride	56-23-5	0.05	µg/L	<0.05	<0.05	----	----	----
Trichloroethene	79-01-6	0.05	µg/L	<0.05	<0.05	----	----	----
Tetrachloroethene	127-18-4	0.05	µg/L	<0.05	<0.05	----	----	----
Hexachlorobutadiene	87-68-3	0.04	µg/L	<0.04	<0.04	----	----	----
EP125F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	0.1	µg/L	**0.30**	<0.10	----	----	----
Bromobenzene	108-86-1	0.1	µg/L	<0.10	<0.10	----	----	----
Benzylchloride	100-44-7	0.2	µg/L	<0.2	<0.2	----	----	----
1.3-Dichlorobenzene	541-73-1	0.1	µg/L	<0.10	<0.10	----	----	----
1.4-Dichlorobenzene	106-46-7	0.1	µg/L	<0.10	<0.10	----	----	----
1.2-Dichlorobenzene	95-50-1	0.1	µg/L	<0.10	<0.10	----	----	----
2-Chlorotoluene	95-49-8	0.1	µg/L	<0.1	<0.1	----	----	----
4-Chlorotoluene	106-43-4	0.1	µg/L	<0.1	<0.1	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.1	µg/L	<0.1	<0.1	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.1	µg/L	<0.1	<0.1	----	----	----
^ **Trichlorobenzenes (Sum)**	----	0.1	µg/L	<0.1	<0.1	----	----	----
EP125G: Trihalomethanes								
Chloroform	67-66-3	0.1	µg/L	**1.49**	<0.10	----	----	----
Bromodichloromethane	75-27-4	0.1	µg/L	**0.57**	<0.10	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**Dam 2**	**Prospect Creek up stream**	----	----	----
			Client sampling date / time	[16-Dec-2016]	[16-Dec-2016]	----	----	----
Compound	CAS Number	LOR	Unit	**ES1629089-001**	**ES1629089-002**	--------	--------	--------
				Result	Result	----	----	----
EP125G: Trihalomethanes - Continued								
Dibromochloromethane	124-48-1	0.1	µg/L	**0.14**	<0.10	----	----	----
Bromoform	75-25-2	0.1	µg/L	<0.10	<0.10	----	----	----
^ **Total Trihalomethanes**	----	0.1	µg/L	**2.20**	<0.10	----	----	----
EP125H: Naphthalene								
Naphthalene	91-20-3	0.05	µg/L	<0.05	<0.05	----	----	----
EP125L: Methyl t-butyl ether								
Methyl tert-butyl ether (MTBE)	1634-04-4	0.1	µg/L	<0.1	<0.1	----	----	----
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.01	µg/L	<0.010	<0.010	----	----	----
alpha-BHC	319-84-6	0.01	µg/L	<0.010	<0.010	----	----	----
beta-BHC	319-85-7	0.01	µg/L	<0.010	<0.010	----	----	----
delta-BHC	319-86-8	0.01	µg/L	<0.010	<0.010	----	----	----
4.4`-DDD	72-54-8	0.01	µg/L	<0.010	<0.010	----	----	----
4.4`-DDE	72-55-9	0.01	µg/L	<0.010	<0.010	----	----	----
4.4`-DDT	50-29-3	0.01	µg/L	<0.010	<0.010	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.01	µg/L	<0.010	<0.010	----	----	----
Dieldrin	60-57-1	0.01	µg/L	<0.010	<0.010	----	----	----
alpha-Endosulfan	959-98-8	0.01	µg/L	<0.010	<0.010	----	----	----
beta-Endosulfan	33213-65-9	0.01	µg/L	<0.010	<0.010	----	----	----
Endosulfan sulfate	1031-07-8	0.01	µg/L	<0.010	<0.010	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.01	µg/L	<0.010	<0.010	----	----	----
Endrin	72-20-8	0.01	µg/L	<0.010	<0.010	----	----	----
Endrin aldehyde	7421-93-4	0.01	µg/L	<0.010	<0.010	----	----	----
Endrin ketone	53494-70-5	0.01	µg/L	<0.010	<0.010	----	----	----
Heptachlor	76-44-8	0.005	µg/L	<0.005	<0.005	----	----	----
Heptachlor epoxide	1024-57-3	0.01	µg/L	<0.010	<0.010	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.01	µg/L	<0.010	<0.010	----	----	----
gamma-BHC	58-89-9	0.01	µg/L	<0.010	<0.010	----	----	----
Methoxychlor	72-43-5	0.01	µg/L	<0.010	<0.010	----	----	----
cis-Chlordane	5103-71-9	0.01	µg/L	<0.010	<0.010	----	----	----
trans-Chlordane	5103-74-2	0.01	µg/L	<0.010	<0.010	----	----	----
^ **Total Chlordane (sum)**	----	0.01	µg/L	<0.010	<0.010	----	----	----
Oxychlordane	27304-13-8	0.01	µg/L	<0.010	<0.010	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 2**	**Prospect Creek up stream**	**----**	**----**	**----**
			Client sampling date / time	[16-Dec-2016]	[16-Dec-2016]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1629089-001**	**ES1629089-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP131B: Polychlorinated Biphenyls (as Aroclors)								
Total Polychlorinated biphenyls	----	0.1	µg/L	<0.10	<0.10	----	----	----
Aroclor 1016	12674-11-2	0.1	µg/L	<0.10	<0.10	----	----	----
Aroclor 1221	11104-28-2	0.1	µg/L	<0.10	<0.10	----	----	----
Aroclor 1232	11141-16-5	0.1	µg/L	<0.10	<0.10	----	----	----
Aroclor 1242	53469-21-9	0.1	µg/L	<0.10	<0.10	----	----	----
Aroclor 1248	12672-29-6	0.1	µg/L	<0.10	<0.10	----	----	----
Aroclor 1254	11097-69-1	0.1	µg/L	<0.10	<0.10	----	----	----
Aroclor 1260	11096-82-5	0.1	µg/L	<0.10	<0.10	----	----	----
EP132C: Chlorinated Naphthalenes								
1-Chloronaphthalene	90-13-1	0.1	µg/L	<0.1	<0.1	----	----	----
2-Chloronaphthalene	91-58-7	0.1	µg/L	<0.1	<0.1	----	----	----
^ **Chloronaphthalenes (1- + 2-)**	----	0.1	µg/L	<0.1	<0.1	----	----	----
EP203A: Explosives								
HMX	2691-41-0	1	µg/L	<1.0	<1.0	----	----	----
RDX	----	1	µg/L	<1.0	<1.0	----	----	----
1.3.5-Trinitrobenzene	99-35-4	1	µg/L	<1.0	<1.0	----	----	----
1.3-Dinitrobenzene	99-65-0	1	µg/L	<1.0	<1.0	----	----	----
Tetryl	479-45-8	1	µg/L	<1.0	<1.0	----	----	----
2.4.6-TNT	118-96-7	1	µg/L	<1.0	<1.0	----	----	----
4-Amino.2.6-DNT	19406-51-0	1	µg/L	<1.0	<1.0	----	----	----
2-Amino-4.6-DNT	35572-78-2	1	µg/L	<1.0	<1.0	----	----	----
4-& 2-AM-DNT(Isomeric Mixture)	----	1	µg/L	<1.0	<1.0	----	----	----
2.4-Dinitrotoluene	121-14-2	1	µg/L	<1.0	<1.0	----	----	----
2.6-Dinitrotoluene	606-20-2	1	µg/L	<1.0	<1.0	----	----	----
2.4-& 2.6-DNT(Isomeric Mixture)	51-28-5/606-20-2	1	µg/L	<1.0	<1.0	----	----	----
Nitrobenzene	98-95-3	1	µg/L	<1.0	<1.0	----	----	----
2-Nitrotoluene	88-72-2	1	µg/L	<1.0	<1.0	----	----	----
3-Nitrotoluene	99-08-1	1	µg/L	<1.0	<1.0	----	----	----
4-Nitrotoluene	99-99-0	1	µg/L	<1.0	<1.0	----	----	----
Nitroglycerine	55-63-0	5	µg/L	<5	<5	----	----	----
PETN	78-11-5	5	µg/L	<5	<5	----	----	----
EP234: Multiresidue Pesticides (ESI Positive)								
3-Hydroxy Carbofuran	16655-82-6	0.02	µg/L	<0.02	<0.02	----	----	----
Abamectin	71751-41-2	0.1	µg/L	<0.1	<0.1	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**Dam 2**	**Prospect Creek up stream**	**----**	**----**	**----**
			Client sampling date / time	[16-Dec-2016]	[16-Dec-2016]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1629089-001**	**ES1629089-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Acephate	30560-19-1	0.5	µg/L	<0.5	<0.5	----	----	----
Alachlor	15972-60-8	0.1	µg/L	<0.1	<0.1	----	----	----
Aldicarb	116-06-3	0.05	µg/L	<0.05	<0.05	----	----	----
Ametryn	834-12-8	0.01	µg/L	<0.01	<0.01	----	----	----
Aminopyralid	150114-71-9	0.1	µg/L	<0.1	<0.1	----	----	----
Amitraz	33089-61-1	100	µg/L	<100	<100	----	----	----
Atrazine	1912-24-9	0.01	µg/L	**0.02**	<0.01	----	----	----
Atrazine-desethyl	6190-65-4	0.1	µg/L	<0.1	<0.1	----	----	----
Atrazine-desisopropyl	1007-28-9	0.1	µg/L	<0.1	<0.1	----	----	----
Azinphos-ethyl	2642-71-9	0.02	µg/L	<0.02	<0.02	----	----	----
Azinphos-methyl	86-50-0	0.02	µg/L	<0.02	<0.02	----	----	----
Azoxystrobin	131860-33-8	0.1	µg/L	<0.1	<0.1	----	----	----
Bendiocarb	22781-23-3	0.1	µg/L	<0.10	<0.10	----	----	----
Benomyl	17804-35-2	0.01	µg/L	**0.19**	<0.01	----	----	----
Bensulfuron methyl	83055-99-6	0.1	µg/L	<0.1	<0.1	----	----	----
Bensulide	741-58-2	0.1	µg/L	<0.1	<0.1	----	----	----
Boscalid	188425-85-6	0.1	µg/L	<0.1	<0.1	----	----	----
Bromacil	314-40-9	0.02	µg/L	<0.02	<0.02	----	----	----
Bromophos-ethyl	4824-78-6	0.1	µg/L	<0.10	<0.10	----	----	----
Butachlor	23184-66-9	0.1	µg/L	<0.1	<0.1	----	----	----
Carbaryl	63-25-2	0.01	µg/L	<0.01	<0.01	----	----	----
Carbendazim (Thiophanate methyl)	10605-21-7	0.1	µg/L	**0.2**	<0.1	----	----	----
Carbofenothion	786-19-6	0.02	µg/L	<0.02	<0.02	----	----	----
Carbofuran	1563-66-2	0.01	µg/L	<0.01	<0.01	----	----	----
Carboxin	5234-68-4	0.1	µg/L	<0.1	<0.1	----	----	----
Carfentrazone-ethyl	128639-02-1	0.1	µg/L	<0.1	<0.1	----	----	----
Chlorantraniliprole	500008-45-7	0.1	µg/L	<0.1	<0.1	----	----	----
Chlorfenvinphos	470-90-6	0.02	µg/L	<0.02	<0.02	----	----	----
Chloroxuron	1982-47-4	0.1	µg/L	<0.1	<0.1	----	----	----
Chlorpyrifos	2921-88-2	0.02	µg/L	<0.02	<0.02	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.1	µg/L	<0.2	<0.2	----	----	----
Chlorsulfuron	64902-72-3	0.2	µg/L	<0.2	<0.2	----	----	----
Coumaphos	56-72-4	0.01	µg/L	<0.01	<0.01	----	----	----
Cyanazine	21725-46-2	0.02	µg/L	<0.02	<0.02	----	----	----

Analytical Results

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

			Client sample ID	**Dam 2**	**Prospect Creek up stream**	**----**	**----**	**----**
			Client sampling date / time	[16-Dec-2016]	[16-Dec-2016]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1629089-001**	**ES1629089-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Cyproconazole	94361-06-5	0.02	µg/L	<0.02	<0.02	----	----	----
Cyprodinil	121552-61-2	0.01	µg/L	<0.01	<0.01	----	----	----
Cyromazine	66215-27-8	0.05	µg/L	<0.05	<0.05	----	----	----
Demeton-O	298-03-0	0.02	µg/L	<0.02	<0.02	----	----	----
Demeton-O & Demeton-S	298-03-3/126-75-0	0.02	µg/L	<0.02	<0.02	----	----	----
Demeton-S	126-75-0	0.02	µg/L	<0.02	<0.02	----	----	----
Demeton-S-methyl	919-86-8	0.02	µg/L	<0.02	<0.02	----	----	----
Diazinon	333-41-5	0.01	µg/L	<0.01	<0.01	----	----	----
Dichlobenil	1194-65-6	0.1	µg/L	<0.1	<0.1	----	----	----
Dichlorvos	62-73-7	0.2	µg/L	<0.20	<0.20	----	----	----
Diclofop-methyl	51338-27-3	0.05	µg/L	<0.05	<0.05	----	----	----
Difenoconazole	119446-68-3	0.02	µg/L	<0.02	<0.02	----	----	----
Diflubenzuron	35367-38-5	0.1	µg/L	<0.1	<0.1	----	----	----
Dimethoate	60-51-5	0.02	µg/L	<0.02	<0.02	----	----	----
Diphenamid	957-51-7	0.1	µg/L	<0.1	<0.1	----	----	----
Disulfoton	298-04-4	0.05	µg/L	<0.05	<0.05	----	----	----
Diuron	330-54-1	0.02	µg/L	<0.02	<0.02	----	----	----
EPN	2104-64-5	0.05	µg/L	<0.05	<0.05	----	----	----
EPTC	759-94-4	0.1	µg/L	<0.1	<0.1	----	----	----
Ethion	563-12-2	0.02	µg/L	<0.02	<0.02	----	----	----
Ethoprophos	13194-48-4	0.01	µg/L	<0.01	<0.01	----	----	----
Etridiazole	2593-15-9	0.5	µg/L	<0.5	<0.5	----	----	----
Fenamiphos	22224-92-6	0.01	µg/L	<0.01	<0.01	----	----	----
Fenarimol	60168-88-9	0.02	µg/L	<0.02	<0.02	----	----	----
Fenchlorphos (Ronnel)	299-84-3	10	µg/L	<10	<10	----	----	----
Fenitrothion	122-14-5	2	µg/L	<2	<2	----	----	----
Fenoxycarb	79127-80-3	0.1	µg/L	<0.1	<0.1	----	----	----
Fensulfothion	115-90-2	0.01	µg/L	<0.01	<0.01	----	----	----
Fenthion	55-38-9	0.05	µg/L	<0.05	<0.05	----	----	----
Flamprop methyl	52756-25-9	0.1	µg/L	<0.1	<0.1	----	----	----
Fluometuron	2164-17-2	0.01	µg/L	<0.01	<0.01	----	----	----
Flusilazole	85509-19-9	0.02	µg/L	<0.02	<0.02	----	----	----
Formothion	2540-82-1	20	µg/L	<20	<20	----	----	----
Fosetyl Aluminium	39148-24-8	10	µg/L	<10	<10	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 2**	**Prospect Creek up stream**	----	----	----
			Client sampling date / time	[16-Dec-2016]	[16-Dec-2016]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1629089-001**	**ES1629089-002**	--------	--------	--------
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Haloxyfop	69806-34-4	0.1	µg/L	<0.1	<0.1	----	----	----
Hexaconazole	79983-71-4	0.02	µg/L	<0.02	<0.02	----	----	----
Hexazinone	51235-04-2	0.02	µg/L	<0.02	<0.02	----	----	----
Imazapyr	94795-74-1	10	µg/L	<10.0	<10.0	----	----	----
Indoxacarb	173584-44-6	0.1	µg/L	<0.1	<0.1	----	----	----
Iodosulfuron methyl	144550-36-7	0.1	µg/L	<0.1	<0.1	----	----	----
Irgarol	28159-98-0	0.002	µg/L	<0.002	<0.002	----	----	----
Isoproturon	34123-59-6	0.1	µg/L	<0.1	<0.1	----	----	----
Malathion	121-75-5	0.02	µg/L	<0.02	<0.02	----	----	----
Metalaxyl	57837-19-1	0.1	µg/L	<0.1	<0.1	----	----	----
Metalaxyl-M	70630-17-0	0.1	µg/L	<0.1	<0.1	----	----	----
Metaldehyde	108-62-3	10	µg/L	<10	<10	----	----	----
Methidathion	950-37-8	0.1	µg/L	<0.1	<0.1	----	----	----
Methiocarb	2032-65-7	0.01	µg/L	<0.01	<0.01	----	----	----
Methomyl	16752-77-5	0.01	µg/L	<0.01	<0.01	----	----	----
Metolachlor	51218-45-2	0.01	µg/L	**0.02**	<0.01	----	----	----
Metribuzin	21087-64-9	0.02	µg/L	<0.02	<0.02	----	----	----
Mevinphos	7786-34-7	0.02	µg/L	<0.02	<0.02	----	----	----
Molinate	2212-67-1	0.1	µg/L	<0.1	<0.1	----	----	----
Monocrotophos	6923-22-4	0.02	µg/L	<0.02	<0.02	----	----	----
Myclobutanil	88671-89-0	0.1	µg/L	<0.1	<0.1	----	----	----
Naftalofos	1491-41-4	1	µg/L	<1.0	<1.0	----	----	----
Napropamide	15299-99-7	0.1	µg/L	<0.1	<0.1	----	----	----
Nitralin	4726-14-1	0.1	µg/L	<0.1	<0.1	----	----	----
Norflurazon	27314-13-2	0.1	µg/L	<0.1	<0.1	----	----	----
Novaluron	116714-46-6	0.1	µg/L	<0.1	<0.1	----	----	----
Omethoate	1113-02-6	0.01	µg/L	<0.01	<0.01	----	----	----
Oxamyl	23135-22-0	0.01	µg/L	<0.01	<0.01	----	----	----
Oxyfluorfen	42874-03-3	1	µg/L	<1.0	<1.0	----	----	----
Paclobutrazole	76738-62-0	0.05	µg/L	<0.05	<0.05	----	----	----
Parathion	56-38-2	0.2	µg/L	<0.2	<0.2	----	----	----
Parathion-methyl	298-00-0	0.5	µg/L	<0.5	<0.5	----	----	----
Pebulate	1114-71-2	0.1	µg/L	<0.1	<0.1	----	----	----
Penconazole	66246-88-6	0.01	µg/L	<0.01	<0.01	----	----	----

Analytical Results

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

			Client sample ID	**Dam 2**	**Prospect Creek up stream**	----	----	----
			Client sampling date / time	[16-Dec-2016]	[16-Dec-2016]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1629089-001**	**ES1629089-002**	--------	--------	--------
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Pendimethalin	40487-42-1	0.05	µg/L	<0.05	<0.05	----	----	----
Phorate	298-02-2	0.1	µg/L	<0.1	<0.1	----	----	----
Pirimicarb	23103-98-2	0.1	µg/L	<0.1	<0.1	----	----	----
Pirimiphos-ethyl	23505-41-1	0.01	µg/L	<0.01	<0.01	----	----	----
Pirimiphos-methyl	29232-93-7	0.01	µg/L	<0.01	<0.01	----	----	----
Prochloraz	67747-09-5	0.1	µg/L	<0.1	<0.1	----	----	----
Profenofos	41198-08-7	0.01	µg/L	<0.01	<0.01	----	----	----
Promecarb	2631-37-0	0.1	µg/L	<0.1	<0.1	----	----	----
Prometryn	7287-19-6	0.01	µg/L	<0.01	<0.01	----	----	----
Propachlor	1918-16-7	0.1	µg/L	<0.1	<0.1	----	----	----
Propamocarb	24579-73-5	0.1	µg/L	<0.1	<0.1	----	----	----
Propargite	2312-35-8	0.1	µg/L	<0.1	<0.1	----	----	----
Propazine	139-40-2	0.01	µg/L	<0.01	<0.01	----	----	----
Propiconazole	60207-90-1	0.05	µg/L	<0.05	<0.05	----	----	----
Propyzamide	23950-58-5	0.1	µg/L	<0.1	<0.1	----	----	----
Prothiofos	34643-46-4	0.1	µg/L	<0.1	<0.1	----	----	----
Pyraclostrobin	175013-18-0	0.1	µg/L	<0.1	<0.1	----	----	----
Pyrazophos	13457-18-6	0.1	µg/L	<0.1	<0.1	----	----	----
Pyrimethanil	53112-28-0	0.02	µg/L	<0.02	<0.02	----	----	----
Pyriproxyfen	95737-68-1	0.1	µg/L	<0.1	<0.1	----	----	----
Pyroxsulam	422556-08-9	0.1	µg/L	<0.1	<0.1	----	----	----
Quinclorac	84087-01-4	0.1	µg/L	<0.1	<0.1	----	----	----
Rimsulfuron	122931-48-0	0.1	µg/L	<0.1	<0.1	----	----	----
Siduron	1982-49-6	0.1	µg/L	<0.1	<0.1	----	----	----
Simazine	122-34-9	0.02	µg/L	**0.04**	<0.02	----	----	----
Spirotetramat	203313-25-1	0.1	µg/L	<0.1	<0.1	----	----	----
Sulfotep	3689-24-5	0.005	µg/L	<0.005	<0.005	----	----	----
Sulprofos	35400-43-2	0.05	µg/L	<0.05	<0.05	----	----	----
Tebuconazole	107534-96-3	0.01	µg/L	<0.01	<0.01	----	----	----
Tebuthiuron	34014-18-1	0.02	µg/L	<0.02	<0.02	----	----	----
Temephos	3383-96-8	0.02	µg/L	<0.02	<0.02	----	----	----
Terbacil	5902-51-2	0.1	µg/L	<0.1	<0.1	----	----	----
Terbufos	13071-79-9	0.01	µg/L	<0.01	<0.01	----	----	----
Terbuthylazine	5915-41-3	0.01	µg/L	<0.01	<0.01	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 2**	**Prospect Creek up stream**	**----**	**----**	**----**
			Client sampling date / time	[16-Dec-2016]	[16-Dec-2016]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1629089-001**	**ES1629089-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Terbutryn	886-50-0	0.01	µg/L	<0.01	<0.01	----	----	----
Tetrachlorvinphos	22248-79-9	0.01	µg/L	<0.01	<0.01	----	----	----
Tetraconazole	112281-77-3	0.1	µg/L	<0.1	<0.1	----	----	----
Thiamethoxam	153719-23-4	0.02	µg/L	<0.02	<0.02	----	----	----
Thiobencarb	28249-77-6	0.01	µg/L	<0.01	<0.01	----	----	----
Thiodicarb	59669-26-0	0.01	µg/L	<0.01	<0.01	----	----	----
Thiometon	640-15-3	0.5	µg/L	<0.5	<0.5	----	----	----
Toltrazuril	69004-03-1	0.5	µg/L	<0.5	<0.5	----	----	----
Triadimefon	43121-43-3	0.1	µg/L	<0.1	<0.1	----	----	----
Triadimenol	55219-65-3	0.1	µg/L	<0.1	<0.1	----	----	----
Triazophos	24017-47-8	0.005	µg/L	<0.005	<0.005	----	----	----
Trichlorfon	52-68-6	0.02	µg/L	<0.02	<0.02	----	----	----
Trichloronate	327-98-0	0.5	µg/L	<0.5	<0.5	----	----	----
Trifloxystrobin	141517-21-7	0.1	µg/L	<0.1	<0.1	----	----	----
Trifloxysulfuron-sodium	199119-58-9	0.1	µg/L	<0.1	<0.1	----	----	----
Trifluralin	1582-09-8	10	µg/L	<10.0	<10.0	----	----	----
Trinexapac Ethyl	95266-40-3	1	µg/L	<1	<1	----	----	----
Vernolate	1929-77-7	0.1	µg/L	<0.1	<0.1	----	----	----
EP247: Phenolics and Related Compounds								
2,4-Dinitrophenol	51-28-5	0.01	µg/L	**0.01**	**0.02**	----	----	----
2-Methyl-4.6-dinitrophenol	8071-51-0	0.05	µg/L	<0.05	<0.05	----	----	----
4-Nonylphenol (mixture of isomers)	84852-15-3	0.1	µg/L	<0.10	<0.10	----	----	----
Hexachlorophene	70-30-4	0.1	µg/L	<0.10	<0.10	----	----	----
4-Nitrophenol	100-02-7	0.1	µg/L	**0.24**	<0.10	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.1	µg/L	<0.10	<0.10	----	----	----
Pentachlorophenol	87-86-5	0.1	µg/L	<0.10	<0.10	----	----	----
Dinoseb	88-85-7	0.1	µg/L	<0.10	<0.10	----	----	----
Dalapon	75-99-0	0.1	µg/L	<0.10	<0.10	----	----	----
Bisphenol-A	80-05-7	0.05	µg/L	<0.05	<0.05	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	**18.4**	**16.8**	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%	**37.9**	**40.4**	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%	**37.6**	**41.8**	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 2**	**Prospect Creek up stream**	**----**	**----**	**----**
			Client sampling date / time	[16-Dec-2016]	[16-Dec-2016]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1629089-001**	**ES1629089-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	**68.2**	**70.8**	----	----	----
Anthracene-d10	1719-06-8	1	%	**90.2**	**92.0**	----	----	----
4-Terphenyl-d14	1718-51-0	1	%	**92.0**	**90.3**	----	----	----
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	2	%	**23.4**	**38.9**	----	----	----
Phenol-d6	13127-88-3	2	%	**25.7**	**29.0**	----	----	----
2-Chlorophenol-D4	93951-73-6	2	%	**41.2**	**55.0**	----	----	----
2.4.6-Tribromophenol	118-79-6	2	%	**32.6**	**59.2**	----	----	----
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	2	%	**58.5**	**66.3**	----	----	----
1.2-Dichlorobenzene-D4	2199-69-1	2	%	**51.2**	**57.9**	----	----	----
2-Fluorobiphenyl	321-60-8	2	%	**68.3**	**70.7**	----	----	----
Anthracene-d10	1719-06-8	2	%	**75.4**	**78.1**	----	----	----
4-Terphenyl-d14	1718-51-0	2	%	**79.8**	**81.6**	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**113**	**116**	----	----	----
Toluene-D8	2037-26-5	2	%	**114**	**119**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**103**	**107**	----	----	----
EP094S: Pesticide Surrogate								
DEF	78-48-8	0.5	%	**91.6**	**86.2**	----	----	----
EP125S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**114**	**122**	----	----	----
Toluene-D8	2037-26-5	0.1	%	**116**	**116**	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**119**	**117**	----	----	----
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.01	%	**119**	**105**	----	----	----
EP131T: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	**116**	**110**	----	----	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**68.5**	**70.5**	----	----	----
Anthracene-d10	1719-06-8	0.1	%	**75.4**	**79.9**	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**73.5**	**78.8**	----	----	----
EP203S: Explosives Surrogate								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**Dam 2**	**Prospect Creek up stream**	**----**	**----**	**----**
			Client sampling date / time	[16-Dec-2016]	[16-Dec-2016]	----	----	----
Compound	CAS Number	LOR	Unit	**ES1629089-001**	**ES1629089-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP203S: Explosives Surrogate - Continued								
o-Dinitrobenzene	528-29-0	1	%	**117**	**81.9**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	*CAS Number*	*Recovery Limits (%)* *Low*	*High*
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	10	117
Phenol-d6	13127-88-3	10	69
2-Chlorophenol-D4	93951-73-6	21	130
2.4.6-Tribromophenol	118-79-6	10	151
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	29	142
1.2-Dichlorobenzene-D4	2199-69-1	24	121
2-Fluorobiphenyl	321-60-8	27	135
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	21	123
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128
EP094S: Pesticide Surrogate			
DEF	78-48-8	42	143
EP125S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	65	127
4-Bromofluorobenzene	460-00-4	68	124
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	14	166
EP131T: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	10	144
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	135
Anthracene-d10	1719-06-8	48	138
4-Terphenyl-d14	1718-51-0	48	144
EP203S: Explosives Surrogate			

Sub-Matrix: **WATER**

		Recovery Limits (%)	
Compound	*CAS Number*	***Low***	***High***
EP203S: Explosives Surrogate - Continued			
o-Dinitrobenzene	528-29-0	51	125

Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1702253**	Page	: 1 of 20
Client	: **BORAL RECYCLING - WIDEMERE**	Laboratory	: Environmental Division Sydney
Contact	: PHILIP PATERSON	Contact	: Customer Services ES
Address	: Boral Recycling Wetherill Park, NSW 2164	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: 02 9604 9101	Telephone	: +61-2-8784 8555
Project	: SURFACE WATER ANALYSIS	Date Samples Received	: 01-Feb-2017 16:30
Order number	: tba	Date Analysis Commenced	: 01-Feb-2017
C-O-C number	: ----	Issue Date	: 09-Feb-2017 15:54
Sampler	: CHRIS V.		
Site	: ----		
Quote number	: SY/662/16 V4		
No. of samples received	: 1		
No. of samples analysed	: 1		

NATA

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Dian Dao		Sydney Inorganics, Smithfield, NSW
Diana Mesa	2IC Organic Chemist	Brisbane Organics, Stafford, QLD
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- EG093: Sample ES1702253 #001 was run under EG094 method due to low TDS content.
- EP050: The MBAS reported is calculated as LAS, mol wt __342_____.
- Total PAH reported as the sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene and Benzo(g,h,i)perylene.
- EP075: 'Sum of PAH' is the sum of the USEPA 16 priority PAHs
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

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

			Client sample ID	**Dam 1 - Before Dredging**	**----**	**----**	**----**	**----**
			Client sampling date / time	01-Feb-2017 16:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702253-001**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**8.37**	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**377**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**39**	----	----	----	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	**25.9**	----	----	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	**82**	----	----	----	----
EA075: Redox Potential								
Redox Potential	----	0.1	mV	**148**	----	----	----	----
pH Redox	----	0.01	pH Unit	**8.64**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**43**	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**35**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**28**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	**3**	----	----	----	----
Sodium	7440-23-5	1	mg/L	**35**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**14**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Gallium	7440-55-3	0.001	mg/L	<0.001	----	----	----	----
Lanthanum	7439-91-0	0.001	mg/L	<0.001	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.00004	mg/L	<0.00004	----	----	----	----
EG049G LL-F: Dissolved Trivalent Chromium - Low Level								
Trivalent Chromium	16065-83-1	0.001	mg/L	<0.001	----	----	----	----
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level								
Hexavalent Chromium	18540-29-9	0.001	mg/L	**0.004**	----	----	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								
Aluminium	7429-90-5	5	µg/L	**136**	----	----	----	----
Antimony	7440-36-0	0.5	µg/L	**1.4**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 1 - Before Dredging**	----	----	----	----
			Client sampling date / time	01-Feb-2017 16:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702253-001**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS - Continued								
Arsenic	7440-38-2	0.5	µg/L	**1.2**	----	----	----	----
Barium	7440-39-3	1	µg/L	**10**	----	----	----	----
Beryllium	7440-41-7	0.1	µg/L	<0.1	----	----	----	----
Bismuth	7440-69-9	0.1	µg/L	<0.1	----	----	----	----
Boron	7440-42-8	100	µg/L	<100	----	----	----	----
Cadmium	7440-43-9	0.2	µg/L	<0.2	----	----	----	----
Chromium	7440-47-3	0.5	µg/L	**3.9**	----	----	----	----
Cobalt	7440-48-4	0.2	µg/L	<0.2	----	----	----	----
Copper	7440-50-8	1	µg/L	**6**	----	----	----	----
Iron	7439-89-6	5	µg/L	**8**	----	----	----	----
Lead	7439-92-1	0.2	µg/L	<0.2	----	----	----	----
Manganese	7439-96-5	0.5	µg/L	<0.5	----	----	----	----
Molybdenum	7439-98-7	0.1	µg/L	**7.0**	----	----	----	----
Nickel	7440-02-0	0.5	µg/L	**0.8**	----	----	----	----
Selenium	7782-49-2	2	µg/L	<2	----	----	----	----
Silver	7440-22-4	0.1	µg/L	<0.1	----	----	----	----
Strontium	7440-24-6	10	µg/L	**119**	----	----	----	----
Thallium	7440-28-0	0.1	µg/L	<0.1	----	----	----	----
Tin	7440-31-5	5	µg/L	<5	----	----	----	----
Uranium	7440-61-1	0.1	µg/L	**0.2**	----	----	----	----
Vanadium	7440-62-2	0.5	µg/L	**26.6**	----	----	----	----
Zinc	7440-66-6	5	µg/L	<5	----	----	----	----
EK010-1: Chlorine								
Total Residual Chlorine	----	0.02	mg/L	<0.02	----	----	----	----
EK025SF: Free CN by Segmented Flow Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	----	----	----	----
EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser								
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	----	----	----	----
EK084: Un-ionized Hydrogen Sulfide								
Unionized Hydrogen Sulfide	----	0.1	mg/L	<0.1	----	----	----	----
EK255A: Ammonia								
Ammonia as N	7664-41-7	0.005	mg/L	**0.142**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 1 - Before Dredging**	----	----	----	----
			Client sampling date / time	01-Feb-2017 16:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702253-001**	--------	--------	--------	--------
				Result	----	----	----	----
EK257A: Nitrite								
Nitrite as N	14797-65-0	0.002	mg/L	**0.167**	----	----	----	----
EK258A: Nitrate								
Nitrate as N	14797-55-8	0.002	mg/L	**0.345**	----	----	----	----
EK259A: Nitrite and Nitrate (NOx)								
Nitrite + Nitrate as N	----	0.002	mg/L	**0.512**	----	----	----	----
EK261A: Total Kjeldahl Nitrogen								
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	**0.75**	----	----	----	----
EK262A: Total Nitrogen								
Total Nitrogen as N	----	0.01	mg/L	**1.26**	----	----	----	----
EK267A: Total Phosphorus (Persulfate Digestion)								
Total Phosphorus as P	----	0.005	mg/L	**0.048**	----	----	----	----
EP020: Oil and Grease (O&G)								
Oil & Grease	----	5	mg/L	<5	----	----	----	----
EP050: Anionic Surfactants as MBAS								
Anionic Surfactants as MBAS	----	0.1	mg/L	<0.1	----	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1	µg/L	<1.0	----	----	----	----
2-Chlorophenol	95-57-8	1	µg/L	<1.0	----	----	----	----
2-Methylphenol	95-48-7	1	µg/L	<1.0	----	----	----	----
3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	----	----	----	----
2-Nitrophenol	88-75-5	1	µg/L	<1.0	----	----	----	----
2.4-Dimethylphenol	105-67-9	1	µg/L	<1.0	----	----	----	----
2.4-Dichlorophenol	120-83-2	1	µg/L	<1.0	----	----	----	----
2.6-Dichlorophenol	87-65-0	1	µg/L	<1.0	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	1	µg/L	<1.0	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	1	µg/L	<1.0	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	1	µg/L	<1.0	----	----	----	----
Pentachlorophenol	87-86-5	2	µg/L	<2.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1	µg/L	<1.0	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 1 - Before Dredging**	----	----	----	----
			Client sampling date / time	01-Feb-2017 16:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702253-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Phenanthrene	85-01-8	1	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	----	----	----	----
EP075C: Phthalate Esters								
Dimethyl phthalate	131-11-3	2	µg/L	<2	----	----	----	----
Diethyl phthalate	84-66-2	2	µg/L	<2	----	----	----	----
Di-n-butyl phthalate	84-74-2	2	µg/L	<2	----	----	----	----
Butyl benzyl phthalate	85-68-7	2	µg/L	<2	----	----	----	----
bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L	<10	----	----	----	----
Di-n-octylphthalate	117-84-0	2	µg/L	<2	----	----	----	----
EP075G: Chlorinated Hydrocarbons								
1.3-Dichlorobenzene	541-73-1	2	µg/L	<2	----	----	----	----
1.4-Dichlorobenzene	106-46-7	2	µg/L	<2	----	----	----	----
1.2-Dichlorobenzene	95-50-1	2	µg/L	<2	----	----	----	----
Hexachloroethane	67-72-1	2	µg/L	<2	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	2	µg/L	<2	----	----	----	----
Hexachloropropylene	1888-71-7	2	µg/L	<2	----	----	----	----
Hexachlorobutadiene	87-68-3	2	µg/L	<2	----	----	----	----
Hexachlorocyclopentadiene	77-47-4	10	µg/L	<10	----	----	----	----
Pentachlorobenzene	608-93-5	2	µg/L	<2	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	4	µg/L	<4	----	----	----	----
EP075H: Anilines and Benzidines								
Aniline	62-53-3	2	µg/L	<2	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**Dam 1 - Before Dredging**	----	----	----	----
			Client sampling date / time	01-Feb-2017 16:00	----	----	----	----
Compound	CAS Number	LOR	Unit	**ES1702253-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP075H: Anilines and Benzidines - Continued								
4-Chloroaniline	106-47-8	2	µg/L	<2	----	----	----	----
2-Nitroaniline	88-74-4	4	µg/L	<4	----	----	----	----
3-Nitroaniline	99-09-2	4	µg/L	<4	----	----	----	----
Dibenzofuran	132-64-9	2	µg/L	<2	----	----	----	----
4-Nitroaniline	100-01-6	2	µg/L	<2	----	----	----	----
Carbazole	86-74-8	2	µg/L	<2	----	----	----	----
3.3`-Dichlorobenzidine	91-94-1	2	µg/L	<2	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ **Total Xylenes**	1330-20-7	2	µg/L	<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP094A: Synthetic Pyrethroids								
Bioresmethrin	28434-01-07	0.5	µg/L	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 1 - Before Dredging**	----	----	----	----
			Client sampling date / time	01-Feb-2017 16:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702253-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP094A: Synthetic Pyrethroids - Continued								
Bifenthrin	82657-04-3	0.5	µg/L	<0.5	----	----	----	----
Phenothrin	26002-80-2	0.5	µg/L	<0.5	----	----	----	----
Lambda-cyhalothrin	68085-85-8	0.5	µg/L	<0.5	----	----	----	----
Permethrin	52645-53-1	0.5	µg/L	<0.5	----	----	----	----
Cyfluthrin	68359-37-5	0.5	µg/L	<0.5	----	----	----	----
Cypermethrin	52315-07-8	0.5	µg/L	<0.5	----	----	----	----
Fenvalverate & Esfenvalerate	51630-58-1/66230-04-	0.5	µg/L	<0.5	----	----	----	----
Deltamethrin & Tralomethrin	62229-77-0/66841-25-	0.5	µg/L	<0.5	----	----	----	----
Allethrin	584-79-2	0.5	µg/L	<0.5	----	----	----	----
Transfluthrin	118712-89-3	0.5	µg/L	<0.5	----	----	----	----
Tau-fluvalinate	102851-06-9	0.5	µg/L	<0.5	----	----	----	----
Tetramethrin	68085-85-8	0.5	µg/L	<0.5	----	----	----	----
EP094B: Synergist								
Piperonyl Butoxide	63993-73-7	0.5	µg/L	<0.5	----	----	----	----
EP117: Alcohols								
Ethanol	64-17-5	50	µg/L	<50	----	----	----	----
Isopropanol	67-63-0	50	µg/L	<50	----	----	----	----
n-Propanol	71-23-8	50	µg/L	<50	----	----	----	----
Isobutanol	78-83-1	50	µg/L	<50	----	----	----	----
n-Butanol	71-36-3	50	µg/L	<50	----	----	----	----
EP125A: Monocyclic Aromatic Hydrocarbons								
Benzene	71-43-2	0.05	µg/L	<0.05	----	----	----	----
Toluene	108-88-3	0.5	µg/L	**1.0**	----	----	----	----
Ethylbenzene	100-41-4	0.05	µg/L	<0.05	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.05	µg/L	**0.06**	----	----	----	----
Styrene	100-42-5	0.05	µg/L	**0.36**	----	----	----	----
ortho-Xylene	95-47-6	0.05	µg/L	<0.05	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	0.05	µg/L	<0.05	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	0.05	µg/L	<0.05	----	----	----	----
EP125D: Fumigants								
1.2-Dichloropropane	78-87-5	0.1	µg/L	<0.1	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.1	µg/L	<0.1	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 1 - Before Dredging**	----	----	----	----
			Client sampling date / time	01-Feb-2017 16:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702253-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP125D: Fumigants - Continued								
trans-1.3-Dichloropropylene	10061-02-6	0.1	µg/L	<0.1	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.1	µg/L	<0.1	----	----	----	----
EP125E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	0.5	µg/L	<0.5	----	----	----	----
Vinyl chloride	75-01-4	0.3	µg/L	<0.3	----	----	----	----
Bromomethane	74-83-9	0.5	µg/L	<0.5	----	----	----	----
Chloroethane	75-00-3	0.5	µg/L	<0.5	----	----	----	----
Trichlorofluoromethane	75-69-4	0.5	µg/L	<0.5	----	----	----	----
1.1-Dichloroethene	75-35-4	0.1	µg/L	<0.1	----	----	----	----
Dichloromethane	75-09-2	1	µg/L	<1.0	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	0.1	µg/L	<0.1	----	----	----	----
1.1-Dichloroethane	75-34-3	0.1	µg/L	<0.1	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	0.1	µg/L	<0.1	----	----	----	----
Bromochloromethane	74-97-5	0.5	µg/L	<0.5	----	----	----	----
1.2-Dichloroethane	107-06-2	0.1	µg/L	<0.1	----	----	----	----
1.1.1-Trichloroethane	71-55-6	0.1	µg/L	<0.1	----	----	----	----
Carbon Tetrachloride	56-23-5	0.05	µg/L	<0.05	----	----	----	----
Trichloroethene	79-01-6	0.05	µg/L	<0.05	----	----	----	----
Tetrachloroethene	127-18-4	0.05	µg/L	<0.05	----	----	----	----
Hexachlorobutadiene	87-68-3	0.04	µg/L	<0.04	----	----	----	----
EP125F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	0.1	µg/L	**0.30**	----	----	----	----
Bromobenzene	108-86-1	0.1	µg/L	<0.10	----	----	----	----
Benzylchloride	100-44-7	0.2	µg/L	<0.2	----	----	----	----
1.3-Dichlorobenzene	541-73-1	0.1	µg/L	<0.10	----	----	----	----
1.4-Dichlorobenzene	106-46-7	0.1	µg/L	<0.10	----	----	----	----
1.2-Dichlorobenzene	95-50-1	0.1	µg/L	<0.10	----	----	----	----
2-Chlorotoluene	95-49-8	0.1	µg/L	<0.1	----	----	----	----
4-Chlorotoluene	106-43-4	0.1	µg/L	<0.1	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.1	µg/L	<0.1	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.1	µg/L	<0.1	----	----	----	----
^ **Trichlorobenzenes (Sum)**	----	0.1	µg/L	<0.1	----	----	----	----
EP125G: Trihalomethanes								
Chloroform	67-66-3	0.1	µg/L	**1.53**	----	----	----	----

Analytical Results

Sub-Matrix: WATER **(Matrix: WATER)**			*Client sample ID*	**Dam 1 - Before Dredging**	----	----	----	----
			Client sampling date / time	01-Feb-2017 16:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702253-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP125G: Trihalomethanes - Continued								
Bromodichloromethane	75-27-4	0.1	µg/L	**0.39**	----	----	----	----
Dibromochloromethane	124-48-1	0.1	µg/L	**0.14**	----	----	----	----
Bromoform	75-25-2	0.1	µg/L	<0.10	----	----	----	----
^ **Total Trihalomethanes**	----	0.1	µg/L	**2.06**	----	----	----	----
EP125H: Naphthalene								
Naphthalene	91-20-3	0.05	µg/L	<0.05	----	----	----	----
EP125L: Methyl t-butyl ether								
Methyl tert-butyl ether (MTBE)	1634-04-4	0.1	µg/L	<0.1	----	----	----	----
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.01	µg/L	<0.010	----	----	----	----
alpha-BHC	319-84-6	0.01	µg/L	<0.010	----	----	----	----
beta-BHC	319-85-7	0.01	µg/L	<0.010	----	----	----	----
delta-BHC	319-86-8	0.01	µg/L	<0.010	----	----	----	----
4.4`-DDD	72-54-8	0.01	µg/L	<0.010	----	----	----	----
4.4`-DDE	72-55-9	0.01	µg/L	<0.010	----	----	----	----
4.4`-DDT	50-29-3	0.01	µg/L	<0.010	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.01	µg/L	<0.010	----	----	----	----
Dieldrin	60-57-1	0.01	µg/L	<0.010	----	----	----	----
alpha-Endosulfan	959-98-8	0.01	µg/L	<0.010	----	----	----	----
beta-Endosulfan	33213-65-9	0.01	µg/L	<0.010	----	----	----	----
Endosulfan sulfate	1031-07-8	0.01	µg/L	<0.010	----	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.01	µg/L	<0.010	----	----	----	----
Endrin	72-20-8	0.01	µg/L	<0.010	----	----	----	----
Endrin aldehyde	7421-93-4	0.01	µg/L	<0.010	----	----	----	----
Endrin ketone	53494-70-5	0.01	µg/L	<0.010	----	----	----	----
Heptachlor	76-44-8	0.005	µg/L	<0.005	----	----	----	----
Heptachlor epoxide	1024-57-3	0.01	µg/L	<0.010	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.01	µg/L	<0.010	----	----	----	----
gamma-BHC	58-89-9	0.01	µg/L	<0.010	----	----	----	----
Methoxychlor	72-43-5	0.01	µg/L	<0.010	----	----	----	----
cis-Chlordane	5103-71-9	0.01	µg/L	<0.010	----	----	----	----
trans-Chlordane	5103-74-2	0.01	µg/L	<0.010	----	----	----	----
^ **Total Chlordane (sum)**	----	0.01	µg/L	<0.010	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 1 - Before Dredging**	----	----	----	----
			Client sampling date / time	01-Feb-2017 16:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702253-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP131A: Organochlorine Pesticides - Continued								
Oxychlordane	27304-13-8	0.01	µg/L	<0.010	----	----	----	----
EP131B: Polychlorinated Biphenyls (as Aroclors)								
Total Polychlorinated biphenyls	----	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1016	12674-11-2	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1221	11104-28-2	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1232	11141-16-5	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1242	53469-21-9	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1248	12672-29-6	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1254	11097-69-1	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1260	11096-82-5	0.1	µg/L	<0.10	----	----	----	----
EP132C: Chlorinated Naphthalenes								
1-Chloronaphthalene	90-13-1	0.1	µg/L	<0.1	----	----	----	----
2-Chloronaphthalene	91-58-7	0.1	µg/L	<0.1	----	----	----	----
^ **Chloronaphthalenes (1- + 2-)**	----	0.1	µg/L	<0.1	----	----	----	----
EP203A: Explosives								
HMX	2691-41-0	1	µg/L	<1.0	----	----	----	----
RDX	----	1	µg/L	<1.0	----	----	----	----
1.3.5-Trinitrobenzene	99-35-4	1	µg/L	<1.0	----	----	----	----
1.3-Dinitrobenzene	99-65-0	1	µg/L	<1.0	----	----	----	----
Tetryl	479-45-8	1	µg/L	<1.0	----	----	----	----
2.4.6-TNT	118-96-7	1	µg/L	<1.0	----	----	----	----
4-Amino.2.6-DNT	19406-51-0	1	µg/L	<1.0	----	----	----	----
2-Amino-4.6-DNT	35572-78-2	1	µg/L	<1.0	----	----	----	----
4-& 2-AM-DNT(Isomeric Mixture)	----	1	µg/L	<1.0	----	----	----	----
2.4-Dinitrotoluene	121-14-2	1	µg/L	<1.0	----	----	----	----
2.6-Dinitrotoluene	606-20-2	1	µg/L	<1.0	----	----	----	----
2.4-& 2.6-DNT(Isomeric Mixture)	51-28-5/606-20-2	1	µg/L	<1.0	----	----	----	----
Nitrobenzene	98-95-3	1	µg/L	<1.0	----	----	----	----
2-Nitrotoluene	88-72-2	1	µg/L	<1.0	----	----	----	----
3-Nitrotoluene	99-08-1	1	µg/L	<1.0	----	----	----	----
4-Nitrotoluene	99-99-0	1	µg/L	<1.0	----	----	----	----
Nitroglycerine	55-63-0	5	µg/L	<5	----	----	----	----
PETN	78-11-5	5	µg/L	<5	----	----	----	----
EP234: Multiresidue Pesticides (ESI Positive)								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 1 - Before Dredging**	----	----	----	----
			Client sampling date / time	01-Feb-2017 16:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702253-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
3-Hydroxy Carbofuran	16655-82-6	0.02	µg/L	<0.02	----	----	----	----
Abamectin	71751-41-2	0.1	µg/L	<0.1	----	----	----	----
Acephate	30560-19-1	0.5	µg/L	<0.5	----	----	----	----
Alachlor	15972-60-8	0.1	µg/L	<0.1	----	----	----	----
Aldicarb	116-06-3	0.05	µg/L	<0.05	----	----	----	----
Ametryn	834-12-8	0.01	µg/L	<0.01	----	----	----	----
Aminopyralid	150114-71-9	0.1	µg/L	<0.1	----	----	----	----
Amitraz	33089-61-1	100	µg/L	<100	----	----	----	----
Atrazine	1912-24-9	0.01	µg/L	<0.01	----	----	----	----
Atrazine-desethyl	6190-65-4	0.1	µg/L	<0.1	----	----	----	----
Atrazine-desisopropyl	1007-28-9	0.1	µg/L	<0.1	----	----	----	----
Azinphos-ethyl	2642-71-9	0.02	µg/L	<0.02	----	----	----	----
Azinphos-methyl	86-50-0	0.02	µg/L	<0.02	----	----	----	----
Azoxystrobin	131860-33-8	0.1	µg/L	<0.1	----	----	----	----
Bendiocarb	22781-23-3	0.1	µg/L	<0.10	----	----	----	----
Benomyl	17804-35-2	0.01	µg/L	**0.25**	----	----	----	----
Bensulfuron methyl	83055-99-6	0.1	µg/L	<0.1	----	----	----	----
Bensulide	741-58-2	0.1	µg/L	<0.1	----	----	----	----
Boscalid	188425-85-6	0.1	µg/L	<0.1	----	----	----	----
Bromacil	314-40-9	0.02	µg/L	<0.02	----	----	----	----
Bromophos-ethyl	4824-78-6	0.1	µg/L	<0.10	----	----	----	----
Butachlor	23184-66-9	0.1	µg/L	<0.1	----	----	----	----
Carbaryl	63-25-2	0.01	µg/L	<0.01	----	----	----	----
Carbendazim (Thiophanate methyl)	10605-21-7	0.1	µg/L	**0.2**	----	----	----	----
Carbofenothion	786-19-6	0.02	µg/L	<0.02	----	----	----	----
Carbofuran	1563-66-2	0.01	µg/L	<0.01	----	----	----	----
Carboxin	5234-68-4	0.1	µg/L	<0.1	----	----	----	----
Carfentrazone-ethyl	128639-02-1	0.1	µg/L	<0.1	----	----	----	----
Chlorantraniliprole	500008-45-7	0.1	µg/L	<0.1	----	----	----	----
Chlorfenvinphos	470-90-6	0.02	µg/L	<0.02	----	----	----	----
Chloroxuron	1982-47-4	0.1	µg/L	<0.1	----	----	----	----
Chlorpyrifos	2921-88-2	0.02	µg/L	<0.02	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.1	µg/L	<0.2	----	----	----	----
Chlorsulfuron	64902-72-3	0.2	µg/L	<0.2	----	----	----	----

Analytical Results

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

			Client sample ID	**Dam 1 - Before Dredging**	----	----	----	----
			Client sampling date / time	01-Feb-2017 16:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702253-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Coumaphos	56-72-4	0.01	µg/L	<0.01	----	----	----	----
Cyanazine	21725-46-2	0.02	µg/L	<0.02	----	----	----	----
Cyproconazole	94361-06-5	0.02	µg/L	<0.02	----	----	----	----
Cyprodinil	121552-61-2	0.01	µg/L	<0.01	----	----	----	----
Cyromazine	66215-27-8	0.05	µg/L	<0.05	----	----	----	----
Demeton-O	298-03-0	0.02	µg/L	<0.02	----	----	----	----
Demeton-O & Demeton-S	298-03-3/126-75-0	0.02	µg/L	<0.02	----	----	----	----
Demeton-S	126-75-0	0.02	µg/L	<0.02	----	----	----	----
Demeton-S-methyl	919-86-8	0.02	µg/L	<0.02	----	----	----	----
Diazinon	333-41-5	0.01	µg/L	**0.17**	----	----	----	----
Dichlobenil	1194-65-6	0.1	µg/L	<0.1	----	----	----	----
Dichlorvos	62-73-7	0.2	µg/L	<0.20	----	----	----	----
Diclofop-methyl	51338-27-3	0.05	µg/L	<0.05	----	----	----	----
Difenoconazole	119446-68-3	0.02	µg/L	<0.02	----	----	----	----
Diflubenzuron	35367-38-5	0.1	µg/L	<0.1	----	----	----	----
Dimethoate	60-51-5	0.02	µg/L	<0.02	----	----	----	----
Diphenamid	957-51-7	0.1	µg/L	<0.1	----	----	----	----
Disulfoton	298-04-4	0.05	µg/L	<0.05	----	----	----	----
Diuron	330-54-1	0.02	µg/L	<0.02	----	----	----	----
EPN	2104-64-5	0.05	µg/L	<0.05	----	----	----	----
EPTC	759-94-4	0.1	µg/L	<0.1	----	----	----	----
Ethion	563-12-2	0.02	µg/L	<0.02	----	----	----	----
Ethoprophos	13194-48-4	0.01	µg/L	<0.01	----	----	----	----
Etridiazole	2593-15-9	0.5	µg/L	<0.5	----	----	----	----
Fenamiphos	22224-92-6	0.01	µg/L	<0.01	----	----	----	----
Fenarimol	60168-88-9	0.02	µg/L	<0.02	----	----	----	----
Fenchlorphos (Ronnel)	299-84-3	10	µg/L	<10	----	----	----	----
Fenitrothion	122-14-5	2	µg/L	<2	----	----	----	----
Fenoxycarb	79127-80-3	0.1	µg/L	<0.1	----	----	----	----
Fensulfothion	115-90-2	0.01	µg/L	<0.01	----	----	----	----
Fenthion	55-38-9	0.05	µg/L	<0.05	----	----	----	----
Flamprop methyl	52756-25-9	0.1	µg/L	<0.1	----	----	----	----
Fluometuron	2164-17-2	0.01	µg/L	<0.01	----	----	----	----
Flusilazole	85509-19-9	0.02	µg/L	<0.02	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 1 - Before Dredging**	----	----	----	----
			Client sampling date / time	01-Feb-2017 16:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702253-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Formothion	2540-82-1	20	µg/L	<20	----	----	----	----
Fosetyl Aluminium	39148-24-8	10	µg/L	<10	----	----	----	----
Haloxyfop	69806-34-4	0.1	µg/L	<0.1	----	----	----	----
Hexaconazole	79983-71-4	0.02	µg/L	<0.02	----	----	----	----
Hexazinone	51235-04-2	0.02	µg/L	<0.02	----	----	----	----
Imazapyr	94795-74-1	10	µg/L	<10.0	----	----	----	----
Indoxacarb	173584-44-6	0.1	µg/L	<0.1	----	----	----	----
Iodosulfuron methyl	144550-36-7	0.1	µg/L	<0.1	----	----	----	----
Irgarol	28159-98-0	0.002	µg/L	<0.002	----	----	----	----
Isoproturon	34123-59-6	0.1	µg/L	<0.1	----	----	----	----
Malathion	121-75-5	0.02	µg/L	<0.02	----	----	----	----
Metalaxyl	57837-19-1	0.1	µg/L	<0.1	----	----	----	----
Metalaxyl-M	70630-17-0	0.1	µg/L	<0.1	----	----	----	----
Metaldehyde	108-62-3	10	µg/L	<10	----	----	----	----
Methidathion	950-37-8	0.1	µg/L	<0.1	----	----	----	----
Methiocarb	2032-65-7	0.01	µg/L	<0.01	----	----	----	----
Methomyl	16752-77-5	0.01	µg/L	<0.01	----	----	----	----
Metolachlor	51218-45-2	0.01	µg/L	<0.01	----	----	----	----
Metribuzin	21087-64-9	0.02	µg/L	<0.02	----	----	----	----
Mevinphos	7786-34-7	0.02	µg/L	<0.02	----	----	----	----
Molinate	2212-67-1	0.1	µg/L	<0.1	----	----	----	----
Monocrotophos	6923-22-4	0.02	µg/L	<0.02	----	----	----	----
Myclobutanil	88671-89-0	0.1	µg/L	<0.1	----	----	----	----
Naftalofos	1491-41-4	1	µg/L	<1.0	----	----	----	----
Napropamide	15299-99-7	0.1	µg/L	<0.1	----	----	----	----
Nitralin	4726-14-1	0.1	µg/L	<0.1	----	----	----	----
Norflurazon	27314-13-2	0.1	µg/L	<0.1	----	----	----	----
Novaluron	116714-46-6	0.1	µg/L	<0.1	----	----	----	----
Omethoate	1113-02-6	0.01	µg/L	<0.01	----	----	----	----
Oxamyl	23135-22-0	0.01	µg/L	<0.01	----	----	----	----
Oxyfluorfen	42874-03-3	1	µg/L	<1.0	----	----	----	----
Paclobutrazole	76738-62-0	0.05	µg/L	<0.05	----	----	----	----
Parathion	56-38-2	0.2	µg/L	<0.2	----	----	----	----
Parathion-methyl	298-00-0	0.5	µg/L	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 1 - Before Dredging**	**----**	**----**	**----**	**----**
			Client sampling date / time	01-Feb-2017 16:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702253-001**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Pebulate	1114-71-2	0.1	µg/L	<0.1	----	----	----	----
Penconazole	66246-88-6	0.01	µg/L	<0.01	----	----	----	----
Pendimethalin	40487-42-1	0.05	µg/L	<0.05	----	----	----	----
Phorate	298-02-2	0.1	µg/L	<0.1	----	----	----	----
Pirimicarb	23103-98-2	0.1	µg/L	<0.1	----	----	----	----
Pirimiphos-ethyl	23505-41-1	0.01	µg/L	<0.01	----	----	----	----
Pirimiphos-methyl	29232-93-7	0.01	µg/L	<0.01	----	----	----	----
Prochloraz	67747-09-5	0.1	µg/L	<0.1	----	----	----	----
Profenofos	41198-08-7	0.01	µg/L	<0.01	----	----	----	----
Promecarb	2631-37-0	0.1	µg/L	<0.1	----	----	----	----
Prometryn	7287-19-6	0.01	µg/L	<0.01	----	----	----	----
Propachlor	1918-16-7	0.1	µg/L	<0.1	----	----	----	----
Propamocarb	24579-73-5	0.1	µg/L	<0.1	----	----	----	----
Propargite	2312-35-8	0.1	µg/L	<0.1	----	----	----	----
Propazine	139-40-2	0.01	µg/L	<0.01	----	----	----	----
Propiconazole	60207-90-1	0.05	µg/L	<0.05	----	----	----	----
Propyzamide	23950-58-5	0.1	µg/L	<0.1	----	----	----	----
Prothiofos	34643-46-4	0.1	µg/L	<0.1	----	----	----	----
Pyraclostrobin	175013-18-0	0.1	µg/L	<0.1	----	----	----	----
Pyrazophos	13457-18-6	0.1	µg/L	<0.1	----	----	----	----
Pyrimethanil	53112-28-0	0.02	µg/L	<0.02	----	----	----	----
Pyriproxyfen	95737-68-1	0.1	µg/L	<0.1	----	----	----	----
Pyroxsulam	422556-08-9	0.1	µg/L	<0.1	----	----	----	----
Quinclorac	84087-01-4	0.1	µg/L	<0.1	----	----	----	----
Rimsulfuron	122931-48-0	0.1	µg/L	<0.1	----	----	----	----
Siduron	1982-49-6	0.1	µg/L	<0.1	----	----	----	----
Simazine	122-34-9	0.02	µg/L	**0.03**	----	----	----	----
Spirotetramat	203313-25-1	0.1	µg/L	<0.1	----	----	----	----
Sulfotep	3689-24-5	0.005	µg/L	<0.005	----	----	----	----
Sulprofos	35400-43-2	0.05	µg/L	<0.05	----	----	----	----
Tebuconazole	107534-96-3	0.01	µg/L	<0.01	----	----	----	----
Tebuthiuron	34014-18-1	0.02	µg/L	<0.02	----	----	----	----
Temephos	3383-96-8	0.02	µg/L	<0.02	----	----	----	----
Terbacil	5902-51-2	0.1	µg/L	<0.1	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**Dam 1 - Before Dredging**	----	----	----	----
			Client sampling date / time	01-Feb-2017 16:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702253-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Terbufos	13071-79-9	0.01	µg/L	<0.01	----	----	----	----
Terbuthylazine	5915-41-3	0.01	µg/L	<0.01	----	----	----	----
Terbutryn	886-50-0	0.01	µg/L	<0.01	----	----	----	----
Tetrachlorvinphos	22248-79-9	0.01	µg/L	<0.01	----	----	----	----
Tetraconazole	112281-77-3	0.1	µg/L	<0.1	----	----	----	----
Thiamethoxam	153719-23-4	0.02	µg/L	<0.02	----	----	----	----
Thiobencarb	28249-77-6	0.01	µg/L	<0.01	----	----	----	----
Thiodicarb	59669-26-0	0.01	µg/L	<0.01	----	----	----	----
Thiometon	640-15-3	0.5	µg/L	<0.5	----	----	----	----
Toltrazuril	69004-03-1	0.5	µg/L	<0.5	----	----	----	----
Triadimefon	43121-43-3	0.1	µg/L	<0.1	----	----	----	----
Triadimenol	55219-65-3	0.1	µg/L	<0.1	----	----	----	----
Triazophos	24017-47-8	0.005	µg/L	<0.005	----	----	----	----
Trichlorfon	52-68-6	0.02	µg/L	<0.02	----	----	----	----
Trichloronate	327-98-0	0.5	µg/L	<0.5	----	----	----	----
Trifloxystrobin	141517-21-7	0.1	µg/L	<0.1	----	----	----	----
Trifloxysulfuron-sodium	199119-58-9	0.1	µg/L	<0.1	----	----	----	----
Trifluralin	1582-09-8	10	µg/L	<10.0	----	----	----	----
Trinexapac Ethyl	95266-40-3	1	µg/L	<1	----	----	----	----
Vernolate	1929-77-7	0.1	µg/L	<0.1	----	----	----	----
EP247: Phenolics and Related Compounds								
2,4-Dinitrophenol	51-28-5	0.01	µg/L	**0.02**	----	----	----	----
2-Methyl-4.6-dinitrophenol	8071-51-0	0.05	µg/L	<0.05	----	----	----	----
4-Nonylphenol (mixture of isomers)	84852-15-3	0.1	µg/L	<0.10	----	----	----	----
Hexachlorophene	70-30-4	0.1	µg/L	<0.10	----	----	----	----
4-Nitrophenol	100-02-7	0.1	µg/L	**0.14**	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.1	µg/L	<0.10	----	----	----	----
Pentachlorophenol	87-86-5	0.1	µg/L	<0.10	----	----	----	----
Dinoseb	88-85-7	0.1	µg/L	<0.10	----	----	----	----
Dalapon	75-99-0	0.1	µg/L	<0.10	----	----	----	----
Bisphenol-A	80-05-7	0.05	µg/L	**0.79**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	**24.6**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Dam 1 - Before Dredging**	----	----	----	----
			Client sampling date / time	01-Feb-2017 16:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702253-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates - Continued								
2-Chlorophenol-D4	93951-73-6	1	%	**45.7**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%	**58.9**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	**58.8**	----	----	----	----
Anthracene-d10	1719-06-8	1	%	**90.5**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1	%	**77.4**	----	----	----	----
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	2	%	**28.5**	----	----	----	----
Phenol-d6	13127-88-3	2	%	**30.8**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	2	%	**47.4**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	2	%	**52.8**	----	----	----	----
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	2	%	**60.0**	----	----	----	----
1.2-Dichlorobenzene-D4	2199-69-1	2	%	**41.6**	----	----	----	----
2-Fluorobiphenyl	321-60-8	2	%	**62.7**	----	----	----	----
Anthracene-d10	1719-06-8	2	%	**91.5**	----	----	----	----
4-Terphenyl-d14	1718-51-0	2	%	**94.1**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**115**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**104**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**97.3**	----	----	----	----
EP094S: Pesticide Surrogate								
DEF	78-48-8	0.5	%	**86.7**	----	----	----	----
EP125S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**94.8**	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	**98.8**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**96.2**	----	----	----	----
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.01	%	**95.6**	----	----	----	----
EP131T: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	**64.0**	----	----	----	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**73.0**	----	----	----	----

Analytical Results

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

			Client sample ID	**Dam 1 - Before Dredging**	**----**	**----**	**----**	**----**
			Client sampling date / time	01-Feb-2017 16:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702253-001**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EP132T: Base/Neutral Extractable Surrogates - Continued								
Anthracene-d10	1719-06-8	0.1	%	**86.9**	**----**	**----**	**----**	**----**
4-Terphenyl-d14	1718-51-0	0.1	%	**89.0**	**----**	**----**	**----**	**----**
EP203S: Explosives Surrogate								
o-Dinitrobenzene	528-29-0	1	%	**61.7**	**----**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	*CAS Number*	*Recovery Limits (%)*	
		Low	***High***
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	10	117
Phenol-d6	13127-88-3	10	69
2-Chlorophenol-D4	93951-73-6	21	130
2.4.6-Tribromophenol	118-79-6	10	151
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	29	142
1.2-Dichlorobenzene-D4	2199-69-1	24	121
2-Fluorobiphenyl	321-60-8	27	135
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	21	123
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128
EP094S: Pesticide Surrogate			
DEF	78-48-8	42	143
EP125S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	65	127
4-Bromofluorobenzene	460-00-4	68	124
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	14	166
EP131T: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	10	144
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	135
Anthracene-d10	1719-06-8	48	138
4-Terphenyl-d14	1718-51-0	48	144
EP203S: Explosives Surrogate			

Sub-Matrix: **WATER**

Compound	*CAS Number*	***Recovery Limits (%)***	
		Low	***High***
EP203S: Explosives Surrogate - Continued			
o-Dinitrobenzene	528-29-0	51	125

CERTIFICATE OF ANALYSIS

Work Order	: **ES1702939**	Page	: 1 of 20
Client	: **BORAL RECYCLING - WIDEMERE**	Laboratory	: Environmental Division Sydney
Contact	: PHILIP PATERSON	Contact	: Customer Services ES
Address	: Boral Recycling Wetherill Park, NSW 2164	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: 02 9604 9101	Telephone	: +61-2-8784 8555
Project	: SURFACE WATER ANALYSIS	Date Samples Received	: 08-Feb-2017 18:47
Order number	:	Date Analysis Commenced	: 08-Feb-2017
C-O-C number	: ----	Issue Date	: 24-Feb-2017 15:54
Sampler	: ----		
Site	: ----		
Quote number	: SY/662/16 V4		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Dian Dao		Sydney Inorganics, Smithfield, NSW
Diana Mesa	2IC Organic Chemist	Brisbane Organics, Stafford, QLD
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- EP247 : Poor matrix spike recovery due to matrix interferences(confirmed by re-analysis).
- EG093: Sample ES1702939-001 was run on EG094 method due to low TDS content.
- EP075: Poor matrix spike and surrogate recovery due to sample heterogeneity. Confirmed by re-extraction and re-analysis.
- EP075(SIM): Particular sample surrogate not determined and Poor Matrix Spike recovery due to samples matrix interferences.Confirmed by re-analysis.
- EP050: The MBAS reported is calculated as LAS, mol wt _342______.
- Total PAH reported as the sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene and Benzo(g,h,i)perylene.
- EP075: 'Sum of PAH' is the sum of the USEPA 16 priority PAHs
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**DAM 1 - DURING DREDGING (FILTERED)**	**DAM 1 - DURING DREDGING (TOTAL)**	----	----	----
			Client sampling date / time	08-Feb-2017 00:00	08-Feb-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702939-001**	**ES1702939-002**	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**10.2**	**10.0**	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**486**	**365**	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**212**	**148**	----	----	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	**231**	**187**	----	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	**52**	----	----	----	----
EA075: Redox Potential								
Redox Potential	----	0.1	mV	**88.0**	----	----	----	----
pH Redox	----	0.01	pH Unit	**10.8**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**60**	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**27**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**21**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	<1	----	----	----	----
Sodium	7440-23-5	1	mg/L	**34**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**17**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Gallium	7440-55-3	0.001	mg/L	**0.003**	----	----	----	----
Lanthanum	7439-91-0	0.001	mg/L	<0.001	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.00004	mg/L	<0.00004	----	----	----	----
EG049G LL-F: Dissolved Trivalent Chromium - Low Level								
Trivalent Chromium	16065-83-1	0.001	mg/L	**0.006**	----	----	----	----
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level								
Hexavalent Chromium	18540-29-9	0.001	mg/L	**0.003**	----	----	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								
Aluminium	7429-90-5	5	µg/L	**459**	----	----	----	----
Antimony	7440-36-0	0.5	µg/L	**3.1**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**DAM 1 - DURING DREDGING (FILTERED)**	**DAM 1 - DURING DREDGING (TOTAL)**	----	----	----
			Client sampling date / time	08-Feb-2017 00:00	08-Feb-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702939-001**	**ES1702939-002**	--------	--------	--------
				Result	Result	----	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS - Continued								
Arsenic	7440-38-2	0.5	µg/L	**1.6**	----	----	----	----
Barium	7440-39-3	1	µg/L	**51**	----	----	----	----
Beryllium	7440-41-7	0.1	µg/L	<0.1	----	----	----	----
Bismuth	7440-69-9	0.1	µg/L	<0.1	----	----	----	----
Boron	7440-42-8	100	µg/L	<100	----	----	----	----
Cadmium	7440-43-9	0.2	µg/L	<0.2	----	----	----	----
Chromium	7440-47-3	0.5	µg/L	**9.0**	----	----	----	----
Cobalt	7440-48-4	0.2	µg/L	**0.5**	----	----	----	----
Copper	7440-50-8	1	µg/L	**5**	----	----	----	----
Iron	7439-89-6	5	µg/L	**14**	----	----	----	----
Lead	7439-92-1	0.2	µg/L	<0.2	----	----	----	----
Manganese	7439-96-5	0.5	µg/L	<0.5	----	----	----	----
Molybdenum	7439-98-7	0.1	µg/L	**10.9**	----	----	----	----
Nickel	7440-02-0	0.5	µg/L	**1.6**	----	----	----	----
Selenium	7782-49-2	2	µg/L	<2	----	----	----	----
Silver	7440-22-4	0.1	µg/L	<0.1	----	----	----	----
Strontium	7440-24-6	10	µg/L	**104**	----	----	----	----
Thallium	7440-28-0	0.1	µg/L	<0.1	----	----	----	----
Tin	7440-31-5	5	µg/L	<5	----	----	----	----
Uranium	7440-61-1	0.1	µg/L	<0.1	----	----	----	----
Vanadium	7440-62-2	0.5	µg/L	**56.0**	----	----	----	----
Zinc	7440-66-6	5	µg/L	<5	----	----	----	----
EK010-1: Chlorine								
Total Residual Chlorine	----	0.02	mg/L	**0.02**	----	----	----	----
EK025SF: Free CN by Segmented Flow Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	----	----	----	----
EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser								
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	----	----	----	----
EK084: Un-ionized Hydrogen Sulfide								
Unionized Hydrogen Sulfide	----	0.1	mg/L	<0.1	----	----	----	----
EK255A: Ammonia								
Ammonia as N	7664-41-7	0.005	mg/L	**0.394**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 1 - DURING DREDGING (FILTERED)**	**DAM 1 - DURING DREDGING (TOTAL)**	----	----	----
			Client sampling date / time	08-Feb-2017 00:00	08-Feb-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702939-001**	**ES1702939-002**	--------	--------	--------
				Result	Result	----	----	----
EK257A: Nitrite								
Nitrite as N	14797-65-0	0.002	mg/L	**0.371**	----	----	----	----
EK258A: Nitrate								
Nitrate as N	14797-55-8	0.002	mg/L	**0.592**	----	----	----	----
EK259A: Nitrite and Nitrate (NOx)								
Nitrite + Nitrate as N	----	0.002	mg/L	**0.963**	----	----	----	----
EK261A: Total Kjeldahl Nitrogen								
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	**1.46**	----	----	----	----
EK262A: Total Nitrogen								
Total Nitrogen as N	----	0.01	mg/L	**2.42**	----	----	----	----
EK267A: Total Phosphorus (Persulfate Digestion)								
Total Phosphorus as P	----	0.005	mg/L	**0.176**	----	----	----	----
EP020: Oil and Grease (O&G)								
Oil & Grease	----	5	mg/L	<5	----	----	----	----
Oil & Grease	----	5	mg/L	----	<5	----	----	----
EP026SPF: Chemical Oxygen Demand (Spectrophotometric); Filtered								
Chemical Oxygen Demand - Filtered	----	10	mg/L	**21**	----	----	----	----
EP030F: Biochemical Oxygen Demand (Filtered)								
Biochemical Oxygen Demand (Filtered)	----	2	mg/L	<2	----	----	----	----
EP050: Anionic Surfactants as MBAS								
Anionic Surfactants as MBAS	----	0.1	mg/L	**0.3**	----	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1	µg/L	<1.0	----	----	----	----
2-Chlorophenol	95-57-8	1	µg/L	<1.0	----	----	----	----
2-Methylphenol	95-48-7	1	µg/L	<1.0	----	----	----	----
3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	----	----	----	----
2-Nitrophenol	88-75-5	1	µg/L	<1.0	----	----	----	----
2.4-Dimethylphenol	105-67-9	1	µg/L	<1.0	----	----	----	----
2.4-Dichlorophenol	120-83-2	1	µg/L	<1.0	----	----	----	----
2.6-Dichlorophenol	87-65-0	1	µg/L	<1.0	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	1	µg/L	<1.0	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	1	µg/L	<1.0	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	1	µg/L	<1.0	----	----	----	----
Pentachlorophenol	87-86-5	2	µg/L	<2.0	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**DAM 1 - DURING DREDGING (FILTERED)**	**DAM 1 - DURING DREDGING (TOTAL)**	----	----	----
			Client sampling date / time	08-Feb-2017 00:00	08-Feb-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702939-001**	**ES1702939-002**	--------	--------	--------
				Result	Result	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	----	----	----	----
EP075C: Phthalate Esters								
Dimethyl phthalate	131-11-3	2	µg/L	<2	----	----	----	----
Diethyl phthalate	84-66-2	2	µg/L	<2	----	----	----	----
Di-n-butyl phthalate	84-74-2	2	µg/L	<2	----	----	----	----
Butyl benzyl phthalate	85-68-7	2	µg/L	<2	----	----	----	----
bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L	<10	----	----	----	----
Di-n-octylphthalate	117-84-0	2	µg/L	<2	----	----	----	----
EP075G: Chlorinated Hydrocarbons								
1.3-Dichlorobenzene	541-73-1	2	µg/L	<2	----	----	----	----
1.4-Dichlorobenzene	106-46-7	2	µg/L	<2	----	----	----	----
1.2-Dichlorobenzene	95-50-1	2	µg/L	<2	----	----	----	----
Hexachloroethane	67-72-1	2	µg/L	<2	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	2	µg/L	<2	----	----	----	----
Hexachloropropylene	1888-71-7	2	µg/L	<2	----	----	----	----
Hexachlorobutadiene	87-68-3	2	µg/L	<2	----	----	----	----
Hexachlorocyclopentadiene	77-47-4	10	µg/L	<10	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 1 - DURING DREDGING (FILTERED)**	**DAM 1 - DURING DREDGING (TOTAL)**	----	----	----
			Client sampling date / time	08-Feb-2017 00:00	08-Feb-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702939-001**	**ES1702939-002**	--------	--------	--------
				Result	Result	----	----	----
EP075G: Chlorinated Hydrocarbons - Continued								
Pentachlorobenzene	608-93-5	2	µg/L	<2	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	4	µg/L	<4	----	----	----	----
EP075H: Anilines and Benzidines								
Aniline	62-53-3	2	µg/L	<2	----	----	----	----
4-Chloroaniline	106-47-8	2	µg/L	<2	----	----	----	----
2-Nitroaniline	88-74-4	4	µg/L	<4	----	----	----	----
3-Nitroaniline	99-09-2	4	µg/L	<4	----	----	----	----
Dibenzofuran	132-64-9	2	µg/L	<2	----	----	----	----
4-Nitroaniline	100-01-6	2	µg/L	<2	----	----	----	----
Carbazole	86-74-8	2	µg/L	<2	----	----	----	----
3.3`-Dichlorobenzidine	91-94-1	2	µg/L	<2	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ **Total Xylenes**	1330-20-7	2	µg/L	<2	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 1 - DURING DREDGING (FILTERED)**	**DAM 1 - DURING DREDGING (TOTAL)**	**----**	**----**	**----**
			Client sampling date / time	08-Feb-2017 00:00	08-Feb-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702939-001**	**ES1702939-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP080: BTEXN - Continued								
^ **Sum of BTEX**	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP094A: Synthetic Pyrethroids								
Bioresmethrin	28434-01-07	0.5	µg/L	<0.5	----	----	----	----
Bifenthrin	82657-04-3	0.5	µg/L	<0.5	----	----	----	----
Phenothrin	26002-80-2	0.5	µg/L	<0.5	----	----	----	----
Lambda-cyhalothrin	68085-85-8	0.5	µg/L	<0.5	----	----	----	----
Permethrin	52645-53-1	0.5	µg/L	<0.5	----	----	----	----
Cyfluthrin	68359-37-5	0.5	µg/L	<0.5	----	----	----	----
Cypermethrin	52315-07-8	0.5	µg/L	<0.5	----	----	----	----
Fenvalverate & Esfenvalerate	51630-58-1/66230-04-	0.5	µg/L	<0.5	----	----	----	----
Deltamethrin & Tralomethrin	62229-77-0/66841-25-	0.5	µg/L	<0.5	----	----	----	----
Allethrin	584-79-2	0.5	µg/L	<0.5	----	----	----	----
Transfluthrin	118712-89-3	0.5	µg/L	<0.5	----	----	----	----
Tau-fluvalinate	102851-06-9	0.5	µg/L	<0.5	----	----	----	----
Tetramethrin	68085-85-8	0.5	µg/L	<0.5	----	----	----	----
EP094B: Synergist								
Piperonyl Butoxide	63993-73-7	0.5	µg/L	<0.5	----	----	----	----
EP117: Alcohols								
Ethanol	64-17-5	50	µg/L	<50	----	----	----	----
Isopropanol	67-63-0	50	µg/L	<50	----	----	----	----
n-Propanol	71-23-8	50	µg/L	<50	----	----	----	----
Isobutanol	78-83-1	50	µg/L	<50	----	----	----	----
n-Butanol	71-36-3	50	µg/L	<50	----	----	----	----
EP125A: Monocyclic Aromatic Hydrocarbons								
Benzene	71-43-2	0.05	µg/L	<0.05	----	----	----	----
Toluene	108-88-3	0.5	µg/L	**1.0**	----	----	----	----
Ethylbenzene	100-41-4	0.05	µg/L	<0.05	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.05	µg/L	**0.10**	----	----	----	----
Styrene	100-42-5	0.05	µg/L	**0.51**	----	----	----	----
ortho-Xylene	95-47-6	0.05	µg/L	<0.05	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	0.05	µg/L	<0.05	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 1 - DURING DREDGING (FILTERED)**	**DAM 1 - DURING DREDGING (TOTAL)**	----	----	----
			Client sampling date / time	08-Feb-2017 00:00	08-Feb-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702939-001**	**ES1702939-002**	--------	--------	--------
				Result	Result	----	----	----
EP125A: Monocyclic Aromatic Hydrocarbons - Continued								
1.2.4-Trimethylbenzene	95-63-6	0.05	µg/L	<0.05	----	----	----	----
EP125D: Fumigants								
1.2-Dichloropropane	78-87-5	0.1	µg/L	<0.1	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.1	µg/L	<0.1	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.1	µg/L	<0.1	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.1	µg/L	<0.1	----	----	----	----
EP125E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	0.5	µg/L	<0.5	----	----	----	----
Vinyl chloride	75-01-4	0.3	µg/L	<0.3	----	----	----	----
Bromomethane	74-83-9	0.5	µg/L	<0.5	----	----	----	----
Chloroethane	75-00-3	0.5	µg/L	<0.5	----	----	----	----
Trichlorofluoromethane	75-69-4	0.5	µg/L	<0.5	----	----	----	----
1.1-Dichloroethene	75-35-4	0.1	µg/L	<0.1	----	----	----	----
Dichloromethane	75-09-2	1	µg/L	<1.0	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	0.1	µg/L	<0.1	----	----	----	----
1.1-Dichloroethane	75-34-3	0.1	µg/L	<0.1	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	0.1	µg/L	<0.1	----	----	----	----
Bromochloromethane	74-97-5	0.5	µg/L	<0.5	----	----	----	----
1.2-Dichloroethane	107-06-2	0.1	µg/L	<0.1	----	----	----	----
1.1.1-Trichloroethane	71-55-6	0.1	µg/L	<0.1	----	----	----	----
Carbon Tetrachloride	56-23-5	0.05	µg/L	<0.05	----	----	----	----
Trichloroethene	79-01-6	0.05	µg/L	<0.05	----	----	----	----
Tetrachloroethene	127-18-4	0.05	µg/L	<0.05	----	----	----	----
Hexachlorobutadiene	87-68-3	0.04	µg/L	<0.04	----	----	----	----
EP125F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	0.1	µg/L	**0.31**	----	----	----	----
Bromobenzene	108-86-1	0.1	µg/L	<0.10	----	----	----	----
Benzylchloride	100-44-7	0.2	µg/L	<0.2	----	----	----	----
1.3-Dichlorobenzene	541-73-1	0.1	µg/L	<0.10	----	----	----	----
1.4-Dichlorobenzene	106-46-7	0.1	µg/L	<0.10	----	----	----	----
1.2-Dichlorobenzene	95-50-1	0.1	µg/L	<0.10	----	----	----	----
2-Chlorotoluene	95-49-8	0.1	µg/L	<0.1	----	----	----	----
4-Chlorotoluene	106-43-4	0.1	µg/L	<0.1	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.1	µg/L	<0.1	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 1 - DURING DREDGING (FILTERED)**	**DAM 1 - DURING DREDGING (TOTAL)**	**----**	**----**	**----**
			Client sampling date / time	08-Feb-2017 00:00	08-Feb-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702939-001**	**ES1702939-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP125F: Halogenated Aromatic Compounds - Continued								
1.2.3-Trichlorobenzene	87-61-6	0.1	µg/L	<0.1	----	----	----	----
^ **Trichlorobenzenes (Sum)**	----	0.1	µg/L	<0.1	----	----	----	----
EP125G: Trihalomethanes								
Chloroform	67-66-3	0.1	µg/L	**0.32**	----	----	----	----
Bromodichloromethane	75-27-4	0.1	µg/L	<0.10	----	----	----	----
Dibromochloromethane	124-48-1	0.1	µg/L	<0.10	----	----	----	----
Bromoform	75-25-2	0.1	µg/L	<0.10	----	----	----	----
^ **Total Trihalomethanes**	----	0.1	µg/L	**0.32**	----	----	----	----
EP125H: Naphthalene								
Naphthalene	91-20-3	0.05	µg/L	**0.05**	----	----	----	----
EP125L: Methyl t-butyl ether								
Methyl tert-butyl ether (MTBE)	1634-04-4	0.1	µg/L	<0.1	----	----	----	----
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.01	µg/L	<0.010	----	----	----	----
alpha-BHC	319-84-6	0.01	µg/L	<0.010	----	----	----	----
beta-BHC	319-85-7	0.01	µg/L	<0.010	----	----	----	----
delta-BHC	319-86-8	0.01	µg/L	<0.010	----	----	----	----
4.4`-DDD	72-54-8	0.01	µg/L	<0.010	----	----	----	----
4.4`-DDE	72-55-9	0.01	µg/L	<0.010	----	----	----	----
4.4`-DDT	50-29-3	0.01	µg/L	<0.010	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.01	µg/L	<0.010	----	----	----	----
Dieldrin	60-57-1	0.01	µg/L	<0.010	----	----	----	----
alpha-Endosulfan	959-98-8	0.01	µg/L	<0.010	----	----	----	----
beta-Endosulfan	33213-65-9	0.01	µg/L	<0.010	----	----	----	----
Endosulfan sulfate	1031-07-8	0.01	µg/L	<0.010	----	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.01	µg/L	<0.010	----	----	----	----
Endrin	72-20-8	0.01	µg/L	<0.010	----	----	----	----
Endrin aldehyde	7421-93-4	0.01	µg/L	<0.010	----	----	----	----
Endrin ketone	53494-70-5	0.01	µg/L	<0.010	----	----	----	----
Heptachlor	76-44-8	0.005	µg/L	<0.005	----	----	----	----
Heptachlor epoxide	1024-57-3	0.01	µg/L	<0.010	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.01	µg/L	<0.010	----	----	----	----
gamma-BHC	58-89-9	0.01	µg/L	<0.010	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**DAM 1 - DURING DREDGING (FILTERED)**	**DAM 1 - DURING DREDGING (TOTAL)**	----	----	----
			Client sampling date / time	08-Feb-2017 00:00	08-Feb-2017 00:00	----	----	----
Compound	CAS Number	LOR	Unit	**ES1702939-001**	**ES1702939-002**	--------	--------	--------
				Result	Result	----	----	----
EP131A: Organochlorine Pesticides - Continued								
Methoxychlor	72-43-5	0.01	µg/L	<0.010	----	----	----	----
cis-Chlordane	5103-71-9	0.01	µg/L	<0.010	----	----	----	----
trans-Chlordane	5103-74-2	0.01	µg/L	<0.010	----	----	----	----
^ **Total Chlordane (sum)**	----	0.01	µg/L	<0.010	----	----	----	----
Oxychlordane	27304-13-8	0.01	µg/L	<0.010	----	----	----	----
EP131B: Polychlorinated Biphenyls (as Aroclors)								
Total Polychlorinated biphenyls	----	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1016	12674-11-2	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1221	11104-28-2	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1232	11141-16-5	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1242	53469-21-9	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1248	12672-29-6	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1254	11097-69-1	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1260	11096-82-5	0.1	µg/L	<0.10	----	----	----	----
EP132C: Chlorinated Naphthalenes								
1-Chloronaphthalene	90-13-1	0.1	µg/L	<0.1	----	----	----	----
2-Chloronaphthalene	91-58-7	0.1	µg/L	<0.1	----	----	----	----
^ **Chloronaphthalenes (1- + 2-)**	----	0.1	µg/L	<0.1	----	----	----	----
EP203A: Explosives								
HMX	2691-41-0	1	µg/L	<1.0	----	----	----	----
RDX	----	1	µg/L	<1.0	----	----	----	----
1.3.5-Trinitrobenzene	99-35-4	1	µg/L	<1.0	----	----	----	----
1.3-Dinitrobenzene	99-65-0	1	µg/L	<1.0	----	----	----	----
Tetryl	479-45-8	1	µg/L	<1.0	----	----	----	----
2.4.6-TNT	118-96-7	1	µg/L	<1.0	----	----	----	----
4-Amino.2.6-DNT	19406-51-0	1	µg/L	<1.0	----	----	----	----
2-Amino-4.6-DNT	35572-78-2	1	µg/L	<1.0	----	----	----	----
4-& 2-AM-DNT(Isomeric Mixture)	----	1	µg/L	<1.0	----	----	----	----
2.4-Dinitrotoluene	121-14-2	1	µg/L	<1.0	----	----	----	----
2.6-Dinitrotoluene	606-20-2	1	µg/L	<1.0	----	----	----	----
2.4-& 2.6-DNT(Isomeric Mixture)	51-28-5/606-20-2	1	µg/L	<1.0	----	----	----	----
Nitrobenzene	98-95-3	1	µg/L	<1.0	----	----	----	----
2-Nitrotoluene	88-72-2	1	µg/L	<1.0	----	----	----	----
3-Nitrotoluene	99-08-1	1	µg/L	<1.0	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 1 - DURING DREDGING (FILTERED)**	**DAM 1 - DURING DREDGING (TOTAL)**	**----**	**----**	**----**
			Client sampling date / time	08-Feb-2017 00:00	08-Feb-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702939-001**	**ES1702939-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP203A: Explosives - Continued								
4-Nitrotoluene	99-99-0	1	µg/L	<1.0	----	----	----	----
Nitroglycerine	55-63-0	5	µg/L	<5	----	----	----	----
PETN	78-11-5	5	µg/L	<5	----	----	----	----
EP234: Multiresidue Pesticides (ESI Positive)								
3-Hydroxy Carbofuran	16655-82-6	0.02	µg/L	<0.02	----	----	----	----
Abamectin	71751-41-2	0.1	µg/L	<0.1	----	----	----	----
Acephate	30560-19-1	0.5	µg/L	<0.5	----	----	----	----
Alachlor	15972-60-8	0.1	µg/L	<0.1	----	----	----	----
Aldicarb	116-06-3	0.05	µg/L	<0.05	----	----	----	----
Ametryn	834-12-8	0.01	µg/L	<0.01	----	----	----	----
Aminopyralid	150114-71-9	0.1	µg/L	<0.1	----	----	----	----
Amitraz	33089-61-1	100	µg/L	<100	----	----	----	----
Atrazine	1912-24-9	0.01	µg/L	<0.01	----	----	----	----
Atrazine-desethyl	6190-65-4	0.1	µg/L	<0.1	----	----	----	----
Atrazine-desisopropyl	1007-28-9	0.1	µg/L	<0.1	----	----	----	----
Azinphos-ethyl	2642-71-9	0.02	µg/L	<0.02	----	----	----	----
Azinphos-methyl	86-50-0	0.02	µg/L	<0.02	----	----	----	----
Azoxystrobin	131860-33-8	0.1	µg/L	<0.1	----	----	----	----
Bendiocarb	22781-23-3	0.1	µg/L	<0.10	----	----	----	----
Benomyl	17804-35-2	0.01	µg/L	**0.26**	----	----	----	----
Bensulfuron methyl	83055-99-6	0.1	µg/L	<0.1	----	----	----	----
Bensulide	741-58-2	0.1	µg/L	<0.1	----	----	----	----
Boscalid	188425-85-6	0.1	µg/L	<0.1	----	----	----	----
Bromacil	314-40-9	0.02	µg/L	<0.02	----	----	----	----
Bromophos-ethyl	4824-78-6	0.1	µg/L	<0.10	----	----	----	----
Butachlor	23184-66-9	0.1	µg/L	<0.1	----	----	----	----
Carbaryl	63-25-2	0.01	µg/L	<0.01	----	----	----	----
Carbendazim (Thiophanate methyl)	10605-21-7	0.1	µg/L	<0.1	----	----	----	----
Carbofenothion	786-19-6	0.02	µg/L	<0.02	----	----	----	----
Carbofuran	1563-66-2	0.01	µg/L	<0.01	----	----	----	----
Carboxin	5234-68-4	0.1	µg/L	<0.1	----	----	----	----
Carfentrazone-ethyl	128639-02-1	0.1	µg/L	<0.1	----	----	----	----
Chlorantraniliprole	500008-45-7	0.1	µg/L	<0.1	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 1 - DURING DREDGING (FILTERED)**	**DAM 1 - DURING DREDGING (TOTAL)**	----	----	----
			Client sampling date / time	08-Feb-2017 00:00	08-Feb-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702939-001**	**ES1702939-002**	--------	--------	--------
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Chlorfenvinphos	470-90-6	0.02	µg/L	<0.02	----	----	----	----
Chloroxuron	1982-47-4	0.1	µg/L	<0.1	----	----	----	----
Chlorpyrifos	2921-88-2	0.02	µg/L	<0.02	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.1	µg/L	<0.2	----	----	----	----
Chlorsulfuron	64902-72-3	0.2	µg/L	<0.2	----	----	----	----
Coumaphos	56-72-4	0.01	µg/L	<0.01	----	----	----	----
Cyanazine	21725-46-2	0.02	µg/L	<0.02	----	----	----	----
Cyproconazole	94361-06-5	0.02	µg/L	<0.02	----	----	----	----
Cyprodinil	121552-61-2	0.01	µg/L	<0.01	----	----	----	----
Cyromazine	66215-27-8	0.05	µg/L	<0.05	----	----	----	----
Demeton-O	298-03-0	0.02	µg/L	<0.02	----	----	----	----
Demeton-O & Demeton-S	298-03-3/126-75-0	0.02	µg/L	<0.02	----	----	----	----
Demeton-S	126-75-0	0.02	µg/L	<0.02	----	----	----	----
Demeton-S-methyl	919-86-8	0.02	µg/L	<0.02	----	----	----	----
Diazinon	333-41-5	0.01	µg/L	**0.16**	----	----	----	----
Dichlobenil	1194-65-6	0.1	µg/L	<0.1	----	----	----	----
Dichlorvos	62-73-7	0.2	µg/L	<0.20	----	----	----	----
Diclofop-methyl	51338-27-3	0.05	µg/L	<0.05	----	----	----	----
Difenoconazole	119446-68-3	0.02	µg/L	<0.02	----	----	----	----
Diflubenzuron	35367-38-5	0.1	µg/L	<0.1	----	----	----	----
Dimethoate	60-51-5	0.02	µg/L	<0.02	----	----	----	----
Diphenamid	957-51-7	0.1	µg/L	<0.1	----	----	----	----
Disulfoton	298-04-4	0.05	µg/L	<0.05	----	----	----	----
Diuron	330-54-1	0.02	µg/L	<0.02	----	----	----	----
EPN	2104-64-5	0.05	µg/L	<0.05	----	----	----	----
EPTC	759-94-4	0.1	µg/L	<0.1	----	----	----	----
Ethion	563-12-2	0.02	µg/L	<0.02	----	----	----	----
Ethoprophos	13194-48-4	0.01	µg/L	<0.01	----	----	----	----
Etridiazole	2593-15-9	0.5	µg/L	<0.5	----	----	----	----
Fenamiphos	22224-92-6	0.01	µg/L	<0.01	----	----	----	----
Fenarimol	60168-88-9	0.02	µg/L	<0.02	----	----	----	----
Fenchlorphos (Ronnel)	299-84-3	10	µg/L	<10	----	----	----	----
Fenitrothion	122-14-5	2	µg/L	<2	----	----	----	----
Fenoxycarb	79127-80-3	0.1	µg/L	<0.1	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 1 - DURING DREDGING (FILTERED)**	**DAM 1 - DURING DREDGING (TOTAL)**	**----**	**----**	**----**
			Client sampling date / time	08-Feb-2017 00:00	08-Feb-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702939-001**	**ES1702939-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Fensulfothion	115-90-2	0.01	µg/L	<0.01	----	----	----	----
Fenthion	55-38-9	0.05	µg/L	<0.05	----	----	----	----
Flamprop methyl	52756-25-9	0.1	µg/L	<0.1	----	----	----	----
Fluometuron	2164-17-2	0.01	µg/L	<0.01	----	----	----	----
Flusilazole	85509-19-9	0.02	µg/L	<0.02	----	----	----	----
Formothion	2540-82-1	20	µg/L	<20	----	----	----	----
Fosetyl Aluminium	39148-24-8	10	µg/L	<10	----	----	----	----
Haloxyfop	69806-34-4	0.1	µg/L	<0.1	----	----	----	----
Hexaconazole	79983-71-4	0.02	µg/L	<0.02	----	----	----	----
Hexazinone	51235-04-2	0.02	µg/L	<0.02	----	----	----	----
Imazapyr	94795-74-1	10	µg/L	<10.0	----	----	----	----
Indoxacarb	173584-44-6	0.1	µg/L	<0.1	----	----	----	----
Iodosulfuron methyl	144550-36-7	0.1	µg/L	<0.1	----	----	----	----
Irgarol	28159-98-0	0.002	µg/L	**0.003**	----	----	----	----
Isoproturon	34123-59-6	0.1	µg/L	<0.1	----	----	----	----
Malathion	121-75-5	0.02	µg/L	<0.02	----	----	----	----
Metalaxyl	57837-19-1	0.1	µg/L	<0.1	----	----	----	----
Metalaxyl-M	70630-17-0	0.1	µg/L	<0.1	----	----	----	----
Metaldehyde	108-62-3	10	µg/L	<10	----	----	----	----
Methidathion	950-37-8	0.1	µg/L	<0.1	----	----	----	----
Methiocarb	2032-65-7	0.01	µg/L	<0.01	----	----	----	----
Methomyl	16752-77-5	0.01	µg/L	<0.01	----	----	----	----
Metolachlor	51218-45-2	0.01	µg/L	<0.01	----	----	----	----
Metribuzin	21087-64-9	0.02	µg/L	<0.02	----	----	----	----
Mevinphos	7786-34-7	0.02	µg/L	<0.02	----	----	----	----
Molinate	2212-67-1	0.1	µg/L	<0.1	----	----	----	----
Monocrotophos	6923-22-4	0.02	µg/L	<0.02	----	----	----	----
Myclobutanil	88671-89-0	0.1	µg/L	<0.1	----	----	----	----
Naftalofos	1491-41-4	1	µg/L	<1.0	----	----	----	----
Napropamide	15299-99-7	0.1	µg/L	<0.1	----	----	----	----
Nitralin	4726-14-1	0.1	µg/L	<0.1	----	----	----	----
Norflurazon	27314-13-2	0.1	µg/L	<0.1	----	----	----	----
Novaluron	116714-46-6	0.1	µg/L	<0.1	----	----	----	----
Omethoate	1113-02-6	0.01	µg/L	<0.01	----	----	----	----

Analytical Results

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

			Client sample ID	**DAM 1 - DURING DREDGING (FILTERED)**	**DAM 1 - DURING DREDGING (TOTAL)**	**----**	**----**	**----**
			Client sampling date / time	08-Feb-2017 00:00	08-Feb-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702939-001**	**ES1702939-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Oxamyl	23135-22-0	0.01	µg/L	<0.01	----	----	----	----
Oxyfluorfen	42874-03-3	1	µg/L	<1.0	----	----	----	----
Paclobutrazole	76738-62-0	0.05	µg/L	<0.05	----	----	----	----
Parathion	56-38-2	0.2	µg/L	<0.2	----	----	----	----
Parathion-methyl	298-00-0	0.5	µg/L	<0.5	----	----	----	----
Pebulate	1114-71-2	0.1	µg/L	<0.1	----	----	----	----
Penconazole	66246-88-6	0.01	µg/L	<0.01	----	----	----	----
Pendimethalin	40487-42-1	0.05	µg/L	<0.05	----	----	----	----
Phorate	298-02-2	0.1	µg/L	<0.1	----	----	----	----
Pirimicarb	23103-98-2	0.1	µg/L	<0.1	----	----	----	----
Pirimiphos-ethyl	23505-41-1	0.01	µg/L	<0.01	----	----	----	----
Pirimiphos-methyl	29232-93-7	0.01	µg/L	<0.01	----	----	----	----
Prochloraz	67747-09-5	0.1	µg/L	<0.1	----	----	----	----
Profenofos	41198-08-7	0.01	µg/L	<0.01	----	----	----	----
Promecarb	2631-37-0	0.1	µg/L	<0.1	----	----	----	----
Prometryn	7287-19-6	0.01	µg/L	<0.01	----	----	----	----
Propachlor	1918-16-7	0.1	µg/L	<0.1	----	----	----	----
Propamocarb	24579-73-5	0.1	µg/L	<0.1	----	----	----	----
Propargite	2312-35-8	0.1	µg/L	<0.1	----	----	----	----
Propazine	139-40-2	0.01	µg/L	<0.01	----	----	----	----
Propiconazole	60207-90-1	0.05	µg/L	<0.05	----	----	----	----
Propyzamide	23950-58-5	0.1	µg/L	<0.1	----	----	----	----
Prothiofos	34643-46-4	0.1	µg/L	<0.1	----	----	----	----
Pyraclostrobin	175013-18-0	0.1	µg/L	<0.1	----	----	----	----
Pyrazophos	13457-18-6	0.1	µg/L	<0.1	----	----	----	----
Pyrimethanil	53112-28-0	0.02	µg/L	<0.02	----	----	----	----
Pyriproxyfen	95737-68-1	0.1	µg/L	<0.1	----	----	----	----
Pyroxsulam	422556-08-9	0.1	µg/L	<0.1	----	----	----	----
Quinclorac	84087-01-4	0.1	µg/L	<0.1	----	----	----	----
Rimsulfuron	122931-48-0	0.1	µg/L	<0.1	----	----	----	----
Siduron	1982-49-6	0.1	µg/L	<0.1	----	----	----	----
Simazine	122-34-9	0.02	µg/L	<0.02	----	----	----	----
Spirotetramat	203313-25-1	0.1	µg/L	<0.1	----	----	----	----
Sulfotep	3689-24-5	0.005	µg/L	<0.005	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 1 - DURING DREDGING (FILTERED)**	**DAM 1 - DURING DREDGING (TOTAL)**	----	----	----
			Client sampling date / time	08-Feb-2017 00:00	08-Feb-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702939-001**	**ES1702939-002**	--------	--------	--------
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Sulprofos	35400-43-2	0.05	µg/L	<0.05	----	----	----	----
Tebuconazole	107534-96-3	0.01	µg/L	<0.01	----	----	----	----
Tebuthiuron	34014-18-1	0.02	µg/L	<0.02	----	----	----	----
Temephos	3383-96-8	0.02	µg/L	<0.02	----	----	----	----
Terbacil	5902-51-2	0.1	µg/L	<0.1	----	----	----	----
Terbufos	13071-79-9	0.01	µg/L	<0.01	----	----	----	----
Terbuthylazine	5915-41-3	0.01	µg/L	<0.01	----	----	----	----
Terbutryn	886-50-0	0.01	µg/L	<0.01	----	----	----	----
Tetrachlorvinphos	22248-79-9	0.01	µg/L	<0.01	----	----	----	----
Tetraconazole	112281-77-3	0.1	µg/L	<0.1	----	----	----	----
Thiamethoxam	153719-23-4	0.02	µg/L	<0.02	----	----	----	----
Thiobencarb	28249-77-6	0.01	µg/L	<0.01	----	----	----	----
Thiodicarb	59669-26-0	0.01	µg/L	<0.01	----	----	----	----
Thiometon	640-15-3	0.5	µg/L	<0.5	----	----	----	----
Toltrazuril	69004-03-1	0.5	µg/L	<0.5	----	----	----	----
Triadimefon	43121-43-3	0.1	µg/L	<0.1	----	----	----	----
Triadimenol	55219-65-3	0.1	µg/L	<0.1	----	----	----	----
Triazophos	24017-47-8	0.005	µg/L	<0.005	----	----	----	----
Trichlorfon	52-68-6	0.02	µg/L	<0.02	----	----	----	----
Trichloronate	327-98-0	0.5	µg/L	<0.5	----	----	----	----
Trifloxystrobin	141517-21-7	0.1	µg/L	<0.1	----	----	----	----
Trifloxysulfuron-sodium	199119-58-9	0.1	µg/L	<0.1	----	----	----	----
Trifluralin	1582-09-8	10	µg/L	<10.0	----	----	----	----
Trinexapac Ethyl	95266-40-3	1	µg/L	<1	----	----	----	----
Vernolate	1929-77-7	0.1	µg/L	<0.1	----	----	----	----
EP247: Phenolics and Related Compounds								
2,4-Dinitrophenol	51-28-5	0.01	µg/L	**0.03**	----	----	----	----
2-Methyl-4.6-dinitrophenol	8071-51-0	0.05	µg/L	<0.05	----	----	----	----
4-Nonylphenol (mixture of isomers)	84852-15-3	0.1	µg/L	**0.20**	----	----	----	----
Hexachlorophene	70-30-4	0.1	µg/L	<0.10	----	----	----	----
4-Nitrophenol	100-02-7	0.1	µg/L	**0.48**	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.1	µg/L	**0.52**	----	----	----	----
Pentachlorophenol	87-86-5	0.1	µg/L	**0.41**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 1 - DURING DREDGING (FILTERED)**	**DAM 1 - DURING DREDGING (TOTAL)**	----	----	----
			Client sampling date / time	08-Feb-2017 00:00	08-Feb-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1702939-001**	**ES1702939-002**	--------	--------	--------
				Result	Result	----	----	----
EP247: Phenolics and Related Compounds - Continued								
Dinoseb	88-85-7	0.1	µg/L	<0.10	----	----	----	----
Dalapon	75-99-0	0.1	µg/L	<0.10	----	----	----	----
Bisphenol-A	80-05-7	0.05	µg/L	**0.36**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	**8.88**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%	**12.0**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%	**Not Determined**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	**74.2**	----	----	----	----
Anthracene-d10	1719-06-8	1	%	**96.1**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1	%	**84.2**	----	----	----	----
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	2	%	**5.26**	----	----	----	----
Phenol-d6	13127-88-3	2	%	**17.0**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	2	%	**9.95**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	2	%	**3.67**	----	----	----	----
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	2	%	**67.2**	----	----	----	----
1.2-Dichlorobenzene-D4	2199-69-1	2	%	**64.1**	----	----	----	----
2-Fluorobiphenyl	321-60-8	2	%	**77.5**	----	----	----	----
Anthracene-d10	1719-06-8	2	%	**86.2**	----	----	----	----
4-Terphenyl-d14	1718-51-0	2	%	**73.2**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**112**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**99.2**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**102**	----	----	----	----
EP094S: Pesticide Surrogate								
DEF	78-48-8	0.5	%	**95.0**	----	----	----	----
EP125S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**102**	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	**102**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**102**	----	----	----	----
EP131S: OC Pesticide Surrogate								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**DAM 1 - DURING DREDGING (FILTERED)**	**DAM 1 - DURING DREDGING (TOTAL)**	**----**	**----**	**----**
			Client sampling date / time	08-Feb-2017 00:00	08-Feb-2017 00:00	----	----	----
Compound	CAS Number	LOR	Unit	**ES1702939-001**	**ES1702939-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP131S: OC Pesticide Surrogate - Continued								
Dibromo-DDE	21655-73-2	0.01	%	**103**	----	----	----	----
EP131T: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	**89.2**	----	----	----	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**89.6**	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%	**116**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**109**	----	----	----	----
EP203S: Explosives Surrogate								
o-Dinitrobenzene	528-29-0	1	%	**112**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

		Recovery Limits (%)	
Compound	*CAS Number*	**Low**	**High**
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	10	117
Phenol-d6	13127-88-3	10	69
2-Chlorophenol-D4	93951-73-6	21	130
2.4.6-Tribromophenol	118-79-6	10	151
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	29	142
1.2-Dichlorobenzene-D4	2199-69-1	24	121
2-Fluorobiphenyl	321-60-8	27	135
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	21	123
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128
EP094S: Pesticide Surrogate			
DEF	78-48-8	42	143
EP125S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	65	127
4-Bromofluorobenzene	460-00-4	68	124
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	14	166
EP131T: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	10	144
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	135
Anthracene-d10	1719-06-8	48	138
4-Terphenyl-d14	1718-51-0	48	144
EP203S: Explosives Surrogate			

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP203S: Explosives Surrogate - Continued			
o-Dinitrobenzene	528-29-0	51	125

CERTIFICATE OF ANALYSIS

Work Order	: **ES1704754**	Page	: 1 of 20
Client	: **BORAL RECYCLING - WIDEMERE**	Laboratory	: Environmental Division Sydney
Contact	: PHILIP PATERSON	Contact	: Customer Services ES
Address	: Boral Recycling Wetherill Park, NSW 2164	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: 02 9604 9101	Telephone	: +61-2-8784 8555
Project	: SURFACE WATER ANALYSIS	Date Samples Received	: 01-Mar-2017 13:55
Order number	: tba	Date Analysis Commenced	: 01-Mar-2017
C-O-C number	: ----	Issue Date	: 16-Mar-2017 15:44
Sampler	: CHRIS V.		
Site	: ----		
Quote number	: SY/662/16 V4		
No. of samples received	: 4		
No. of samples analysed	: 4		

ilac-MRA NATA

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Amanda Conkie	Organic Chemist	Brisbane Organics, Stafford, QLD
Ashesh Patel	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Dian Dao		Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW
Vyoma Tailor	Microbiologist	Sydney Microbiology, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- EG093: Samples ES1704754 #001, 003 were run on EG094 method due to low TDS content.
- EP247 :Poor spike recovery due to matrix interferences(confirmed by re-analysis).
- CFU = colony forming unit
- MF = membrane filtration
- Microbiological Comment: HPC results are reported an approximate (~) when the count of colonies on the plate is outside the range of 10 - 300cfu, in accordance with ALS work instruction QWI-MIC/MW002.
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
-
- EP125: Matrix spike recovery bias low due to sample matrix effects. This has been confirmed by re-analysis.
- EP050: The MBAS reported is calculated as LAS, mol wt ____342___.
- According to ALS work instruction for membrane filtration, the suggested volume for filtration of non treated / non-drinking water starts from 10mL or 50mL if the sample is turbid. A result of <10 or <2cfu/100mL is reported when there is no target organism growth from a volume of 10 or 50mL respectively.
- HPC results are reported as an estimate (~) when the count of colonies on the plate is outside the range of 10 - 300cfu, in accordance with ALS work instruction QWI-MIC/MW002, or 25-250 cfu for MW003.
- Total PAH reported as the sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene and Benzo(g,h,i)perylene.
- EP075: 'Sum of PAH' is the sum of the USEPA 16 priority PAHs
- MW002 is ALS's internal code and is equivalent to AS4276.3.1.
- MW006 is ALS's internal code and is equivalent to AS4276.7.
- MW007 is ALS's internal code and is equivalent to AS4276.5.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**INFLOW DAM 1 - FILTERED**	**INFLOW DAM 1 - TOTAL**	**POST DREDGING - FILTERED**	**POST DREDGING - TOTAL**	**----**
			Client sampling date / time	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704754-001**	**ES1704754-002**	**ES1704754-003**	**ES1704754-004**	**--------**
				Result	Result	Result	Result	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**10.9**	**10.4**	**9.49**	**9.34**	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**829**	**700**	**333**	**394**	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**9**	**122**	**6**	**74**	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	<0.1	**133**	**0.4**	**76.7**	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	**60**	----	**35**	----	----
EA075: Redox Potential								
Redox Potential	----	0.1	mV	**52.0**	----	**102**	----	----
pH Redox	----	0.01	pH Unit	**11.5**	----	**10.0**	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**109**	----	**79**	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**50**	----	**32**	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**24**	----	**14**	----	----
Magnesium	7439-95-4	1	mg/L	<1	----	<1	----	----
Sodium	7440-23-5	1	mg/L	**89**	----	**45**	----	----
Potassium	7440-09-7	1	mg/L	**47**	----	**23**	----	----
EG020F: Dissolved Metals by ICP-MS								
Gallium	7440-55-3	0.001	mg/L	**0.006**	----	**0.002**	----	----
Lanthanum	7439-91-0	0.001	mg/L	<0.001	----	<0.001	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.00004	mg/L	<0.00004	----	<0.00004	----	----
EG049G LL-F: Dissolved Trivalent Chromium - Low Level								
Trivalent Chromium	16065-83-1	0.001	mg/L	<0.001	----	<0.001	----	----
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level								
Hexavalent Chromium	18540-29-9	0.001	mg/L	**0.040**	----	**0.018**	----	----
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	**18.0**	----	**10.9**	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**INFLOW DAM 1 - FILTERED**	**INFLOW DAM 1 - TOTAL**	**POST DREDGING - FILTERED**	**POST DREDGING - TOTAL**	----
			Client sampling date / time	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704754-001**	**ES1704754-002**	**ES1704754-003**	**ES1704754-004**	--------
				Result	Result	Result	Result	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS - Continued								
Aluminium	7429-90-5	5	µg/L	**2380**	----	**795**	----	----
Antimony	7440-36-0	0.5	µg/L	**2.7**	----	**2.2**	----	----
Arsenic	7440-38-2	0.5	µg/L	**1.9**	----	**1.6**	----	----
Barium	7440-39-3	1	µg/L	**10**	----	**5**	----	----
Beryllium	7440-41-7	0.1	µg/L	<0.1	----	<0.1	----	----
Bismuth	7440-69-9	0.1	µg/L	<0.1	----	<0.1	----	----
Boron	7440-42-8	100	µg/L	<100	----	<100	----	----
Cadmium	7440-43-9	0.2	µg/L	<0.2	----	<0.2	----	----
Chromium	7440-47-3	0.5	µg/L	**31.5**	----	**13.4**	----	----
Cobalt	7440-48-4	0.2	µg/L	**2.2**	----	**0.7**	----	----
Copper	7440-50-8	1	µg/L	**24**	----	**8**	----	----
Iron	7439-89-6	5	µg/L	**36**	----	**16**	----	----
Lead	7439-92-1	0.2	µg/L	**0.5**	----	<0.2	----	----
Manganese	7439-96-5	0.5	µg/L	<0.5	----	<0.5	----	----
Molybdenum	7439-98-7	0.1	µg/L	**25.5**	----	**13.8**	----	----
Nickel	7440-02-0	0.5	µg/L	**4.1**	----	**1.6**	----	----
Selenium	7782-49-2	2	µg/L	<2	----	<2	----	----
Silver	7440-22-4	0.1	µg/L	<0.1	----	<0.1	----	----
Strontium	7440-24-6	10	µg/L	**176**	----	**90**	----	----
Thallium	7440-28-0	0.1	µg/L	<0.1	----	<0.1	----	----
Tin	7440-31-5	5	µg/L	<5	----	<5	----	----
Uranium	7440-61-1	0.1	µg/L	<0.1	----	<0.1	----	----
Vanadium	7440-62-2	0.5	µg/L	**53.4**	----	**44.9**	----	----
Zinc	7440-66-6	5	µg/L	<5	----	<5	----	----
EK010-1: Chlorine								
Total Residual Chlorine	----	0.02	mg/L	**0.03**	----	**0.03**	----	----
EK025SF: Free CN by Segmented Flow Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	----	<0.004	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	**0.010**	----	<0.004	----	----
EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser								
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	----	<0.004	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.2**	----	**0.3**	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**INFLOW DAM 1 - FILTERED**	**INFLOW DAM 1 - TOTAL**	**POST DREDGING - FILTERED**	**POST DREDGING - TOTAL**	**----**
			Client sampling date / time	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704754-001**	**ES1704754-002**	**ES1704754-003**	**ES1704754-004**	**--------**
				Result	Result	Result	Result	----
EK084: Un-ionized Hydrogen Sulfide								
Unionized Hydrogen Sulfide	----	0.1	mg/L	<0.1	----	<0.1	----	----
EK255A: Ammonia								
Ammonia as N	7664-41-7	0.005	mg/L	**0.114**	----	**0.113**	----	----
EK257A: Nitrite								
Nitrite as N	14797-65-0	0.002	mg/L	**1.06**	----	**1.06**	----	----
EK258A: Nitrate								
Nitrate as N	14797-55-8	0.002	mg/L	**10.7**	----	**1.94**	----	----
EK259A: Nitrite and Nitrate (NOx)								
Nitrite + Nitrate as N	----	0.002	mg/L	**11.8**	----	**3.00**	----	----
EK261A: Total Kjeldahl Nitrogen								
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	**1.00**	----	**1.92**	----	----
EK262A: Total Nitrogen								
Total Nitrogen as N	----	0.01	mg/L	**12.8**	----	**4.92**	----	----
EK267A: Total Phosphorus (Persulfate Digestion)								
Total Phosphorus as P	----	0.005	mg/L	**0.022**	----	**0.009**	----	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	**15**	----	**7**	----	----
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	<1	----	<1	----	----
EP020: Oil and Grease (O&G)								
Oil & Grease	----	5	mg/L	----	**6**	----	<5	----
EP026SPF: Chemical Oxygen Demand (Spectrophotometric); Filtered								
Chemical Oxygen Demand - Filtered	----	10	mg/L	**58**	----	**36**	----	----
EP030F: Biochemical Oxygen Demand (Filtered)								
Biochemical Oxygen Demand (Filtered)	----	2	mg/L	<2	----	<2	----	----
EP050: Anionic Surfactants as MBAS								
Anionic Surfactants as MBAS	----	0.1	mg/L	**0.2**	----	<0.1	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1	µg/L	<1.0	----	<1.0	----	----
2-Chlorophenol	95-57-8	1	µg/L	<1.0	----	<1.0	----	----
2-Methylphenol	95-48-7	1	µg/L	<1.0	----	<1.0	----	----
3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	----	<2.0	----	----
2-Nitrophenol	88-75-5	1	µg/L	<1.0	----	<1.0	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**INFLOW DAM 1 - FILTERED**	**INFLOW DAM 1 - TOTAL**	**POST DREDGING - FILTERED**	**POST DREDGING - TOTAL**	**----**
			Client sampling date / time	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704754-001**	**ES1704754-002**	**ES1704754-003**	**ES1704754-004**	**--------**
				Result	Result	Result	Result	----
EP075(SIM)A: Phenolic Compounds - Continued								
2.4-Dimethylphenol	105-67-9	1	µg/L	<1.0	----	<1.0	----	----
2.4-Dichlorophenol	120-83-2	1	µg/L	<1.0	----	<1.0	----	----
2.6-Dichlorophenol	87-65-0	1	µg/L	<1.0	----	<1.0	----	----
4-Chloro-3-methylphenol	59-50-7	1	µg/L	<1.0	----	<1.0	----	----
2.4.6-Trichlorophenol	88-06-2	1	µg/L	<1.0	----	<1.0	----	----
2.4.5-Trichlorophenol	95-95-4	1	µg/L	<1.0	----	<1.0	----	----
Pentachlorophenol	87-86-5	2	µg/L	<2.0	----	<2.0	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	----	<1.0	----	----
Acenaphthylene	208-96-8	1	µg/L	<1.0	----	<1.0	----	----
Acenaphthene	83-32-9	1	µg/L	<1.0	----	<1.0	----	----
Fluorene	86-73-7	1	µg/L	<1.0	----	<1.0	----	----
Phenanthrene	85-01-8	1	µg/L	<1.0	----	<1.0	----	----
Anthracene	120-12-7	1	µg/L	<1.0	----	<1.0	----	----
Fluoranthene	206-44-0	1	µg/L	<1.0	----	<1.0	----	----
Pyrene	129-00-0	1	µg/L	<1.0	----	<1.0	----	----
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	----	<1.0	----	----
Chrysene	218-01-9	1	µg/L	<1.0	----	<1.0	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	----	<1.0	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	----	<1.0	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	----	<1.0	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	----	<1.0	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	----	<1.0	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	----	<0.5	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	----	<0.5	----	----
EP075C: Phthalate Esters								
Dimethyl phthalate	131-11-3	2	µg/L	<2	----	<2	----	----
Diethyl phthalate	84-66-2	2	µg/L	<2	----	<2	----	----
Di-n-butyl phthalate	84-74-2	2	µg/L	<2	----	<2	----	----
Butyl benzyl phthalate	85-68-7	2	µg/L	<2	----	<2	----	----
bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L	<10	----	<10	----	----
Di-n-octylphthalate	117-84-0	2	µg/L	<2	----	<2	----	----
EP075G: Chlorinated Hydrocarbons								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**INFLOW DAM 1 - FILTERED**	**INFLOW DAM 1 - TOTAL**	**POST DREDGING - FILTERED**	**POST DREDGING - TOTAL**	----
			Client sampling date / time	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704754-001**	**ES1704754-002**	**ES1704754-003**	**ES1704754-004**	--------
				Result	Result	Result	Result	----
EP075G: Chlorinated Hydrocarbons - Continued								
1.3-Dichlorobenzene	541-73-1	2	µg/L	<2	----	<2	----	----
1.4-Dichlorobenzene	106-46-7	2	µg/L	<2	----	<2	----	----
1.2-Dichlorobenzene	95-50-1	2	µg/L	<2	----	<2	----	----
Hexachloroethane	67-72-1	2	µg/L	<2	----	<2	----	----
1.2.4-Trichlorobenzene	120-82-1	2	µg/L	<2	----	<2	----	----
Hexachloropropylene	1888-71-7	2	µg/L	<2	----	<2	----	----
Hexachlorobutadiene	87-68-3	2	µg/L	<2	----	<2	----	----
Hexachlorocyclopentadiene	77-47-4	10	µg/L	<10	----	<10	----	----
Pentachlorobenzene	608-93-5	2	µg/L	<2	----	<2	----	----
Hexachlorobenzene (HCB)	118-74-1	4	µg/L	<4	----	<4	----	----
EP075H: Anilines and Benzidines								
Aniline	62-53-3	2	µg/L	<2	----	<2	----	----
4-Chloroaniline	106-47-8	2	µg/L	<2	----	<2	----	----
2-Nitroaniline	88-74-4	4	µg/L	<4	----	<4	----	----
3-Nitroaniline	99-09-2	4	µg/L	<4	----	<4	----	----
Dibenzofuran	132-64-9	2	µg/L	<2	----	<2	----	----
4-Nitroaniline	100-01-6	2	µg/L	<2	----	<2	----	----
Carbazole	86-74-8	2	µg/L	<2	----	<2	----	----
3.3`-Dichlorobenzidine	91-94-1	2	µg/L	<2	----	<2	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	<20	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	<50	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	<100	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	<50	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	----	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	<20	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	----	<20	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	<100	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	<100	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	<100	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	----	<100	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**INFLOW DAM 1 - FILTERED**	**INFLOW DAM 1 - TOTAL**	**POST DREDGING - FILTERED**	**POST DREDGING - TOTAL**	**----**
			Client sampling date / time	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704754-001**	**ES1704754-002**	**ES1704754-003**	**ES1704754-004**	**--------**
				Result	Result	Result	Result	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued								
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	----	<100	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	<1	----	----
Toluene	108-88-3	2	µg/L	<2	----	<2	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	<2	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	<2	----	----
^ **Total Xylenes**	1330-20-7	2	µg/L	<2	----	<2	----	----
^ **Sum of BTEX**	----	1	µg/L	<1	----	<1	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	<5	----	----
EP094A: Synthetic Pyrethroids								
Bioresmethrin	28434-01-07	0.5	µg/L	<0.5	----	<0.5	----	----
Bifenthrin	82657-04-3	0.5	µg/L	<0.5	----	<0.5	----	----
Phenothrin	26002-80-2	0.5	µg/L	<0.5	----	<0.5	----	----
Lambda-cyhalothrin	68085-85-8	0.5	µg/L	<0.5	----	<0.5	----	----
Permethrin	52645-53-1	0.5	µg/L	<0.5	----	<0.5	----	----
Cyfluthrin	68359-37-5	0.5	µg/L	<0.5	----	<0.5	----	----
Cypermethrin	52315-07-8	0.5	µg/L	<0.5	----	<0.5	----	----
Fenvalverate & Esfenvalerate	51630-58-1/66230-04-	0.5	µg/L	<0.5	----	<0.5	----	----
Deltamethrin & Tralomethrin	62229-77-0/66841-25-	0.5	µg/L	<0.5	----	<0.5	----	----
Allethrin	584-79-2	0.5	µg/L	<0.5	----	<0.5	----	----
Transfluthrin	118712-89-3	0.5	µg/L	<0.5	----	<0.5	----	----
Tau-fluvalinate	102851-06-9	0.5	µg/L	<0.5	----	<0.5	----	----
Tetramethrin	68085-85-8	0.5	µg/L	<0.5	----	<0.5	----	----
EP094B: Synergist								
Piperonyl Butoxide	63993-73-7	0.5	µg/L	<0.5	----	<0.5	----	----
EP117: Alcohols								
Ethanol	64-17-5	50	µg/L	<50	----	<50	----	----
Isopropanol	67-63-0	50	µg/L	**201**	----	**71**	----	----
n-Propanol	71-23-8	50	µg/L	<50	----	<50	----	----
Isobutanol	78-83-1	50	µg/L	<50	----	<50	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**INFLOW DAM 1 - FILTERED**	**INFLOW DAM 1 - TOTAL**	**POST DREDGING - FILTERED**	**POST DREDGING - TOTAL**	**----**
			Client sampling date / time	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	----
Compound	CAS Number	LOR	Unit	**ES1704754-001**	**ES1704754-002**	**ES1704754-003**	**ES1704754-004**	**--------**
				Result	Result	Result	Result	----
EP117: Alcohols - Continued								
n-Butanol	71-36-3	50	µg/L	<50	----	<50	----	----
EP125A: Monocyclic Aromatic Hydrocarbons								
Benzene	71-43-2	0.05	µg/L	<0.05	----	<0.05	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	----	<0.5	----	----
Ethylbenzene	100-41-4	0.05	µg/L	<0.05	----	<0.05	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.05	µg/L	<0.05	----	<0.05	----	----
Styrene	100-42-5	0.05	µg/L	<0.05	----	<0.05	----	----
ortho-Xylene	95-47-6	0.05	µg/L	<0.05	----	<0.05	----	----
1.3.5-Trimethylbenzene	108-67-8	0.05	µg/L	<0.05	----	<0.05	----	----
1.2.4-Trimethylbenzene	95-63-6	0.05	µg/L	<0.05	----	<0.05	----	----
EP125D: Fumigants								
1.2-Dichloropropane	78-87-5	0.1	µg/L	<0.1	----	<0.1	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.1	µg/L	<0.1	----	<0.1	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.1	µg/L	<0.1	----	<0.1	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.1	µg/L	<0.1	----	<0.1	----	----
EP125E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	0.5	µg/L	<0.5	----	<0.5	----	----
Vinyl chloride	75-01-4	0.3	µg/L	<0.3	----	<0.3	----	----
Bromomethane	74-83-9	0.5	µg/L	<0.5	----	<0.5	----	----
Chloroethane	75-00-3	0.5	µg/L	<0.5	----	<0.5	----	----
Trichlorofluoromethane	75-69-4	0.5	µg/L	<0.5	----	<0.5	----	----
1.1-Dichloroethene	75-35-4	0.1	µg/L	<0.1	----	<0.1	----	----
Dichloromethane	75-09-2	1	µg/L	**3.8**	----	**1.4**	----	----
trans-1.2-Dichloroethene	156-60-5	0.1	µg/L	<0.1	----	<0.1	----	----
1.1-Dichloroethane	75-34-3	0.1	µg/L	<0.1	----	<0.1	----	----
cis-1.2-Dichloroethene	156-59-2	0.1	µg/L	<0.1	----	<0.1	----	----
Bromochloromethane	74-97-5	0.5	µg/L	<0.5	----	<0.5	----	----
1.2-Dichloroethane	107-06-2	0.1	µg/L	**0.2**	----	**0.2**	----	----
1.1.1-Trichloroethane	71-55-6	0.1	µg/L	<0.1	----	<0.1	----	----
Carbon Tetrachloride	56-23-5	0.05	µg/L	<0.05	----	<0.05	----	----
Trichloroethene	79-01-6	0.05	µg/L	**0.06**	----	**0.09**	----	----
Tetrachloroethene	127-18-4	0.05	µg/L	<0.05	----	<0.05	----	----
Hexachlorobutadiene	87-68-3	0.04	µg/L	<0.04	----	<0.04	----	----
EP125F: Halogenated Aromatic Compounds								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**INFLOW DAM 1 - FILTERED**	**INFLOW DAM 1 - TOTAL**	**POST DREDGING - FILTERED**	**POST DREDGING - TOTAL**	**----**
			Client sampling date / time	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704754-001**	**ES1704754-002**	**ES1704754-003**	**ES1704754-004**	**--------**
				Result	Result	Result	Result	----
EP125F: Halogenated Aromatic Compounds - Continued								
Chlorobenzene	108-90-7	0.1	µg/L	**0.15**	----	**0.22**	----	----
Bromobenzene	108-86-1	0.1	µg/L	<0.10	----	<0.10	----	----
Benzylchloride	100-44-7	0.2	µg/L	<0.2	----	<0.2	----	----
1.3-Dichlorobenzene	541-73-1	0.1	µg/L	<0.10	----	<0.10	----	----
1.4-Dichlorobenzene	106-46-7	0.1	µg/L	<0.10	----	<0.10	----	----
1.2-Dichlorobenzene	95-50-1	0.1	µg/L	<0.10	----	<0.10	----	----
2-Chlorotoluene	95-49-8	0.1	µg/L	<0.1	----	<0.1	----	----
4-Chlorotoluene	106-43-4	0.1	µg/L	<0.1	----	<0.1	----	----
1.2.4-Trichlorobenzene	120-82-1	0.1	µg/L	<0.1	----	<0.1	----	----
1.2.3-Trichlorobenzene	87-61-6	0.1	µg/L	<0.1	----	<0.1	----	----
^ **Trichlorobenzenes (Sum)**	----	0.1	µg/L	<0.1	----	<0.1	----	----
EP125G: Trihalomethanes								
Chloroform	67-66-3	0.1	µg/L	**0.16**	----	**0.17**	----	----
Bromodichloromethane	75-27-4	0.1	µg/L	<0.10	----	<0.10	----	----
Dibromochloromethane	124-48-1	0.1	µg/L	<0.10	----	<0.10	----	----
Bromoform	75-25-2	0.1	µg/L	<0.10	----	<0.10	----	----
^ **Total Trihalomethanes**	----	0.1	µg/L	**0.16**	----	**0.17**	----	----
EP125H: Naphthalene								
Naphthalene	91-20-3	0.05	µg/L	<0.05	----	<0.05	----	----
EP125L: Methyl t-butyl ether								
Methyl tert-butyl ether (MTBE)	1634-04-4	0.1	µg/L	<0.1	----	<0.1	----	----
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.01	µg/L	<0.010	----	<0.010	----	----
alpha-BHC	319-84-6	0.01	µg/L	<0.010	----	<0.010	----	----
beta-BHC	319-85-7	0.01	µg/L	<0.010	----	<0.010	----	----
delta-BHC	319-86-8	0.01	µg/L	<0.010	----	<0.010	----	----
4.4`-DDD	72-54-8	0.01	µg/L	<0.010	----	<0.010	----	----
4.4`-DDE	72-55-9	0.01	µg/L	<0.010	----	<0.010	----	----
4.4`-DDT	50-29-3	0.01	µg/L	<0.010	----	<0.010	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.01	µg/L	<0.010	----	<0.010	----	----
Dieldrin	60-57-1	0.01	µg/L	<0.010	----	<0.010	----	----
alpha-Endosulfan	959-98-8	0.01	µg/L	<0.010	----	<0.010	----	----
beta-Endosulfan	33213-65-9	0.01	µg/L	<0.010	----	<0.010	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**INFLOW DAM 1 - FILTERED**	**INFLOW DAM 1 - TOTAL**	**POST DREDGING - FILTERED**	**POST DREDGING - TOTAL**	----
			Client sampling date / time	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	----
Compound	CAS Number	LOR	Unit	**ES1704754-001**	**ES1704754-002**	**ES1704754-003**	**ES1704754-004**	--------
				Result	Result	Result	Result	----
EP131A: Organochlorine Pesticides - Continued								
Endosulfan sulfate	1031-07-8	0.01	µg/L	<0.010	----	<0.010	----	----
^ **Endosulfan (sum)**	115-29-7	0.01	µg/L	<0.010	----	<0.010	----	----
Endrin	72-20-8	0.01	µg/L	<0.010	----	<0.010	----	----
Endrin aldehyde	7421-93-4	0.01	µg/L	<0.010	----	<0.010	----	----
Endrin ketone	53494-70-5	0.01	µg/L	<0.010	----	<0.010	----	----
Heptachlor	76-44-8	0.005	µg/L	<0.005	----	<0.005	----	----
Heptachlor epoxide	1024-57-3	0.01	µg/L	<0.010	----	<0.010	----	----
Hexachlorobenzene (HCB)	118-74-1	0.01	µg/L	<0.010	----	<0.010	----	----
gamma-BHC	58-89-9	0.01	µg/L	<0.010	----	<0.010	----	----
Methoxychlor	72-43-5	0.01	µg/L	<0.010	----	<0.010	----	----
cis-Chlordane	5103-71-9	0.01	µg/L	<0.010	----	<0.010	----	----
trans-Chlordane	5103-74-2	0.01	µg/L	<0.010	----	<0.010	----	----
^ **Total Chlordane (sum)**	----	0.01	µg/L	<0.010	----	<0.010	----	----
Oxychlordane	27304-13-8	0.01	µg/L	<0.010	----	<0.010	----	----
EP131B: Polychlorinated Biphenyls (as Aroclors)								
Total Polychlorinated biphenyls	----	0.1	µg/L	<0.10	----	<0.10	----	----
Aroclor 1016	12674-11-2	0.1	µg/L	<0.10	----	<0.10	----	----
Aroclor 1221	11104-28-2	0.1	µg/L	<0.10	----	<0.10	----	----
Aroclor 1232	11141-16-5	0.1	µg/L	<0.10	----	<0.10	----	----
Aroclor 1242	53469-21-9	0.1	µg/L	<0.10	----	<0.10	----	----
Aroclor 1248	12672-29-6	0.1	µg/L	<0.10	----	<0.10	----	----
Aroclor 1254	11097-69-1	0.1	µg/L	<0.10	----	<0.10	----	----
Aroclor 1260	11096-82-5	0.1	µg/L	<0.10	----	<0.10	----	----
EP132C: Chlorinated Naphthalenes								
1-Chloronaphthalene	90-13-1	0.1	µg/L	<0.1	----	<0.1	----	----
2-Chloronaphthalene	91-58-7	0.1	µg/L	<0.1	----	<0.1	----	----
^ **Chloronaphthalenes (1- + 2-)**	----	0.1	µg/L	<0.1	----	<0.1	----	----
EP203A: Explosives								
HMX	2691-41-0	1	µg/L	<1.0	----	<1.0	----	----
RDX	----	1	µg/L	<1.0	----	<1.0	----	----
1.3.5-Trinitrobenzene	99-35-4	1	µg/L	<1.0	----	<1.0	----	----
1.3-Dinitrobenzene	99-65-0	1	µg/L	<1.0	----	<1.0	----	----
Tetryl	479-45-8	1	µg/L	<1.0	----	<1.0	----	----
2.4.6-TNT	118-96-7	1	µg/L	<1.0	----	<1.0	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**INFLOW DAM 1 - FILTERED**	**INFLOW DAM 1 - TOTAL**	**POST DREDGING - FILTERED**	**POST DREDGING - TOTAL**	**----**
			Client sampling date / time	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704754-001**	**ES1704754-002**	**ES1704754-003**	**ES1704754-004**	**--------**
				Result	Result	Result	Result	----
EP203A: Explosives - Continued								
4-Amino.2.6-DNT	19406-51-0	1	µg/L	<1.0	----	<1.0	----	----
2-Amino-4.6-DNT	35572-78-2	1	µg/L	<1.0	----	<1.0	----	----
4-& 2-AM-DNT(Isomeric Mixture)	----	1	µg/L	<1.0	----	<1.0	----	----
2.4-Dinitrotoluene	121-14-2	1	µg/L	<1.0	----	<1.0	----	----
2.6-Dinitrotoluene	606-20-2	1	µg/L	<1.0	----	<1.0	----	----
2.4-& 2.6-DNT(Isomeric Mixture)	51-28-5/606-20-2	1	µg/L	<1.0	----	<1.0	----	----
Nitrobenzene	98-95-3	1	µg/L	<1.0	----	<1.0	----	----
2-Nitrotoluene	88-72-2	1	µg/L	<1.0	----	<1.0	----	----
3-Nitrotoluene	99-08-1	1	µg/L	<1.0	----	<1.0	----	----
4-Nitrotoluene	99-99-0	1	µg/L	<1.0	----	<1.0	----	----
Nitroglycerine	55-63-0	5	µg/L	<5	----	<5	----	----
PETN	78-11-5	5	µg/L	<5	----	<5	----	----
EP234: Multiresidue Pesticides (ESI Positive)								
3-Hydroxy Carbofuran	16655-82-6	0.02	µg/L	<0.02	----	<0.02	----	----
Abamectin	71751-41-2	0.1	µg/L	<0.1	----	<0.1	----	----
Acephate	30560-19-1	0.5	µg/L	<0.5	----	<0.5	----	----
Alachlor	15972-60-8	0.1	µg/L	<0.1	----	<0.1	----	----
Aldicarb	116-06-3	0.05	µg/L	<0.05	----	<0.05	----	----
Ametryn	834-12-8	0.01	µg/L	<0.01	----	<0.01	----	----
Aminopyralid	150114-71-9	0.1	µg/L	<0.1	----	<0.1	----	----
Amitraz	33089-61-1	100	µg/L	<100	----	<100	----	----
Atrazine	1912-24-9	0.01	µg/L	<0.01	----	<0.01	----	----
Atrazine-desethyl	6190-65-4	0.1	µg/L	<0.1	----	<0.1	----	----
Atrazine-desisopropyl	1007-28-9	0.1	µg/L	<0.1	----	<0.1	----	----
Azinphos-ethyl	2642-71-9	0.02	µg/L	<0.02	----	<0.02	----	----
Azinphos-methyl	86-50-0	0.02	µg/L	<0.02	----	<0.02	----	----
Azoxystrobin	131860-33-8	0.1	µg/L	<0.1	----	<0.1	----	----
Bendiocarb	22781-23-3	0.1	µg/L	<0.10	----	<0.10	----	----
Benomyl	17804-35-2	0.01	µg/L	**0.83**	----	**0.42**	----	----
Bensulfuron methyl	83055-99-6	0.1	µg/L	<0.1	----	<0.1	----	----
Bensulide	741-58-2	0.1	µg/L	<0.1	----	<0.1	----	----
Boscalid	188425-85-6	0.1	µg/L	<0.1	----	<0.1	----	----
Bromacil	314-40-9	0.02	µg/L	**0.03**	----	<0.02	----	----
Bromophos-ethyl	4824-78-6	0.1	µg/L	<0.10	----	<0.10	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**INFLOW DAM 1 - FILTERED**	**INFLOW DAM 1 - TOTAL**	**POST DREDGING - FILTERED**	**POST DREDGING - TOTAL**	----
			Client sampling date / time	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704754-001**	**ES1704754-002**	**ES1704754-003**	**ES1704754-004**	--------
				Result	Result	Result	Result	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Butachlor	23184-66-9	0.1	µg/L	<0.1	----	<0.1	----	----
Carbaryl	63-25-2	0.01	µg/L	<0.01	----	<0.01	----	----
Carbendazim (Thiophanate methyl)	10605-21-7	0.1	µg/L	**1.8**	----	**1.1**	----	----
Carbofenothion	786-19-6	0.02	µg/L	<0.02	----	<0.02	----	----
Carbofuran	1563-66-2	0.01	µg/L	<0.01	----	<0.01	----	----
Carboxin	5234-68-4	0.1	µg/L	<0.1	----	<0.1	----	----
Carfentrazone-ethyl	128639-02-1	0.1	µg/L	<0.1	----	<0.1	----	----
Chlorantraniliprole	500008-45-7	0.1	µg/L	<0.1	----	<0.1	----	----
Chlorfenvinphos	470-90-6	0.02	µg/L	<0.02	----	<0.02	----	----
Chloroxuron	1982-47-4	0.1	µg/L	<0.1	----	<0.1	----	----
Chlorpyrifos	2921-88-2	0.02	µg/L	<0.02	----	<0.02	----	----
Chlorpyrifos-methyl	5598-13-0	0.1	µg/L	<0.2	----	<0.2	----	----
Chlorsulfuron	64902-72-3	0.2	µg/L	<0.2	----	<0.2	----	----
Coumaphos	56-72-4	0.01	µg/L	<0.01	----	<0.01	----	----
Cyanazine	21725-46-2	0.02	µg/L	<0.02	----	<0.02	----	----
Cyproconazole	94361-06-5	0.02	µg/L	<0.02	----	<0.02	----	----
Cyprodinil	121552-61-2	0.01	µg/L	<0.01	----	<0.01	----	----
Cyromazine	66215-27-8	0.05	µg/L	<0.05	----	<0.05	----	----
Demeton-O	298-03-0	0.02	µg/L	<0.02	----	<0.02	----	----
Demeton-O & Demeton-S	298-03-3/126-75-0	0.02	µg/L	<0.02	----	<0.02	----	----
Demeton-S	126-75-0	0.02	µg/L	<0.02	----	<0.02	----	----
Demeton-S-methyl	919-86-8	0.02	µg/L	<0.02	----	<0.02	----	----
Diazinon	333-41-5	0.01	µg/L	<0.01	----	<0.01	----	----
Dichlobenil	1194-65-6	0.1	µg/L	<0.1	----	<0.1	----	----
Dichlorvos	62-73-7	0.2	µg/L	<0.20	----	<0.20	----	----
Diclofop-methyl	51338-27-3	0.05	µg/L	<0.05	----	<0.05	----	----
Difenoconazole	119446-68-3	0.02	µg/L	<0.02	----	<0.02	----	----
Diflubenzuron	35367-38-5	0.1	µg/L	<0.1	----	<0.1	----	----
Dimethoate	60-51-5	0.02	µg/L	<0.02	----	<0.02	----	----
Diphenamid	957-51-7	0.1	µg/L	<0.1	----	<0.1	----	----
Disulfoton	298-04-4	0.05	µg/L	<0.05	----	<0.05	----	----
Diuron	330-54-1	0.02	µg/L	<0.02	----	<0.02	----	----
EPN	2104-64-5	0.05	µg/L	<0.05	----	<0.05	----	----

Analytical Results

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

			Client sample ID	**INFLOW DAM 1 - FILTERED**	**INFLOW DAM 1 - TOTAL**	**POST DREDGING - FILTERED**	**POST DREDGING - TOTAL**	----
			Client sampling date / time	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	----
Compound	CAS Number	LOR	Unit	**ES1704754-001**	**ES1704754-002**	**ES1704754-003**	**ES1704754-004**	--------
				Result	Result	Result	Result	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
EPTC	759-94-4	0.1	µg/L	<0.1	----	<0.1	----	----
Ethion	563-12-2	0.02	µg/L	<0.02	----	<0.02	----	----
Ethoprophos	13194-48-4	0.01	µg/L	<0.01	----	<0.01	----	----
Etridiazole	2593-15-9	0.5	µg/L	<0.5	----	<0.5	----	----
Fenamiphos	22224-92-6	0.01	µg/L	<0.01	----	<0.01	----	----
Fenarimol	60168-88-9	0.02	µg/L	<0.02	----	<0.02	----	----
Fenchlorphos (Ronnel)	299-84-3	10	µg/L	<10	----	<10	----	----
Fenitrothion	122-14-5	2	µg/L	<2	----	<2	----	----
Fenoxycarb	79127-80-3	0.1	µg/L	<0.1	----	<0.1	----	----
Fensulfothion	115-90-2	0.01	µg/L	<0.01	----	<0.01	----	----
Fenthion	55-38-9	0.05	µg/L	<0.05	----	<0.05	----	----
Flamprop methyl	52756-25-9	0.1	µg/L	<0.1	----	<0.1	----	----
Fluometuron	2164-17-2	0.01	µg/L	<0.01	----	<0.01	----	----
Flusilazole	85509-19-9	0.02	µg/L	<0.02	----	<0.02	----	----
Formothion	2540-82-1	20	µg/L	<20	----	<20	----	----
Fosetyl Aluminium	39148-24-8	10	µg/L	<10	----	<10	----	----
Haloxyfop	69806-34-4	0.1	µg/L	<0.1	----	<0.1	----	----
Hexaconazole	79983-71-4	0.02	µg/L	<0.02	----	<0.02	----	----
Hexazinone	51235-04-2	0.02	µg/L	<0.02	----	<0.02	----	----
Imazapyr	94795-74-1	10	µg/L	<10.0	----	<10.0	----	----
Indoxacarb	173584-44-6	0.1	µg/L	<0.1	----	<0.1	----	----
Iodosulfuron methyl	144550-36-7	0.1	µg/L	<0.1	----	<0.1	----	----
Irgarol	28159-98-0	0.002	µg/L	**0.004**	----	**0.002**	----	----
Isoproturon	34123-59-6	0.1	µg/L	<0.1	----	<0.1	----	----
Malathion	121-75-5	0.02	µg/L	<0.02	----	<0.02	----	----
Metalaxyl	57837-19-1	0.1	µg/L	<0.1	----	<0.1	----	----
Metalaxyl-M	70630-17-0	0.1	µg/L	<0.1	----	<0.1	----	----
Metaldehyde	108-62-3	10	µg/L	<10	----	<10	----	----
Methidathion	950-37-8	0.1	µg/L	<0.1	----	<0.1	----	----
Methiocarb	2032-65-7	0.01	µg/L	<0.01	----	<0.01	----	----
Methomyl	16752-77-5	0.01	µg/L	<0.01	----	<0.01	----	----
Metolachlor	51218-45-2	0.01	µg/L	<0.01	----	<0.01	----	----
Metribuzin	21087-64-9	0.02	µg/L	<0.02	----	<0.02	----	----
Mevinphos	7786-34-7	0.02	µg/L	<0.02	----	<0.02	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**INFLOW DAM 1 - FILTERED**	**INFLOW DAM 1 - TOTAL**	**POST DREDGING - FILTERED**	**POST DREDGING - TOTAL**	**----**
			Client sampling date / time	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704754-001**	**ES1704754-002**	**ES1704754-003**	**ES1704754-004**	**--------**
				Result	Result	Result	Result	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Molinate	2212-67-1	0.1	µg/L	<0.1	----	<0.1	----	----
Monocrotophos	6923-22-4	0.02	µg/L	<0.02	----	<0.02	----	----
Myclobutanil	88671-89-0	0.1	µg/L	<0.1	----	<0.1	----	----
Naftalofos	1491-41-4	1	µg/L	<1.0	----	<1.0	----	----
Napropamide	15299-99-7	0.1	µg/L	<0.1	----	<0.1	----	----
Nitralin	4726-14-1	0.1	µg/L	<0.1	----	<0.1	----	----
Norflurazon	27314-13-2	0.1	µg/L	<0.1	----	<0.1	----	----
Novaluron	116714-46-6	0.1	µg/L	<0.1	----	<0.1	----	----
Omethoate	1113-02-6	0.01	µg/L	<0.01	----	<0.01	----	----
Oxamyl	23135-22-0	0.01	µg/L	<0.01	----	<0.01	----	----
Oxyfluorfen	42874-03-3	1	µg/L	<1.0	----	<1.0	----	----
Paclobutrazole	76738-62-0	0.05	µg/L	<0.05	----	<0.05	----	----
Parathion	56-38-2	0.2	µg/L	<0.2	----	<0.2	----	----
Parathion-methyl	298-00-0	0.5	µg/L	<0.5	----	<0.5	----	----
Pebulate	1114-71-2	0.1	µg/L	<0.1	----	<0.1	----	----
Penconazole	66246-88-6	0.01	µg/L	<0.01	----	<0.01	----	----
Pendimethalin	40487-42-1	0.05	µg/L	<0.05	----	<0.05	----	----
Phorate	298-02-2	0.1	µg/L	<0.1	----	<0.1	----	----
Pirimicarb	23103-98-2	0.1	µg/L	<0.1	----	<0.1	----	----
Pirimiphos-ethyl	23505-41-1	0.01	µg/L	<0.01	----	<0.01	----	----
Pirimiphos-methyl	29232-93-7	0.01	µg/L	<0.01	----	<0.01	----	----
Prochloraz	67747-09-5	0.1	µg/L	<0.1	----	<0.1	----	----
Profenofos	41198-08-7	0.01	µg/L	<0.01	----	<0.01	----	----
Promecarb	2631-37-0	0.1	µg/L	<0.1	----	<0.1	----	----
Prometryn	7287-19-6	0.01	µg/L	<0.01	----	<0.01	----	----
Propachlor	1918-16-7	0.1	µg/L	<0.1	----	<0.1	----	----
Propamocarb	24579-73-5	0.1	µg/L	<0.1	----	<0.1	----	----
Propargite	2312-35-8	0.1	µg/L	<0.1	----	<0.1	----	----
Propazine	139-40-2	0.01	µg/L	<0.01	----	<0.01	----	----
Propiconazole	60207-90-1	0.05	µg/L	<0.05	----	<0.05	----	----
Propyzamide	23950-58-5	0.1	µg/L	<0.1	----	<0.1	----	----
Prothiofos	34643-46-4	0.1	µg/L	<0.1	----	<0.1	----	----
Pyraclostrobin	175013-18-0	0.1	µg/L	<0.1	----	<0.1	----	----
Pyrazophos	13457-18-6	0.1	µg/L	<0.1	----	<0.1	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	INFLOW DAM 1 - FILTERED	INFLOW DAM 1 - TOTAL	POST DREDGING - FILTERED	POST DREDGING - TOTAL	----
			Client sampling date / time	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	----
Compound	CAS Number	LOR	Unit	ES1704754-001	ES1704754-002	ES1704754-003	ES1704754-004	--------
				Result	Result	Result	Result	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Pyrimethanil	53112-28-0	0.02	µg/L	<0.02	----	<0.02	----	----
Pyriproxyfen	95737-68-1	0.1	µg/L	<0.1	----	<0.1	----	----
Pyroxsulam	422556-08-9	0.1	µg/L	<0.1	----	<0.1	----	----
Quinclorac	84087-01-4	0.1	µg/L	<0.1	----	<0.1	----	----
Rimsulfuron	122931-48-0	0.1	µg/L	<0.1	----	<0.1	----	----
Siduron	1982-49-6	0.1	µg/L	<0.1	----	<0.1	----	----
Simazine	122-34-9	0.02	µg/L	**0.04**	----	**0.02**	----	----
Spirotetramat	203313-25-1	0.1	µg/L	<0.1	----	<0.1	----	----
Sulfotep	3689-24-5	0.005	µg/L	<0.005	----	<0.005	----	----
Sulprofos	35400-43-2	0.05	µg/L	<0.05	----	<0.05	----	----
Tebuconazole	107534-96-3	0.01	µg/L	<0.01	----	<0.01	----	----
Tebuthiuron	34014-18-1	0.02	µg/L	<0.02	----	<0.02	----	----
Temephos	3383-96-8	0.02	µg/L	<0.02	----	<0.02	----	----
Terbacil	5902-51-2	0.1	µg/L	<0.1	----	<0.1	----	----
Terbufos	13071-79-9	0.01	µg/L	<0.01	----	<0.01	----	----
Terbuthylazine	5915-41-3	0.01	µg/L	<0.01	----	<0.01	----	----
Terbutryn	886-50-0	0.01	µg/L	<0.01	----	<0.01	----	----
Tetrachlorvinphos	22248-79-9	0.01	µg/L	<0.01	----	<0.01	----	----
Tetraconazole	112281-77-3	0.1	µg/L	<0.1	----	<0.1	----	----
Thiamethoxam	153719-23-4	0.02	µg/L	<0.02	----	<0.02	----	----
Thiobencarb	28249-77-6	0.01	µg/L	<0.01	----	<0.01	----	----
Thiodicarb	59669-26-0	0.01	µg/L	<0.01	----	<0.01	----	----
Thiometon	640-15-3	0.5	µg/L	<0.5	----	<0.5	----	----
Toltrazuril	69004-03-1	0.5	µg/L	<0.5	----	<0.5	----	----
Triadimefon	43121-43-3	0.1	µg/L	<0.1	----	<0.1	----	----
Triadimenol	55219-65-3	0.1	µg/L	<0.1	----	<0.1	----	----
Triazophos	24017-47-8	0.005	µg/L	<0.005	----	<0.005	----	----
Trichlorfon	52-68-6	0.02	µg/L	<0.02	----	<0.02	----	----
Trichloronate	327-98-0	0.5	µg/L	<0.5	----	<0.5	----	----
Trifloxystrobin	141517-21-7	0.1	µg/L	<0.1	----	<0.1	----	----
Trifloxysulfuron-sodium	199119-58-9	0.1	µg/L	<0.1	----	<0.1	----	----
Trifluralin	1582-09-8	10	µg/L	<10.0	----	<10.0	----	----
Trinexapac Ethyl	95266-40-3	1	µg/L	<1	----	<1	----	----
Vernolate	1929-77-7	0.1	µg/L	<0.1	----	<0.1	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**INFLOW DAM 1 - FILTERED**	**INFLOW DAM 1 - TOTAL**	**POST DREDGING - FILTERED**	**POST DREDGING - TOTAL**	----
			Client sampling date / time	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704754-001**	**ES1704754-002**	**ES1704754-003**	**ES1704754-004**	**--------**
				Result	Result	Result	Result	----
EP247: Phenolics and Related Compounds								
2,4-Dinitrophenol	51-28-5	0.01	µg/L	<0.01	----	<0.01	----	----
2-Methyl-4.6-dinitrophenol	8071-51-0	0.05	µg/L	<0.05	----	<0.05	----	----
4-Nonylphenol (mixture of isomers)	84852-15-3	0.1	µg/L	<0.10	----	<0.10	----	----
Hexachlorophene	70-30-4	0.1	µg/L	<0.10	----	<0.10	----	----
4-Nitrophenol	100-02-7	0.1	µg/L	**0.13**	----	**0.30**	----	----
4-Chloro-3-methylphenol	59-50-7	0.1	µg/L	<0.10	----	<0.10	----	----
Pentachlorophenol	87-86-5	0.1	µg/L	<0.10	----	<0.10	----	----
Dinoseb	88-85-7	0.1	µg/L	<0.10	----	<0.10	----	----
Dalapon	75-99-0	0.1	µg/L	<0.10	----	<0.10	----	----
Bisphenol-A	80-05-7	0.05	µg/L	**0.22**	----	**1.53**	----	----
MW002: Heterotrophic Plate Count								
Heterotrophic Plate Count (22°C)	----	1	CFU/mL	----	**~16000**	----	**~51000**	----
MW006: Faecal Coliforms & E.coli by MF								
Escherichia coli	----	1	CFU/100mL	----	<2	----	**19**	----
MW007: Coliforms by MF								
Coliforms	----	1	CFU/100mL	----	<2	----	**140**	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	**27.3**	----	**24.7**	----	----
2-Chlorophenol-D4	93951-73-6	1	%	**38.0**	----	**49.6**	----	----
2.4.6-Tribromophenol	118-79-6	1	%	**36.3**	----	**41.9**	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	**89.9**	----	**77.2**	----	----
Anthracene-d10	1719-06-8	1	%	**79.6**	----	**87.5**	----	----
4-Terphenyl-d14	1718-51-0	1	%	**80.7**	----	**88.5**	----	----
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	2	%	**25.8**	----	**14.0**	----	----
Phenol-d6	13127-88-3	2	%	**30.4**	----	**31.2**	----	----
2-Chlorophenol-D4	93951-73-6	2	%	**21.6**	----	**32.2**	----	----
2.4.6-Tribromophenol	118-79-6	2	%	**16.5**	----	**28.0**	----	----
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	2	%	**54.6**	----	**65.0**	----	----
1.2-Dichlorobenzene-D4	2199-69-1	2	%	**43.3**	----	**53.3**	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**INFLOW DAM 1 - FILTERED**	**INFLOW DAM 1 - TOTAL**	**POST DREDGING - FILTERED**	**POST DREDGING - TOTAL**	**----**
			Client sampling date / time	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	[01-Mar-2017]	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704754-001**	**ES1704754-002**	**ES1704754-003**	**ES1704754-004**	**--------**
				Result	Result	Result	Result	----
EP075T: Base/Neutral Extractable Surrogates - Continued								
2-Fluorobiphenyl	321-60-8	2	%	**64.7**	**----**	**80.0**	**----**	**----**
Anthracene-d10	1719-06-8	2	%	**79.6**	**----**	**110**	**----**	**----**
4-Terphenyl-d14	1718-51-0	2	%	**78.8**	**----**	**109**	**----**	**----**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**113**	**----**	**112**	**----**	**----**
Toluene-D8	2037-26-5	2	%	**111**	**----**	**107**	**----**	**----**
4-Bromofluorobenzene	460-00-4	2	%	**105**	**----**	**105**	**----**	**----**
EP094S: Pesticide Surrogate								
DEF	78-48-8	0.5	%	**103**	**----**	**105**	**----**	**----**
EP125S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**111**	**----**	**114**	**----**	**----**
Toluene-D8	2037-26-5	0.1	%	**107**	**----**	**110**	**----**	**----**
4-Bromofluorobenzene	460-00-4	0.1	%	**105**	**----**	**109**	**----**	**----**
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.01	%	**95.8**	**----**	**95.7**	**----**	**----**
EP131T: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	**96.6**	**----**	**97.6**	**----**	**----**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**71.8**	**----**	**57.6**	**----**	**----**
Anthracene-d10	1719-06-8	0.1	%	**105**	**----**	**110**	**----**	**----**
4-Terphenyl-d14	1718-51-0	0.1	%	**123**	**----**	**124**	**----**	**----**
EP203S: Explosives Surrogate								
o-Dinitrobenzene	528-29-0	1	%	**91.1**	**----**	**75.9**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	*CAS Number*	*Recovery Limits (%)* Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	10	117
Phenol-d6	13127-88-3	10	69
2-Chlorophenol-D4	93951-73-6	21	130
2.4.6-Tribromophenol	118-79-6	10	151
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	29	142
1.2-Dichlorobenzene-D4	2199-69-1	24	121
2-Fluorobiphenyl	321-60-8	27	135
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	21	123
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128
EP094S: Pesticide Surrogate			
DEF	78-48-8	42	143
EP125S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	65	127
4-Bromofluorobenzene	460-00-4	68	124
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	14	166
EP131T: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	10	144
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	135
Anthracene-d10	1719-06-8	48	138
4-Terphenyl-d14	1718-51-0	48	144
EP203S: Explosives Surrogate			

Sub-Matrix: **WATER**

		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP203S: Explosives Surrogate - Continued			
o-Dinitrobenzene	528-29-0	51	125

CERTIFICATE OF ANALYSIS

Work Order : **ES1704950**
Client : **BORAL RECYCLING - WIDEMERE**
Contact : PHILIP PATERSON
Address : Boral Recycling
Wetherill Park, NSW 2164
Telephone : 02 9604 9101
Project : SURFACE WATER ANALYSIS
Order number : tba
C-O-C number : ----
Sampler : CHRIS V.
Site : ----
Quote number : SY/662/16 V4
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 20
Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 02-Mar-2017 13:55
Date Analysis Commenced : 02-Mar-2017
Issue Date : 16-Mar-2017 14:43

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This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Amanda Conkie	Organic Chemist	Brisbane Organics, Stafford, QLD
Ashesh Patel	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Dian Dao		Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Raymond Commodore	Instrument Chemist	Sydney Inorganics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW
Vyoma Tailor	Microbiologist	Sydney Microbiology, Smithfield, NSW

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
~ = Indicates an estimated value.

- EG093: Sample ES1704950 #001 was run on EG094 method due to low TDS content.
- EP247: Poor matrix spike recovery due to matrix interferences(confirmed by re-analysis).
- EP234 : Poor matrix spike recovery due to matrix interferences(confirmed by re-analysis).
- CFU = colony forming unit
- MF = membrane filtration
- Microbiological Comment: HPC results are reported an approximate (~) when the count of colonies on the plate is outside the range of 10 - 300cfu, in accordance with ALS work instruction QWI-MIC/MW002.
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
-
- EP050: The MBAS reported is calculated as LAS, mol wt ____342___.
- According to ALS work instruction for membrane filtration, the suggested volume for filtration of non treated / non-drinking water starts from 10mL or 50mL if the sample is turbid. A result of <10 or <2cfu/100mL is reported when there is no target organism growth from a volume of 10 or 50mL respectively.
- HPC results are reported as an estimate (~) when the count of colonies on the plate is outside the range of 10 - 300cfu, in accordance with ALS work instruction QWI-MIC/MW002, or 25-250 cfu for MW003.
- Total PAH reported as the sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene and Benzo(g,h,i)perylene.
- EP075: 'Sum of PAH' is the sum of the USEPA 16 priority PAHs
- MW002 is ALS's internal code and is equivalent to AS4276.3.1.
- MW006 is ALS's internal code and is equivalent to AS4276.7.
- MW007 is ALS's internal code and is equivalent to AS4276.5.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**WATER DISCHARGE DAM 2 - FILTERED**	**WATER DISCHARGE DAM 2 - TOTAL**	**----**	**----**	**----**
			Client sampling date / time	[02-Mar-2017]	[02-Mar-2017]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704950-001**	**ES1704950-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**10.6**	**10.2**	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**443**	**334**	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	<5	**147**	----	----	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	**0.2**	**111**	----	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	**57**	----	----	----	----
EA075: Redox Potential								
Redox Potential	----	0.1	mV	**46.0**	----	----	----	----
pH Redox	----	0.01	pH Unit	**10.9**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**48**	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**30**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**23**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	<1	----	----	----	----
Sodium	7440-23-5	1	mg/L	**43**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**27**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Gallium	7440-55-3	0.001	mg/L	**0.003**	----	----	----	----
Lanthanum	7439-91-0	0.001	mg/L	<0.001	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.00004	mg/L	<0.00004	----	----	----	----
EG049G LL-F: Dissolved Trivalent Chromium - Low Level								
Trivalent Chromium	16065-83-1	0.001	mg/L	<0.001	----	----	----	----
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level								
Hexavalent Chromium	18540-29-9	0.001	mg/L	**0.017**	----	----	----	----
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	**11.1**	----	----	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**WATER DISCHARGE DAM 2 - FILTERED**	**WATER DISCHARGE DAM 2 - TOTAL**	**----**	**----**	**----**
			Client sampling date / time	[02-Mar-2017]	[02-Mar-2017]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704950-001**	**ES1704950-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS - Continued								
Aluminium	7429-90-5	5	µg/L	**1520**	----	----	----	----
Antimony	7440-36-0	0.5	µg/L	**1.4**	----	----	----	----
Arsenic	7440-38-2	0.5	µg/L	**1.1**	----	----	----	----
Barium	7440-39-3	1	µg/L	**11**	----	----	----	----
Beryllium	7440-41-7	0.1	µg/L	<0.1	----	----	----	----
Bismuth	7440-69-9	0.1	µg/L	<0.1	----	----	----	----
Boron	7440-42-8	100	µg/L	<100	----	----	----	----
Cadmium	7440-43-9	0.2	µg/L	<0.2	----	----	----	----
Chromium	7440-47-3	0.5	µg/L	**16.0**	----	----	----	----
Cobalt	7440-48-4	0.2	µg/L	**0.8**	----	----	----	----
Copper	7440-50-8	1	µg/L	**23**	----	----	----	----
Iron	7439-89-6	5	µg/L	**14**	----	----	----	----
Lead	7439-92-1	0.2	µg/L	<0.2	----	----	----	----
Manganese	7439-96-5	0.5	µg/L	<0.5	----	----	----	----
Molybdenum	7439-98-7	0.1	µg/L	**11.4**	----	----	----	----
Nickel	7440-02-0	0.5	µg/L	**1.6**	----	----	----	----
Selenium	7782-49-2	2	µg/L	<2	----	----	----	----
Silver	7440-22-4	0.1	µg/L	<0.1	----	----	----	----
Strontium	7440-24-6	10	µg/L	**126**	----	----	----	----
Thallium	7440-28-0	0.1	µg/L	<0.1	----	----	----	----
Tin	7440-31-5	5	µg/L	<5	----	----	----	----
Uranium	7440-61-1	0.1	µg/L	<0.1	----	----	----	----
Vanadium	7440-62-2	0.5	µg/L	**30.9**	----	----	----	----
Zinc	7440-66-6	5	µg/L	<5	----	----	----	----
EK010-1: Chlorine								
Total Residual Chlorine	----	0.02	mg/L	<0.02	----	----	----	----
EK025SF: Free CN by Segmented Flow Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	----	----	----	----
EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser								
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	----	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.3**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**WATER DISCHARGE DAM 2 - FILTERED**	**WATER DISCHARGE DAM 2 - TOTAL**	**----**	**----**	**----**
			Client sampling date / time	[02-Mar-2017]	[02-Mar-2017]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704950-001**	**ES1704950-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EK084: Un-ionized Hydrogen Sulfide								
Unionized Hydrogen Sulfide	----	0.1	mg/L	<0.1	----	----	----	----
EK255A: Ammonia								
Ammonia as N	7664-41-7	0.005	mg/L	**0.139**	----	----	----	----
EK257A: Nitrite								
Nitrite as N	14797-65-0	0.002	mg/L	**0.755**	----	----	----	----
EK258A: Nitrate								
Nitrate as N	14797-55-8	0.002	mg/L	**2.34**	----	----	----	----
EK259A: Nitrite and Nitrate (NOx)								
Nitrite + Nitrate as N	----	0.002	mg/L	**3.10**	----	----	----	----
EK261A: Total Kjeldahl Nitrogen								
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	**0.91**	----	----	----	----
EK262A: Total Nitrogen								
Total Nitrogen as N	----	0.01	mg/L	**4.01**	----	----	----	----
EK267A: Total Phosphorus (Persulfate Digestion)								
Total Phosphorus as P	----	0.005	mg/L	**0.068**	----	----	----	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	<1	----	----	----	----
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	<1	----	----	----	----
EP020: Oil and Grease (O&G)								
Oil & Grease	----	5	mg/L	----	<5	----	----	----
EP026SPF: Chemical Oxygen Demand (Spectrophotometric); Filtered								
Chemical Oxygen Demand - Filtered	----	10	mg/L	**19**	----	----	----	----
EP030F: Biochemical Oxygen Demand (Filtered)								
Biochemical Oxygen Demand (Filtered)	----	2	mg/L	<2	----	----	----	----
EP050: Anionic Surfactants as MBAS								
Anionic Surfactants as MBAS	----	0.1	mg/L	**0.4**	----	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1	µg/L	<1.0	----	----	----	----
2-Chlorophenol	95-57-8	1	µg/L	<1.0	----	----	----	----
2-Methylphenol	95-48-7	1	µg/L	<1.0	----	----	----	----
3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	----	----	----	----
2-Nitrophenol	88-75-5	1	µg/L	<1.0	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**WATER DISCHARGE DAM 2 - FILTERED**	**WATER DISCHARGE DAM 2 - TOTAL**	----	----	----
			Client sampling date / time	[02-Mar-2017]	[02-Mar-2017]	----	----	----
Compound	CAS Number	LOR	Unit	**ES1704950-001**	**ES1704950-002**	--------	--------	--------
				Result	Result	----	----	----
EP075(SIM)A: Phenolic Compounds - Continued								
2.4-Dimethylphenol	105-67-9	1	µg/L	<1.0	----	----	----	----
2.4-Dichlorophenol	120-83-2	1	µg/L	<1.0	----	----	----	----
2.6-Dichlorophenol	87-65-0	1	µg/L	<1.0	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	1	µg/L	<1.0	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	1	µg/L	<1.0	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	1	µg/L	<1.0	----	----	----	----
Pentachlorophenol	87-86-5	2	µg/L	<2.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	----	----	----	----
EP075C: Phthalate Esters								
Dimethyl phthalate	131-11-3	2	µg/L	<2	----	----	----	----
Diethyl phthalate	84-66-2	2	µg/L	<2	----	----	----	----
Di-n-butyl phthalate	84-74-2	2	µg/L	<2	----	----	----	----
Butyl benzyl phthalate	85-68-7	2	µg/L	<2	----	----	----	----
bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L	<10	----	----	----	----
Di-n-octylphthalate	117-84-0	2	µg/L	<2	----	----	----	----
EP075G: Chlorinated Hydrocarbons								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**WATER DISCHARGE DAM 2 - FILTERED**	**WATER DISCHARGE DAM 2 - TOTAL**	----	----	----
			Client sampling date / time	[02-Mar-2017]	[02-Mar-2017]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704950-001**	**ES1704950-002**	--------	--------	--------
				Result	Result	----	----	----
EP075G: Chlorinated Hydrocarbons - Continued								
1.3-Dichlorobenzene	541-73-1	2	µg/L	<2	----	----	----	----
1.4-Dichlorobenzene	106-46-7	2	µg/L	<2	----	----	----	----
1.2-Dichlorobenzene	95-50-1	2	µg/L	<2	----	----	----	----
Hexachloroethane	67-72-1	2	µg/L	<2	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	2	µg/L	<2	----	----	----	----
Hexachloropropylene	1888-71-7	2	µg/L	<2	----	----	----	----
Hexachlorobutadiene	87-68-3	2	µg/L	<2	----	----	----	----
Hexachlorocyclopentadiene	77-47-4	10	µg/L	<10	----	----	----	----
Pentachlorobenzene	608-93-5	2	µg/L	<2	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	4	µg/L	<4	----	----	----	----
EP075H: Anilines and Benzidines								
Aniline	62-53-3	2	µg/L	<2	----	----	----	----
4-Chloroaniline	106-47-8	2	µg/L	<2	----	----	----	----
2-Nitroaniline	88-74-4	4	µg/L	<4	----	----	----	----
3-Nitroaniline	99-09-2	4	µg/L	<4	----	----	----	----
Dibenzofuran	132-64-9	2	µg/L	<2	----	----	----	----
4-Nitroaniline	100-01-6	2	µg/L	<2	----	----	----	----
Carbazole	86-74-8	2	µg/L	<2	----	----	----	----
3.3`-Dichlorobenzidine	91-94-1	2	µg/L	<2	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)	Client sample ID			**WATER DISCHARGE DAM 2 - FILTERED**	**WATER DISCHARGE DAM 2 - TOTAL**	----	----	----
	Client sampling date / time			[02-Mar-2017]	[02-Mar-2017]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704950-001**	**ES1704950-002**	--------	--------	--------
				Result	Result	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued								
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ **Total Xylenes**	1330-20-7	2	µg/L	<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP094A: Synthetic Pyrethroids								
Bioresmethrin	28434-01-07	0.5	µg/L	<0.5	----	----	----	----
Bifenthrin	82657-04-3	0.5	µg/L	<0.5	----	----	----	----
Phenothrin	26002-80-2	0.5	µg/L	<0.5	----	----	----	----
Lambda-cyhalothrin	68085-85-8	0.5	µg/L	<0.5	----	----	----	----
Permethrin	52645-53-1	0.5	µg/L	<0.5	----	----	----	----
Cyfluthrin	68359-37-5	0.5	µg/L	<0.5	----	----	----	----
Cypermethrin	52315-07-8	0.5	µg/L	<0.5	----	----	----	----
Fenvalverate & Esfenvalerate	51630-58-1/66230-04-	0.5	µg/L	<0.5	----	----	----	----
Deltamethrin & Tralomethrin	62229-77-0/66841-25-	0.5	µg/L	<0.5	----	----	----	----
Allethrin	584-79-2	0.5	µg/L	<0.5	----	----	----	----
Transfluthrin	118712-89-3	0.5	µg/L	<0.5	----	----	----	----
Tau-fluvalinate	102851-06-9	0.5	µg/L	<0.5	----	----	----	----
Tetramethrin	68085-85-8	0.5	µg/L	<0.5	----	----	----	----
EP094B: Synergist								
Piperonyl Butoxide	63993-73-7	0.5	µg/L	<0.5	----	----	----	----
EP117: Alcohols								
Ethanol	64-17-5	50	µg/L	**410**	----	----	----	----
Isopropanol	67-63-0	50	µg/L	**650**	----	----	----	----
n-Propanol	71-23-8	50	µg/L	<50	----	----	----	----
Isobutanol	78-83-1	50	µg/L	<50	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**WATER DISCHARGE DAM 2 - FILTERED**	**WATER DISCHARGE DAM 2 - TOTAL**	----	----	----
			Client sampling date / time	[02-Mar-2017]	[02-Mar-2017]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704950-001**	**ES1704950-002**	--------	--------	--------
				Result	Result	----	----	----
EP117: Alcohols - Continued								
n-Butanol	71-36-3	50	µg/L	<50	----	----	----	----
EP125A: Monocyclic Aromatic Hydrocarbons								
Benzene	71-43-2	0.05	µg/L	<0.05	----	----	----	----
Toluene	108-88-3	0.5	µg/L	**0.9**	----	----	----	----
Ethylbenzene	100-41-4	0.05	µg/L	**0.07**	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.05	µg/L	**0.29**	----	----	----	----
Styrene	100-42-5	0.05	µg/L	<0.05	----	----	----	----
ortho-Xylene	95-47-6	0.05	µg/L	**0.22**	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	0.05	µg/L	<0.05	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	0.05	µg/L	<0.05	----	----	----	----
EP125D: Fumigants								
1.2-Dichloropropane	78-87-5	0.1	µg/L	<0.1	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.1	µg/L	<0.1	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.1	µg/L	<0.1	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.1	µg/L	<0.1	----	----	----	----
EP125E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	0.5	µg/L	<0.5	----	----	----	----
Vinyl chloride	75-01-4	0.3	µg/L	<0.3	----	----	----	----
Bromomethane	74-83-9	0.5	µg/L	<0.5	----	----	----	----
Chloroethane	75-00-3	0.5	µg/L	<0.5	----	----	----	----
Trichlorofluoromethane	75-69-4	0.5	µg/L	<0.5	----	----	----	----
1.1-Dichloroethene	75-35-4	0.1	µg/L	<0.1	----	----	----	----
Dichloromethane	75-09-2	1	µg/L	**2.5**	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	0.1	µg/L	<0.1	----	----	----	----
1.1-Dichloroethane	75-34-3	0.1	µg/L	<0.1	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	0.1	µg/L	<0.1	----	----	----	----
Bromochloromethane	74-97-5	0.5	µg/L	<0.5	----	----	----	----
1.2-Dichloroethane	107-06-2	0.1	µg/L	**0.1**	----	----	----	----
1.1.1-Trichloroethane	71-55-6	0.1	µg/L	<0.1	----	----	----	----
Carbon Tetrachloride	56-23-5	0.05	µg/L	<0.05	----	----	----	----
Trichloroethene	79-01-6	0.05	µg/L	<0.05	----	----	----	----
Tetrachloroethene	127-18-4	0.05	µg/L	<0.05	----	----	----	----
Hexachlorobutadiene	87-68-3	0.04	µg/L	<0.04	----	----	----	----
EP125F: Halogenated Aromatic Compounds								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**WATER DISCHARGE DAM 2 - FILTERED**	**WATER DISCHARGE DAM 2 - TOTAL**	----	----	----
			Client sampling date / time	[02-Mar-2017]	[02-Mar-2017]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704950-001**	**ES1704950-002**	--------	--------	--------
				Result	Result	----	----	----
EP125F: Halogenated Aromatic Compounds - Continued								
Chlorobenzene	108-90-7	0.1	µg/L	**0.27**	----	----	----	----
Bromobenzene	108-86-1	0.1	µg/L	<0.10	----	----	----	----
Benzylchloride	100-44-7	0.2	µg/L	<0.2	----	----	----	----
1.3-Dichlorobenzene	541-73-1	0.1	µg/L	<0.10	----	----	----	----
1.4-Dichlorobenzene	106-46-7	0.1	µg/L	<0.10	----	----	----	----
1.2-Dichlorobenzene	95-50-1	0.1	µg/L	<0.10	----	----	----	----
2-Chlorotoluene	95-49-8	0.1	µg/L	<0.1	----	----	----	----
4-Chlorotoluene	106-43-4	0.1	µg/L	<0.1	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.1	µg/L	<0.1	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.1	µg/L	<0.1	----	----	----	----
^ **Trichlorobenzenes (Sum)**	----	0.1	µg/L	<0.1	----	----	----	----
EP125G: Trihalomethanes								
Chloroform	67-66-3	0.1	µg/L	**0.27**	----	----	----	----
Bromodichloromethane	75-27-4	0.1	µg/L	<0.10	----	----	----	----
Dibromochloromethane	124-48-1	0.1	µg/L	<0.10	----	----	----	----
Bromoform	75-25-2	0.1	µg/L	<0.10	----	----	----	----
^ **Total Trihalomethanes**	----	0.1	µg/L	**0.27**	----	----	----	----
EP125H: Naphthalene								
Naphthalene	91-20-3	0.05	µg/L	<0.05	----	----	----	----
EP125L: Methyl t-butyl ether								
Methyl tert-butyl ether (MTBE)	1634-04-4	0.1	µg/L	<0.1	----	----	----	----
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.01	µg/L	<0.010	----	----	----	----
alpha-BHC	319-84-6	0.01	µg/L	<0.010	----	----	----	----
beta-BHC	319-85-7	0.01	µg/L	<0.010	----	----	----	----
delta-BHC	319-86-8	0.01	µg/L	<0.010	----	----	----	----
4.4`-DDD	72-54-8	0.01	µg/L	<0.010	----	----	----	----
4.4`-DDE	72-55-9	0.01	µg/L	<0.010	----	----	----	----
4.4`-DDT	50-29-3	0.01	µg/L	<0.010	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.01	µg/L	<0.010	----	----	----	----
Dieldrin	60-57-1	0.01	µg/L	<0.010	----	----	----	----
alpha-Endosulfan	959-98-8	0.01	µg/L	<0.010	----	----	----	----
beta-Endosulfan	33213-65-9	0.01	µg/L	<0.010	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**WATER DISCHARGE DAM 2 - FILTERED**	**WATER DISCHARGE DAM 2 - TOTAL**	----	----	----
			Client sampling date / time	[02-Mar-2017]	[02-Mar-2017]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704950-001**	**ES1704950-002**	--------	--------	--------
				Result	Result	----	----	----
EP131A: Organochlorine Pesticides - Continued								
Endosulfan sulfate	1031-07-8	0.01	µg/L	<0.010	----	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.01	µg/L	<0.010	----	----	----	----
Endrin	72-20-8	0.01	µg/L	<0.010	----	----	----	----
Endrin aldehyde	7421-93-4	0.01	µg/L	<0.010	----	----	----	----
Endrin ketone	53494-70-5	0.01	µg/L	<0.010	----	----	----	----
Heptachlor	76-44-8	0.005	µg/L	<0.005	----	----	----	----
Heptachlor epoxide	1024-57-3	0.01	µg/L	<0.010	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.01	µg/L	<0.010	----	----	----	----
gamma-BHC	58-89-9	0.01	µg/L	<0.010	----	----	----	----
Methoxychlor	72-43-5	0.01	µg/L	<0.010	----	----	----	----
cis-Chlordane	5103-71-9	0.01	µg/L	<0.010	----	----	----	----
trans-Chlordane	5103-74-2	0.01	µg/L	<0.010	----	----	----	----
^ **Total Chlordane (sum)**	----	0.01	µg/L	<0.010	----	----	----	----
Oxychlordane	27304-13-8	0.01	µg/L	<0.010	----	----	----	----
EP131B: Polychlorinated Biphenyls (as Aroclors)								
Total Polychlorinated biphenyls	----	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1016	12674-11-2	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1221	11104-28-2	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1232	11141-16-5	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1242	53469-21-9	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1248	12672-29-6	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1254	11097-69-1	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1260	11096-82-5	0.1	µg/L	<0.10	----	----	----	----
EP132C: Chlorinated Naphthalenes								
1-Chloronaphthalene	90-13-1	0.1	µg/L	<0.1	----	----	----	----
2-Chloronaphthalene	91-58-7	0.1	µg/L	<0.1	----	----	----	----
^ **Chloronaphthalenes (1- + 2-)**	----	0.1	µg/L	<0.1	----	----	----	----
EP203A: Explosives								
HMX	2691-41-0	1	µg/L	<1.0	----	----	----	----
RDX	----	1	µg/L	<1.0	----	----	----	----
1.3.5-Trinitrobenzene	99-35-4	1	µg/L	<1.0	----	----	----	----
1.3-Dinitrobenzene	99-65-0	1	µg/L	<1.0	----	----	----	----
Tetryl	479-45-8	1	µg/L	<1.0	----	----	----	----
2.4.6-TNT	118-96-7	1	µg/L	<1.0	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**WATER DISCHARGE DAM 2 - FILTERED**	**WATER DISCHARGE DAM 2 - TOTAL**	----	----	----
			Client sampling date / time	[02-Mar-2017]	[02-Mar-2017]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704950-001**	**ES1704950-002**	--------	--------	--------
				Result	Result	----	----	----
EP203A: Explosives - Continued								
4-Amino.2.6-DNT	19406-51-0	1	µg/L	<1.0	----	----	----	----
2-Amino-4.6-DNT	35572-78-2	1	µg/L	<1.0	----	----	----	----
4-& 2-AM-DNT(Isomeric Mixture)	----	1	µg/L	<1.0	----	----	----	----
2.4-Dinitrotoluene	121-14-2	1	µg/L	<1.0	----	----	----	----
2.6-Dinitrotoluene	606-20-2	1	µg/L	<1.0	----	----	----	----
2.4-& 2.6-DNT(Isomeric Mixture)	51-28-5/606-20-2	1	µg/L	<1.0	----	----	----	----
Nitrobenzene	98-95-3	1	µg/L	<1.0	----	----	----	----
2-Nitrotoluene	88-72-2	1	µg/L	<1.0	----	----	----	----
3-Nitrotoluene	99-08-1	1	µg/L	<1.0	----	----	----	----
4-Nitrotoluene	99-99-0	1	µg/L	<1.0	----	----	----	----
Nitroglycerine	55-63-0	5	µg/L	<5	----	----	----	----
PETN	78-11-5	5	µg/L	<5	----	----	----	----
EP234: Multiresidue Pesticides (ESI Positive)								
3-Hydroxy Carbofuran	16655-82-6	0.02	µg/L	<0.02	----	----	----	----
Abamectin	71751-41-2	0.1	µg/L	<0.1	----	----	----	----
Acephate	30560-19-1	0.5	µg/L	<0.5	----	----	----	----
Alachlor	15972-60-8	0.1	µg/L	<0.1	----	----	----	----
Aldicarb	116-06-3	0.05	µg/L	<0.05	----	----	----	----
Ametryn	834-12-8	0.01	µg/L	<0.01	----	----	----	----
Aminopyralid	150114-71-9	0.1	µg/L	<0.1	----	----	----	----
Amitraz	33089-61-1	100	µg/L	<100	----	----	----	----
Atrazine	1912-24-9	0.01	µg/L	<0.01	----	----	----	----
Atrazine-desethyl	6190-65-4	0.1	µg/L	<0.1	----	----	----	----
Atrazine-desisopropyl	1007-28-9	0.1	µg/L	<0.1	----	----	----	----
Azinphos-ethyl	2642-71-9	0.02	µg/L	<0.02	----	----	----	----
Azinphos-methyl	86-50-0	0.02	µg/L	<0.02	----	----	----	----
Azoxystrobin	131860-33-8	0.1	µg/L	<0.1	----	----	----	----
Bendiocarb	22781-23-3	0.1	µg/L	<0.10	----	----	----	----
Benomyl	17804-35-2	0.01	µg/L	**0.43**	----	----	----	----
Bensulfuron methyl	83055-99-6	0.1	µg/L	<0.1	----	----	----	----
Bensulide	741-58-2	0.1	µg/L	<0.1	----	----	----	----
Boscalid	188425-85-6	0.1	µg/L	<0.1	----	----	----	----
Bromacil	314-40-9	0.02	µg/L	<0.02	----	----	----	----
Bromophos-ethyl	4824-78-6	0.1	µg/L	<0.10	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**WATER DISCHARGE DAM 2 - FILTERED**	**WATER DISCHARGE DAM 2 - TOTAL**	----	----	----
			Client sampling date / time	[02-Mar-2017]	[02-Mar-2017]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704950-001**	**ES1704950-002**	--------	--------	--------
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Butachlor	23184-66-9	0.1	µg/L	<0.1	----	----	----	----
Carbaryl	63-25-2	0.01	µg/L	<0.01	----	----	----	----
Carbendazim (Thiophanate methyl)	10605-21-7	0.1	µg/L	**0.6**	----	----	----	----
Carbofenothion	786-19-6	0.02	µg/L	<0.02	----	----	----	----
Carbofuran	1563-66-2	0.01	µg/L	<0.01	----	----	----	----
Carboxin	5234-68-4	0.1	µg/L	<0.1	----	----	----	----
Carfentrazone-ethyl	128639-02-1	0.1	µg/L	<0.1	----	----	----	----
Chlorantraniliprole	500008-45-7	0.1	µg/L	<0.1	----	----	----	----
Chlorfenvinphos	470-90-6	0.02	µg/L	<0.02	----	----	----	----
Chloroxuron	1982-47-4	0.1	µg/L	<0.1	----	----	----	----
Chlorpyrifos	2921-88-2	0.02	µg/L	<0.02	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.1	µg/L	<0.2	----	----	----	----
Chlorsulfuron	64902-72-3	0.2	µg/L	<0.2	----	----	----	----
Coumaphos	56-72-4	0.01	µg/L	<0.01	----	----	----	----
Cyanazine	21725-46-2	0.02	µg/L	<0.02	----	----	----	----
Cyproconazole	94361-06-5	0.02	µg/L	<0.02	----	----	----	----
Cyprodinil	121552-61-2	0.01	µg/L	<0.01	----	----	----	----
Cyromazine	66215-27-8	0.05	µg/L	<0.05	----	----	----	----
Demeton-O	298-03-0	0.02	µg/L	<0.02	----	----	----	----
Demeton-O & Demeton-S	298-03-3/126-75-0	0.02	µg/L	<0.02	----	----	----	----
Demeton-S	126-75-0	0.02	µg/L	<0.02	----	----	----	----
Demeton-S-methyl	919-86-8	0.02	µg/L	<0.02	----	----	----	----
Diazinon	333-41-5	0.01	µg/L	<0.01	----	----	----	----
Dichlobenil	1194-65-6	0.1	µg/L	<0.1	----	----	----	----
Dichlorvos	62-73-7	0.2	µg/L	<0.20	----	----	----	----
Diclofop-methyl	51338-27-3	0.05	µg/L	<0.05	----	----	----	----
Difenoconazole	119446-68-3	0.02	µg/L	<0.02	----	----	----	----
Diflubenzuron	35367-38-5	0.1	µg/L	<0.1	----	----	----	----
Dimethoate	60-51-5	0.02	µg/L	<0.02	----	----	----	----
Diphenamid	957-51-7	0.1	µg/L	<0.1	----	----	----	----
Disulfoton	298-04-4	0.05	µg/L	<0.05	----	----	----	----
Diuron	330-54-1	0.02	µg/L	<0.02	----	----	----	----
EPN	2104-64-5	0.05	µg/L	<0.05	----	----	----	----
EPTC	759-94-4	0.1	µg/L	<0.1	----	----	----	----

Analytical Results

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

			Client sample ID	**WATER DISCHARGE DAM 2 - FILTERED**	**WATER DISCHARGE DAM 2 - TOTAL**	----	----	----
			Client sampling date / time	[02-Mar-2017]	[02-Mar-2017]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704950-001**	**ES1704950-002**	--------	--------	--------
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Ethion	563-12-2	0.02	µg/L	<0.02	----	----	----	----
Ethoprophos	13194-48-4	0.01	µg/L	<0.01	----	----	----	----
Etridiazole	2593-15-9	0.5	µg/L	<0.5	----	----	----	----
Fenamiphos	22224-92-6	0.01	µg/L	<0.01	----	----	----	----
Fenarimol	60168-88-9	0.02	µg/L	<0.02	----	----	----	----
Fenchlorphos (Ronnel)	299-84-3	10	µg/L	<10	----	----	----	----
Fenitrothion	122-14-5	2	µg/L	<2	----	----	----	----
Fenoxycarb	79127-80-3	0.1	µg/L	<0.1	----	----	----	----
Fensulfothion	115-90-2	0.01	µg/L	<0.01	----	----	----	----
Fenthion	55-38-9	0.05	µg/L	<0.05	----	----	----	----
Flamprop methyl	52756-25-9	0.1	µg/L	<0.1	----	----	----	----
Fluometuron	2164-17-2	0.01	µg/L	<0.01	----	----	----	----
Flusilazole	85509-19-9	0.02	µg/L	<0.02	----	----	----	----
Formothion	2540-82-1	20	µg/L	<20	----	----	----	----
Fosetyl Aluminium	39148-24-8	10	µg/L	<10	----	----	----	----
Haloxyfop	69806-34-4	0.1	µg/L	<0.1	----	----	----	----
Hexaconazole	79983-71-4	0.02	µg/L	<0.02	----	----	----	----
Hexazinone	51235-04-2	0.02	µg/L	<0.02	----	----	----	----
Imazapyr	94795-74-1	10	µg/L	<10.0	----	----	----	----
Indoxacarb	173584-44-6	0.1	µg/L	<0.1	----	----	----	----
Iodosulfuron methyl	144550-36-7	0.1	µg/L	<0.1	----	----	----	----
Irgarol	28159-98-0	0.002	µg/L	**0.005**	----	----	----	----
Isoproturon	34123-59-6	0.1	µg/L	<0.1	----	----	----	----
Malathion	121-75-5	0.02	µg/L	<0.02	----	----	----	----
Metalaxyl	57837-19-1	0.1	µg/L	<0.1	----	----	----	----
Metalaxyl-M	70630-17-0	0.1	µg/L	<0.1	----	----	----	----
Metaldehyde	108-62-3	10	µg/L	<10	----	----	----	----
Methidathion	950-37-8	0.1	µg/L	<0.1	----	----	----	----
Methiocarb	2032-65-7	0.01	µg/L	<0.01	----	----	----	----
Methomyl	16752-77-5	0.01	µg/L	<0.01	----	----	----	----
Metolachlor	51218-45-2	0.01	µg/L	<0.01	----	----	----	----
Metribuzin	21087-64-9	0.02	µg/L	<0.02	----	----	----	----
Mevinphos	7786-34-7	0.02	µg/L	<0.02	----	----	----	----
Molinate	2212-67-1	0.1	µg/L	<0.1	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**WATER DISCHARGE DAM 2 - FILTERED**	**WATER DISCHARGE DAM 2 - TOTAL**	**----**	**----**	**----**
			Client sampling date / time	[02-Mar-2017]	[02-Mar-2017]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704950-001**	**ES1704950-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Monocrotophos	6923-22-4	0.02	µg/L	<0.02	----	----	----	----
Myclobutanil	88671-89-0	0.1	µg/L	<0.1	----	----	----	----
Naftalofos	1491-41-4	1	µg/L	<1.0	----	----	----	----
Napropamide	15299-99-7	0.1	µg/L	<0.1	----	----	----	----
Nitralin	4726-14-1	0.1	µg/L	<0.1	----	----	----	----
Norflurazon	27314-13-2	0.1	µg/L	<0.1	----	----	----	----
Novaluron	116714-46-6	0.1	µg/L	<0.1	----	----	----	----
Omethoate	1113-02-6	0.01	µg/L	<0.01	----	----	----	----
Oxamyl	23135-22-0	0.01	µg/L	<0.01	----	----	----	----
Oxyfluorfen	42874-03-3	1	µg/L	<1.0	----	----	----	----
Paclobutrazole	76738-62-0	0.05	µg/L	<0.05	----	----	----	----
Parathion	56-38-2	0.2	µg/L	<0.2	----	----	----	----
Parathion-methyl	298-00-0	0.5	µg/L	<0.5	----	----	----	----
Pebulate	1114-71-2	0.1	µg/L	<0.1	----	----	----	----
Penconazole	66246-88-6	0.01	µg/L	<0.01	----	----	----	----
Pendimethalin	40487-42-1	0.05	µg/L	<0.05	----	----	----	----
Phorate	298-02-2	0.1	µg/L	<0.1	----	----	----	----
Pirimicarb	23103-98-2	0.1	µg/L	<0.1	----	----	----	----
Pirimiphos-ethyl	23505-41-1	0.01	µg/L	<0.01	----	----	----	----
Pirimiphos-methyl	29232-93-7	0.01	µg/L	<0.01	----	----	----	----
Prochloraz	67747-09-5	0.1	µg/L	<0.1	----	----	----	----
Profenofos	41198-08-7	0.01	µg/L	<0.01	----	----	----	----
Promecarb	2631-37-0	0.1	µg/L	<0.1	----	----	----	----
Prometryn	7287-19-6	0.01	µg/L	<0.01	----	----	----	----
Propachlor	1918-16-7	0.1	µg/L	<0.1	----	----	----	----
Propamocarb	24579-73-5	0.1	µg/L	<0.1	----	----	----	----
Propargite	2312-35-8	0.1	µg/L	<0.1	----	----	----	----
Propazine	139-40-2	0.01	µg/L	<0.01	----	----	----	----
Propiconazole	60207-90-1	0.05	µg/L	<0.05	----	----	----	----
Propyzamide	23950-58-5	0.1	µg/L	<0.1	----	----	----	----
Prothiofos	34643-46-4	0.1	µg/L	<0.1	----	----	----	----
Pyraclostrobin	175013-18-0	0.1	µg/L	<0.1	----	----	----	----
Pyrazophos	13457-18-6	0.1	µg/L	<0.1	----	----	----	----
Pyrimethanil	53112-28-0	0.02	µg/L	<0.02	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**WATER DISCHARGE DAM 2 - FILTERED**	**WATER DISCHARGE DAM 2 - TOTAL**	----	----	----
			Client sampling date / time	[02-Mar-2017]	[02-Mar-2017]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704950-001**	**ES1704950-002**	--------	--------	--------
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Pyriproxyfen	95737-68-1	0.1	µg/L	<0.1	----	----	----	----
Pyroxsulam	422556-08-9	0.1	µg/L	<0.1	----	----	----	----
Quinclorac	84087-01-4	0.1	µg/L	<0.1	----	----	----	----
Rimsulfuron	122931-48-0	0.1	µg/L	<0.1	----	----	----	----
Siduron	1982-49-6	0.1	µg/L	<0.1	----	----	----	----
Simazine	122-34-9	0.02	µg/L	**0.03**	----	----	----	----
Spirotetramat	203313-25-1	0.1	µg/L	<0.1	----	----	----	----
Sulfotep	3689-24-5	0.005	µg/L	<0.005	----	----	----	----
Sulprofos	35400-43-2	0.05	µg/L	<0.05	----	----	----	----
Tebuconazole	107534-96-3	0.01	µg/L	<0.01	----	----	----	----
Tebuthiuron	34014-18-1	0.02	µg/L	<0.02	----	----	----	----
Temephos	3383-96-8	0.02	µg/L	<0.02	----	----	----	----
Terbacil	5902-51-2	0.1	µg/L	<0.1	----	----	----	----
Terbufos	13071-79-9	0.01	µg/L	<0.01	----	----	----	----
Terbuthylazine	5915-41-3	0.01	µg/L	<0.01	----	----	----	----
Terbutryn	886-50-0	0.01	µg/L	<0.01	----	----	----	----
Tetrachlorvinphos	22248-79-9	0.01	µg/L	<0.01	----	----	----	----
Tetraconazole	112281-77-3	0.1	µg/L	<0.1	----	----	----	----
Thiamethoxam	153719-23-4	0.02	µg/L	**0.02**	----	----	----	----
Thiobencarb	28249-77-6	0.01	µg/L	<0.01	----	----	----	----
Thiodicarb	59669-26-0	0.01	µg/L	<0.01	----	----	----	----
Thiometon	640-15-3	0.5	µg/L	<0.5	----	----	----	----
Toltrazuril	69004-03-1	0.5	µg/L	<0.5	----	----	----	----
Triadimefon	43121-43-3	0.1	µg/L	<0.1	----	----	----	----
Triadimenol	55219-65-3	0.1	µg/L	<0.1	----	----	----	----
Triazophos	24017-47-8	0.005	µg/L	<0.005	----	----	----	----
Trichlorfon	52-68-6	0.02	µg/L	<0.02	----	----	----	----
Trichloronate	327-98-0	0.5	µg/L	<0.5	----	----	----	----
Trifloxystrobin	141517-21-7	0.1	µg/L	<0.1	----	----	----	----
Trifloxysulfuron-sodium	199119-58-9	0.1	µg/L	<0.1	----	----	----	----
Trifluralin	1582-09-8	10	µg/L	<10.0	----	----	----	----
Trinexapac Ethyl	95266-40-3	1	µg/L	<1	----	----	----	----
Vernolate	1929-77-7	0.1	µg/L	<0.1	----	----	----	----
EP247: Phenolics and Related Compounds								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**WATER DISCHARGE DAM 2 - FILTERED**	**WATER DISCHARGE DAM 2 - TOTAL**	----	----	----
			Client sampling date / time	[02-Mar-2017]	[02-Mar-2017]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704950-001**	**ES1704950-002**	--------	--------	--------
				Result	Result	----	----	----
EP247: Phenolics and Related Compounds - Continued								
2,4-Dinitrophenol	51-28-5	0.01	µg/L	<0.01	----	----	----	----
2-Methyl-4.6-dinitrophenol	8071-51-0	0.05	µg/L	<0.05	----	----	----	----
4-Nonylphenol (mixture of isomers)	84852-15-3	0.1	µg/L	<0.10	----	----	----	----
Hexachlorophene	70-30-4	0.1	µg/L	<0.10	----	----	----	----
4-Nitrophenol	100-02-7	0.1	µg/L	**0.37**	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.1	µg/L	<0.10	----	----	----	----
Pentachlorophenol	87-86-5	0.1	µg/L	<0.10	----	----	----	----
Dinoseb	88-85-7	0.1	µg/L	<0.10	----	----	----	----
Dalapon	75-99-0	0.1	µg/L	<0.10	----	----	----	----
Bisphenol-A	80-05-7	0.05	µg/L	<0.05	----	----	----	----
MW002: Heterotrophic Plate Count								
Heterotrophic Plate Count (22°C)	----	1	CFU/mL	----	**~57000**	----	----	----
MW006: Faecal Coliforms & E.coli by MF								
Escherichia coli	----	1	CFU/100mL	----	<2	----	----	----
MW007: Coliforms by MF								
Coliforms	----	1	CFU/100mL	----	<2	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	**17.9**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%	**41.2**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%	**47.8**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	**92.4**	----	----	----	----
Anthracene-d10	1719-06-8	1	%	**89.1**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1	%	**80.6**	----	----	----	----
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	2	%	**35.4**	----	----	----	----
Phenol-d6	13127-88-3	2	%	**34.7**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	2	%	**56.2**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	2	%	**54.9**	----	----	----	----
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	2	%	**68.4**	----	----	----	----
1.2-Dichlorobenzene-D4	2199-69-1	2	%	**62.8**	----	----	----	----
2-Fluorobiphenyl	321-60-8	2	%	**75.8**	----	----	----	----

Analytical Results

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

			Client sample ID	**WATER DISCHARGE DAM 2 - FILTERED**	**WATER DISCHARGE DAM 2 - TOTAL**	----	----	----
			Client sampling date / time	[02-Mar-2017]	[02-Mar-2017]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1704950-001**	**ES1704950-002**	--------	--------	--------
				Result	Result	----	----	----
EP075T: Base/Neutral Extractable Surrogates - Continued								
Anthracene-d10	1719-06-8	2	%	**89.2**	----	----	----	----
4-Terphenyl-d14	1718-51-0	2	%	**86.3**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**110**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**95.0**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**91.4**	----	----	----	----
EP094S: Pesticide Surrogate								
DEF	78-48-8	0.5	%	**104**	----	----	----	----
EP125S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**112**	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	**110**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**111**	----	----	----	----
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.01	%	**96.8**	----	----	----	----
EP131T: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	**95.8**	----	----	----	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**58.9**	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%	**98.6**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**111**	----	----	----	----
EP203S: Explosives Surrogate								
o-Dinitrobenzene	528-29-0	1	%	**84.6**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	*CAS Number*	*Recovery Limits (%)* Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	10	117
Phenol-d6	13127-88-3	10	69
2-Chlorophenol-D4	93951-73-6	21	130
2.4.6-Tribromophenol	118-79-6	10	151
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	29	142
1.2-Dichlorobenzene-D4	2199-69-1	24	121
2-Fluorobiphenyl	321-60-8	27	135
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	21	123
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128
EP094S: Pesticide Surrogate			
DEF	78-48-8	42	143
EP125S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	65	127
4-Bromofluorobenzene	460-00-4	68	124
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	14	166
EP131T: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	10	144
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	135
Anthracene-d10	1719-06-8	48	138
4-Terphenyl-d14	1718-51-0	48	144
EP203S: Explosives Surrogate			

Sub-Matrix: **WATER**

Compound	*CAS Number*	***Recovery Limits (%)*** ***Low***	 ***High***
EP203S: Explosives Surrogate - Continued			
o-Dinitrobenzene	528-29-0	51	125

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order : **ES1705344**
Client : **BORAL RECYCLING - WIDEMERE**
Contact : PHILIP PATERSON
Address : Boral Recycling
Wetherill Park, NSW 2164
Telephone : 02 9604 9101
Project : SURFACE WATER ANALYSIS
Order number : tba
C-O-C number : ----
Sampler : CHRIS V.
Site : ----
Quote number : SY/662/16 V4
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 20
Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 07-Mar-2017 14:00
Date Analysis Commenced : 07-Mar-2017
Issue Date : 17-Mar-2017 16:26

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Amanda Conkie	Organic Chemist	Brisbane Organics, Stafford, QLD
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Dian Dao		Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW
Raymond Commodore	Instrument Chemist	Sydney Inorganics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW
Somlok Chai	Microbiologist	Sydney Microbiology, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- EG093: Sample ES1705344 #001 was run on EG094 method due to low TDS content.
- EP247 : Poor matrix spike recovery due to matrix interferences.
- CFU = colony forming unit
- MF = membrane filtration
- EP050: The MBAS reported is calculated as LAS, mol wt ___342____.
- Total PAH reported as the sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene and Benzo(g,h,i)perylene.
- EP075: 'Sum of PAH' is the sum of the USEPA 16 priority PAHs
- MW002 is ALS's internal code and is equivalent to AS4276.3.1.
- MW006 is ALS's internal code and is equivalent to AS4276.7.
- MW007 is ALS's internal code and is equivalent to AS4276.5.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**POST DREDGING DAM 2 (2) - FILTERED**	**POST DREDGING DAM 2 (2) - TOTAL**	----	----	----
			Client sampling date / time	07-Mar-2017 00:00	07-Mar-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1705344-001**	**ES1705344-002**	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	----	**10.3**	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	----	**600**	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	----	**5**	----	----	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	----	**13.9**	----	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	**40**	----	----	----	----
EA075: Redox Potential								
Redox Potential	----	0.1	mV	**97.0**	----	----	----	----
pH Redox	----	0.01	pH Unit	**11.0**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**83**	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**39**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**16**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	<1	----	----	----	----
Sodium	7440-23-5	1	mg/L	**79**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**41**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Gallium	7440-55-3	0.001	mg/L	**0.004**	----	----	----	----
Lanthanum	7439-91-0	0.001	mg/L	<0.001	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.00004	mg/L	<0.00004	----	----	----	----
EG049G LL-F: Dissolved Trivalent Chromium - Low Level								
Trivalent Chromium	16065-83-1	0.001	mg/L	<0.001	----	----	----	----
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level								
Hexavalent Chromium	18540-29-9	0.001	mg/L	**0.031**	----	----	----	----
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	**17.0**	----	----	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**POST DREDGING DAM 2 (2) - FILTERED**	**POST DREDGING DAM 2 (2) - TOTAL**	----	----	----
			Client sampling date / time	07-Mar-2017 00:00	07-Mar-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1705344-001**	**ES1705344-002**	--------	--------	--------
				Result	Result	----	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS - Continued								
Aluminium	7429-90-5	5	µg/L	**2250**	----	----	----	----
Antimony	7440-36-0	0.5	µg/L	**1.8**	----	----	----	----
Arsenic	7440-38-2	0.5	µg/L	**1.6**	----	----	----	----
Barium	7440-39-3	1	µg/L	**9**	----	----	----	----
Beryllium	7440-41-7	0.1	µg/L	<0.1	----	----	----	----
Bismuth	7440-69-9	0.1	µg/L	<0.1	----	----	----	----
Boron	7440-42-8	100	µg/L	<100	----	----	----	----
Cadmium	7440-43-9	0.2	µg/L	<0.2	----	----	----	----
Chromium	7440-47-3	0.5	µg/L	**25.6**	----	----	----	----
Cobalt	7440-48-4	0.2	µg/L	**2.1**	----	----	----	----
Copper	7440-50-8	1	µg/L	**21**	----	----	----	----
Iron	7439-89-6	5	µg/L	**46**	----	----	----	----
Lead	7439-92-1	0.2	µg/L	<0.2	----	----	----	----
Manganese	7439-96-5	0.5	µg/L	<0.5	----	----	----	----
Molybdenum	7439-98-7	0.1	µg/L	**19.1**	----	----	----	----
Nickel	7440-02-0	0.5	µg/L	**4.1**	----	----	----	----
Selenium	7782-49-2	2	µg/L	<2	----	----	----	----
Silver	7440-22-4	0.1	µg/L	<0.1	----	----	----	----
Strontium	7440-24-6	10	µg/L	**150**	----	----	----	----
Thallium	7440-28-0	0.1	µg/L	<0.1	----	----	----	----
Tin	7440-31-5	5	µg/L	<5	----	----	----	----
Uranium	7440-61-1	0.1	µg/L	<0.1	----	----	----	----
Vanadium	7440-62-2	0.5	µg/L	**43.0**	----	----	----	----
Zinc	7440-66-6	5	µg/L	<5	----	----	----	----
EK010-1: Chlorine								
Total Residual Chlorine	----	0.02	mg/L	<0.02	----	----	----	----
EK025SF: Free CN by Segmented Flow Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	**0.008**	----	----	----	----
EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser								
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	----	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.2**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**POST DREDGING DAM 2 (2) - FILTERED**	**POST DREDGING DAM 2 (2) - TOTAL**	----	----	----
			Client sampling date / time	07-Mar-2017 00:00	07-Mar-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1705344-001**	**ES1705344-002**	--------	--------	--------
				Result	Result	----	----	----
EK084: Un-ionized Hydrogen Sulfide								
Unionized Hydrogen Sulfide	----	0.1	mg/L	<0.1	----	----	----	----
EK255A: Ammonia								
Ammonia as N	7664-41-7	0.005	mg/L	**0.337**	----	----	----	----
EK257A: Nitrite								
Nitrite as N	14797-65-0	0.002	mg/L	**0.967**	----	----	----	----
EK258A: Nitrate								
Nitrate as N	14797-55-8	0.002	mg/L	**6.10**	----	----	----	----
EK259A: Nitrite and Nitrate (NOx)								
Nitrite + Nitrate as N	----	0.002	mg/L	**7.07**	----	----	----	----
EK261A: Total Kjeldahl Nitrogen								
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	**0.38**	----	----	----	----
EK262A: Total Nitrogen								
Total Nitrogen as N	----	0.01	mg/L	**7.45**	----	----	----	----
EK267A: Total Phosphorus (Persulfate Digestion)								
Total Phosphorus as P	----	0.005	mg/L	**0.012**	----	----	----	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	**13**	----	----	----	----
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m^3	<1	----	----	----	----
EP020: Oil and Grease (O&G)								
Oil & Grease	----	5	mg/L	----	<5	----	----	----
EP026SPF: Chemical Oxygen Demand (Spectrophotometric); Filtered								
Chemical Oxygen Demand - Filtered	----	10	mg/L	**48**	----	----	----	----
EP030F: Biochemical Oxygen Demand (Filtered)								
Biochemical Oxygen Demand (Filtered)	----	2	mg/L	<2	----	----	----	----
EP050: Anionic Surfactants as MBAS								
Anionic Surfactants as MBAS	----	0.1	mg/L	**0.3**	----	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1	µg/L	<1.0	----	----	----	----
2-Chlorophenol	95-57-8	1	µg/L	<1.0	----	----	----	----
2-Methylphenol	95-48-7	1	µg/L	<1.0	----	----	----	----
3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	----	----	----	----
2-Nitrophenol	88-75-5	1	µg/L	<1.0	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**POST DREDGING DAM 2 (2) - FILTERED**	**POST DREDGING DAM 2 (2) - TOTAL**	----	----	----
			Client sampling date / time	07-Mar-2017 00:00	07-Mar-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1705344-001**	**ES1705344-002**	--------	--------	--------
				Result	Result	----	----	----
EP075(SIM)A: Phenolic Compounds - Continued								
2.4-Dimethylphenol	105-67-9	1	µg/L	<1.0	----	----	----	----
2.4-Dichlorophenol	120-83-2	1	µg/L	<1.0	----	----	----	----
2.6-Dichlorophenol	87-65-0	1	µg/L	<1.0	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	1	µg/L	<1.0	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	1	µg/L	<1.0	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	1	µg/L	<1.0	----	----	----	----
Pentachlorophenol	87-86-5	2	µg/L	<2.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	----	----	----	----
EP075C: Phthalate Esters								
Dimethyl phthalate	131-11-3	2	µg/L	<2	----	----	----	----
Diethyl phthalate	84-66-2	2	µg/L	<2	----	----	----	----
Di-n-butyl phthalate	84-74-2	2	µg/L	<2	----	----	----	----
Butyl benzyl phthalate	85-68-7	2	µg/L	<2	----	----	----	----
bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L	<10	----	----	----	----
Di-n-octylphthalate	117-84-0	2	µg/L	<2	----	----	----	----
EP075G: Chlorinated Hydrocarbons								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**POST DREDGING DAM 2 (2) - FILTERED**	**POST DREDGING DAM 2 (2) - TOTAL**	----	----	----
			Client sampling date / time	07-Mar-2017 00:00	07-Mar-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1705344-001**	**ES1705344-002**	--------	--------	--------
				Result	Result	----	----	----
EP075G: Chlorinated Hydrocarbons - Continued								
1.3-Dichlorobenzene	541-73-1	2	µg/L	<2	----	----	----	----
1.4-Dichlorobenzene	106-46-7	2	µg/L	<2	----	----	----	----
1.2-Dichlorobenzene	95-50-1	2	µg/L	<2	----	----	----	----
Hexachloroethane	67-72-1	2	µg/L	<2	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	2	µg/L	<2	----	----	----	----
Hexachloropropylene	1888-71-7	2	µg/L	<2	----	----	----	----
Hexachlorobutadiene	87-68-3	2	µg/L	<2	----	----	----	----
Hexachlorocyclopentadiene	77-47-4	10	µg/L	<10	----	----	----	----
Pentachlorobenzene	608-93-5	2	µg/L	<2	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	4	µg/L	<4	----	----	----	----
EP075H: Anilines and Benzidines								
Aniline	62-53-3	2	µg/L	<2	----	----	----	----
4-Chloroaniline	106-47-8	2	µg/L	<2	----	----	----	----
2-Nitroaniline	88-74-4	4	µg/L	<4	----	----	----	----
3-Nitroaniline	99-09-2	4	µg/L	<4	----	----	----	----
Dibenzofuran	132-64-9	2	µg/L	<2	----	----	----	----
4-Nitroaniline	100-01-6	2	µg/L	<2	----	----	----	----
Carbazole	86-74-8	2	µg/L	<2	----	----	----	----
3.3`-Dichlorobenzidine	91-94-1	2	µg/L	<2	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**POST DREDGING DAM 2 (2) - FILTERED**	**POST DREDGING DAM 2 (2) - TOTAL**	**----**	**----**	**----**
			Client sampling date / time	07-Mar-2017 00:00	07-Mar-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1705344-001**	**ES1705344-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued								
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ **Total Xylenes**	1330-20-7	2	µg/L	<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP094A: Synthetic Pyrethroids								
Bioresmethrin	28434-01-07	0.5	µg/L	<0.5	----	----	----	----
Bifenthrin	82657-04-3	0.5	µg/L	<0.5	----	----	----	----
Phenothrin	26002-80-2	0.5	µg/L	<0.5	----	----	----	----
Lambda-cyhalothrin	68085-85-8	0.5	µg/L	<0.5	----	----	----	----
Permethrin	52645-53-1	0.5	µg/L	<0.5	----	----	----	----
Cyfluthrin	68359-37-5	0.5	µg/L	<0.5	----	----	----	----
Cypermethrin	52315-07-8	0.5	µg/L	<0.5	----	----	----	----
Fenvalverate & Esfenvalerate	51630-58-1/66230-04-	0.5	µg/L	<0.5	----	----	----	----
Deltamethrin & Tralomethrin	62229-77-0/66841-25-	0.5	µg/L	<0.5	----	----	----	----
Allethrin	584-79-2	0.5	µg/L	<0.5	----	----	----	----
Transfluthrin	118712-89-3	0.5	µg/L	<0.5	----	----	----	----
Tau-fluvalinate	102851-06-9	0.5	µg/L	<0.5	----	----	----	----
Tetramethrin	68085-85-8	0.5	µg/L	<0.5	----	----	----	----
EP094B: Synergist								
Piperonyl Butoxide	63993-73-7	0.5	µg/L	<0.5	----	----	----	----
EP117: Alcohols								
Ethanol	64-17-5	50	µg/L	<50	----	----	----	----
Isopropanol	67-63-0	50	µg/L	**70**	----	----	----	----
n-Propanol	71-23-8	50	µg/L	<50	----	----	----	----
Isobutanol	78-83-1	50	µg/L	<50	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**POST DREDGING DAM 2 (2) - FILTERED**	**POST DREDGING DAM 2 (2) - TOTAL**	----	----	----
			Client sampling date / time	07-Mar-2017 00:00	07-Mar-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1705344-001**	**ES1705344-002**	--------	--------	--------
				Result	Result	----	----	----
EP117: Alcohols - Continued								
n-Butanol	71-36-3	50	µg/L	<50	----	----	----	----
EP125A: Monocyclic Aromatic Hydrocarbons								
Benzene	71-43-2	0.05	µg/L	<0.05	----	----	----	----
Toluene	108-88-3	0.5	µg/L	**0.5**	----	----	----	----
Ethylbenzene	100-41-4	0.05	µg/L	**0.06**	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.05	µg/L	**0.27**	----	----	----	----
Styrene	100-42-5	0.05	µg/L	<0.05	----	----	----	----
ortho-Xylene	95-47-6	0.05	µg/L	**0.15**	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	0.05	µg/L	<0.05	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	0.05	µg/L	<0.05	----	----	----	----
EP125D: Fumigants								
1.2-Dichloropropane	78-87-5	0.1	µg/L	<0.1	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.1	µg/L	<0.1	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.1	µg/L	<0.1	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.1	µg/L	<0.1	----	----	----	----
EP125E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	0.5	µg/L	<0.5	----	----	----	----
Vinyl chloride	75-01-4	0.3	µg/L	<0.3	----	----	----	----
Bromomethane	74-83-9	0.5	µg/L	<0.5	----	----	----	----
Chloroethane	75-00-3	0.5	µg/L	<0.5	----	----	----	----
Trichlorofluoromethane	75-69-4	0.5	µg/L	<0.5	----	----	----	----
1.1-Dichloroethene	75-35-4	0.1	µg/L	<0.1	----	----	----	----
Dichloromethane	75-09-2	1	µg/L	**1.2**	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	0.1	µg/L	<0.1	----	----	----	----
1.1-Dichloroethane	75-34-3	0.1	µg/L	<0.1	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	0.1	µg/L	<0.1	----	----	----	----
Bromochloromethane	74-97-5	0.5	µg/L	<0.5	----	----	----	----
1.2-Dichloroethane	107-06-2	0.1	µg/L	<0.1	----	----	----	----
1.1.1-Trichloroethane	71-55-6	0.1	µg/L	<0.1	----	----	----	----
Carbon Tetrachloride	56-23-5	0.05	µg/L	<0.05	----	----	----	----
Trichloroethene	79-01-6	0.05	µg/L	<0.05	----	----	----	----
Tetrachloroethene	127-18-4	0.05	µg/L	<0.05	----	----	----	----
Hexachlorobutadiene	87-68-3	0.04	µg/L	<0.04	----	----	----	----
EP125F: Halogenated Aromatic Compounds								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**POST DREDGING DAM 2 (2) - FILTERED**	**POST DREDGING DAM 2 (2) - TOTAL**	----	----	----
			Client sampling date / time	07-Mar-2017 00:00	07-Mar-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1705344-001**	**ES1705344-002**	--------	--------	--------
				Result	Result	----	----	----
EP125F: Halogenated Aromatic Compounds - Continued								
Chlorobenzene	108-90-7	0.1	µg/L	**0.15**	----	----	----	----
Bromobenzene	108-86-1	0.1	µg/L	<0.10	----	----	----	----
Benzylchloride	100-44-7	0.2	µg/L	<0.2	----	----	----	----
1.3-Dichlorobenzene	541-73-1	0.1	µg/L	<0.10	----	----	----	----
1.4-Dichlorobenzene	106-46-7	0.1	µg/L	<0.10	----	----	----	----
1.2-Dichlorobenzene	95-50-1	0.1	µg/L	<0.10	----	----	----	----
2-Chlorotoluene	95-49-8	0.1	µg/L	<0.1	----	----	----	----
4-Chlorotoluene	106-43-4	0.1	µg/L	<0.1	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.1	µg/L	<0.1	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.1	µg/L	<0.1	----	----	----	----
^ **Trichlorobenzenes (Sum)**	----	0.1	µg/L	<0.1	----	----	----	----
EP125G: Trihalomethanes								
Chloroform	67-66-3	0.1	µg/L	<0.10	----	----	----	----
Bromodichloromethane	75-27-4	0.1	µg/L	<0.10	----	----	----	----
Dibromochloromethane	124-48-1	0.1	µg/L	<0.10	----	----	----	----
Bromoform	75-25-2	0.1	µg/L	<0.10	----	----	----	----
^ **Total Trihalomethanes**	----	0.1	µg/L	<0.10	----	----	----	----
EP125H: Naphthalene								
Naphthalene	91-20-3	0.05	µg/L	<0.05	----	----	----	----
EP125L: Methyl t-butyl ether								
Methyl tert-butyl ether (MTBE)	1634-04-4	0.1	µg/L	<0.1	----	----	----	----
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.01	µg/L	<0.010	----	----	----	----
alpha-BHC	319-84-6	0.01	µg/L	<0.010	----	----	----	----
beta-BHC	319-85-7	0.01	µg/L	<0.010	----	----	----	----
delta-BHC	319-86-8	0.01	µg/L	<0.010	----	----	----	----
4.4`-DDD	72-54-8	0.01	µg/L	<0.010	----	----	----	----
4.4`-DDE	72-55-9	0.01	µg/L	<0.010	----	----	----	----
4.4`-DDT	50-29-3	0.01	µg/L	<0.010	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.01	µg/L	<0.010	----	----	----	----
Dieldrin	60-57-1	0.01	µg/L	<0.010	----	----	----	----
alpha-Endosulfan	959-98-8	0.01	µg/L	<0.010	----	----	----	----
beta-Endosulfan	33213-65-9	0.01	µg/L	<0.010	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**POST DREDGING DAM 2 (2) - FILTERED**	**POST DREDGING DAM 2 (2) - TOTAL**	**----**	**----**	**----**
			Client sampling date / time	07-Mar-2017 00:00	07-Mar-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1705344-001**	**ES1705344-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP131A: Organochlorine Pesticides - Continued								
Endosulfan sulfate	1031-07-8	0.01	µg/L	<0.010	----	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.01	µg/L	<0.010	----	----	----	----
Endrin	72-20-8	0.01	µg/L	<0.010	----	----	----	----
Endrin aldehyde	7421-93-4	0.01	µg/L	<0.010	----	----	----	----
Endrin ketone	53494-70-5	0.01	µg/L	<0.010	----	----	----	----
Heptachlor	76-44-8	0.005	µg/L	<0.005	----	----	----	----
Heptachlor epoxide	1024-57-3	0.01	µg/L	<0.010	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.01	µg/L	<0.010	----	----	----	----
gamma-BHC	58-89-9	0.01	µg/L	<0.010	----	----	----	----
Methoxychlor	72-43-5	0.01	µg/L	<0.010	----	----	----	----
cis-Chlordane	5103-71-9	0.01	µg/L	<0.010	----	----	----	----
trans-Chlordane	5103-74-2	0.01	µg/L	<0.010	----	----	----	----
^ **Total Chlordane (sum)**	----	0.01	µg/L	<0.010	----	----	----	----
Oxychlordane	27304-13-8	0.01	µg/L	<0.010	----	----	----	----
EP131B: Polychlorinated Biphenyls (as Aroclors)								
Total Polychlorinated biphenyls	----	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1016	12674-11-2	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1221	11104-28-2	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1232	11141-16-5	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1242	53469-21-9	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1248	12672-29-6	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1254	11097-69-1	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1260	11096-82-5	0.1	µg/L	<0.10	----	----	----	----
EP132C: Chlorinated Naphthalenes								
1-Chloronaphthalene	90-13-1	0.1	µg/L	<0.1	----	----	----	----
2-Chloronaphthalene	91-58-7	0.1	µg/L	<0.1	----	----	----	----
^ **Chloronaphthalenes (1- + 2-)**	----	0.1	µg/L	<0.1	----	----	----	----
EP203A: Explosives								
HMX	2691-41-0	1	µg/L	<1.0	----	----	----	----
RDX	----	1	µg/L	<1.0	----	----	----	----
1.3.5-Trinitrobenzene	99-35-4	1	µg/L	<1.0	----	----	----	----
1.3-Dinitrobenzene	99-65-0	1	µg/L	<1.0	----	----	----	----
Tetryl	479-45-8	1	µg/L	<1.0	----	----	----	----
2.4.6-TNT	118-96-7	1	µg/L	<1.0	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**POST DREDGING DAM 2 (2) - FILTERED**	**POST DREDGING DAM 2 (2) - TOTAL**	**----**	**----**	**----**
			Client sampling date / time	07-Mar-2017 00:00	07-Mar-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1705344-001**	**ES1705344-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP203A: Explosives - Continued								
4-Amino.2.6-DNT	19406-51-0	1	µg/L	<1.0	----	----	----	----
2-Amino-4.6-DNT	35572-78-2	1	µg/L	<1.0	----	----	----	----
4-& 2-AM-DNT(Isomeric Mixture)	----	1	µg/L	<1.0	----	----	----	----
2.4-Dinitrotoluene	121-14-2	1	µg/L	<1.0	----	----	----	----
2.6-Dinitrotoluene	606-20-2	1	µg/L	<1.0	----	----	----	----
2.4-& 2.6-DNT(Isomeric Mixture)	51-28-5/606-20-2	1	µg/L	<1.0	----	----	----	----
Nitrobenzene	98-95-3	1	µg/L	<1.0	----	----	----	----
2-Nitrotoluene	88-72-2	1	µg/L	<1.0	----	----	----	----
3-Nitrotoluene	99-08-1	1	µg/L	<1.0	----	----	----	----
4-Nitrotoluene	99-99-0	1	µg/L	<1.0	----	----	----	----
Nitroglycerine	55-63-0	5	µg/L	<5	----	----	----	----
PETN	78-11-5	5	µg/L	<5	----	----	----	----
EP234: Multiresidue Pesticides (ESI Positive)								
3-Hydroxy Carbofuran	16655-82-6	0.02	µg/L	<0.02	----	----	----	----
Abamectin	71751-41-2	0.1	µg/L	<0.1	----	----	----	----
Acephate	30560-19-1	0.5	µg/L	<0.5	----	----	----	----
Alachlor	15972-60-8	0.1	µg/L	<0.1	----	----	----	----
Aldicarb	116-06-3	0.05	µg/L	<0.05	----	----	----	----
Ametryn	834-12-8	0.01	µg/L	<0.01	----	----	----	----
Aminopyralid	150114-71-9	0.1	µg/L	<0.1	----	----	----	----
Amitraz	33089-61-1	100	µg/L	<100	----	----	----	----
Atrazine	1912-24-9	0.01	µg/L	<0.01	----	----	----	----
Atrazine-desethyl	6190-65-4	0.1	µg/L	<0.1	----	----	----	----
Atrazine-desisopropyl	1007-28-9	0.1	µg/L	<0.1	----	----	----	----
Azinphos-ethyl	2642-71-9	0.02	µg/L	<0.02	----	----	----	----
Azinphos-methyl	86-50-0	0.02	µg/L	<0.02	----	----	----	----
Azoxystrobin	131860-33-8	0.1	µg/L	<0.1	----	----	----	----
Bendiocarb	22781-23-3	0.1	µg/L	<0.10	----	----	----	----
Benomyl	17804-35-2	0.01	µg/L	**0.50**	----	----	----	----
Bensulfuron methyl	83055-99-6	0.1	µg/L	<0.1	----	----	----	----
Bensulide	741-58-2	0.1	µg/L	<0.1	----	----	----	----
Boscalid	188425-85-6	0.1	µg/L	<0.1	----	----	----	----
Bromacil	314-40-9	0.02	µg/L	<0.02	----	----	----	----
Bromophos-ethyl	4824-78-6	0.1	µg/L	<0.10	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**POST DREDGING DAM 2 (2) - FILTERED**	**POST DREDGING DAM 2 (2) - TOTAL**	**----**	**----**	**----**
			Client sampling date / time	07-Mar-2017 00:00	07-Mar-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1705344-001**	**ES1705344-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Butachlor	23184-66-9	0.1	µg/L	<0.1	----	----	----	----
Carbaryl	63-25-2	0.01	µg/L	<0.01	----	----	----	----
Carbendazim (Thiophanate methyl)	10605-21-7	0.1	µg/L	**0.6**	----	----	----	----
Carbofenothion	786-19-6	0.02	µg/L	<0.02	----	----	----	----
Carbofuran	1563-66-2	0.01	µg/L	<0.01	----	----	----	----
Carboxin	5234-68-4	0.1	µg/L	<0.1	----	----	----	----
Carfentrazone-ethyl	128639-02-1	0.1	µg/L	<0.1	----	----	----	----
Chlorantraniliprole	500008-45-7	0.1	µg/L	<0.1	----	----	----	----
Chlorfenvinphos	470-90-6	0.02	µg/L	<0.02	----	----	----	----
Chloroxuron	1982-47-4	0.1	µg/L	<0.1	----	----	----	----
Chlorpyrifos	2921-88-2	0.02	µg/L	<0.02	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.1	µg/L	<0.2	----	----	----	----
Chlorsulfuron	64902-72-3	0.2	µg/L	<0.2	----	----	----	----
Coumaphos	56-72-4	0.01	µg/L	<0.01	----	----	----	----
Cyanazine	21725-46-2	0.02	µg/L	<0.02	----	----	----	----
Cyproconazole	94361-06-5	0.02	µg/L	<0.02	----	----	----	----
Cyprodinil	121552-61-2	0.01	µg/L	<0.01	----	----	----	----
Cyromazine	66215-27-8	0.05	µg/L	**0.06**	----	----	----	----
Demeton-O	298-03-0	0.02	µg/L	<0.02	----	----	----	----
Demeton-O & Demeton-S	298-03-3/126-75-0	0.02	µg/L	<0.02	----	----	----	----
Demeton-S	126-75-0	0.02	µg/L	<0.02	----	----	----	----
Demeton-S-methyl	919-86-8	0.02	µg/L	<0.02	----	----	----	----
Diazinon	333-41-5	0.01	µg/L	<0.01	----	----	----	----
Dichlobenil	1194-65-6	0.1	µg/L	<0.1	----	----	----	----
Dichlorvos	62-73-7	0.2	µg/L	<0.20	----	----	----	----
Diclofop-methyl	51338-27-3	0.05	µg/L	<0.05	----	----	----	----
Difenoconazole	119446-68-3	0.02	µg/L	<0.02	----	----	----	----
Diflubenzuron	35367-38-5	0.1	µg/L	<0.1	----	----	----	----
Dimethoate	60-51-5	0.02	µg/L	<0.02	----	----	----	----
Diphenamid	957-51-7	0.1	µg/L	<0.1	----	----	----	----
Disulfoton	298-04-4	0.05	µg/L	<0.05	----	----	----	----
Diuron	330-54-1	0.02	µg/L	<0.02	----	----	----	----
EPN	2104-64-5	0.05	µg/L	<0.05	----	----	----	----
EPTC	759-94-4	0.1	µg/L	<0.1	----	----	----	----

Analytical Results

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

			Client sample ID	**POST DREDGING DAM 2 (2) - FILTERED**	**POST DREDGING DAM 2 (2) - TOTAL**	**----**	**----**	**----**
			Client sampling date / time	07-Mar-2017 00:00	07-Mar-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1705344-001**	**ES1705344-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Ethion	563-12-2	0.02	µg/L	<0.02	----	----	----	----
Ethoprophos	13194-48-4	0.01	µg/L	<0.01	----	----	----	----
Etridiazole	2593-15-9	0.5	µg/L	<0.5	----	----	----	----
Fenamiphos	22224-92-6	0.01	µg/L	<0.01	----	----	----	----
Fenarimol	60168-88-9	0.02	µg/L	<0.02	----	----	----	----
Fenchlorphos (Ronnel)	299-84-3	10	µg/L	<10	----	----	----	----
Fenitrothion	122-14-5	2	µg/L	<2	----	----	----	----
Fenoxycarb	79127-80-3	0.1	µg/L	<0.1	----	----	----	----
Fensulfothion	115-90-2	0.01	µg/L	<0.01	----	----	----	----
Fenthion	55-38-9	0.05	µg/L	<0.05	----	----	----	----
Flamprop methyl	52756-25-9	0.1	µg/L	<0.1	----	----	----	----
Fluometuron	2164-17-2	0.01	µg/L	<0.01	----	----	----	----
Flusilazole	85509-19-9	0.02	µg/L	<0.02	----	----	----	----
Formothion	2540-82-1	20	µg/L	<20	----	----	----	----
Fosetyl Aluminium	39148-24-8	10	µg/L	<10	----	----	----	----
Haloxyfop	69806-34-4	0.1	µg/L	<0.1	----	----	----	----
Hexaconazole	79983-71-4	0.02	µg/L	<0.02	----	----	----	----
Hexazinone	51235-04-2	0.02	µg/L	<0.02	----	----	----	----
Imazapyr	94795-74-1	10	µg/L	<10.0	----	----	----	----
Indoxacarb	173584-44-6	0.1	µg/L	<0.1	----	----	----	----
Iodosulfuron methyl	144550-36-7	0.1	µg/L	<0.1	----	----	----	----
Irgarol	28159-98-0	0.002	µg/L	<0.002	----	----	----	----
Isoproturon	34123-59-6	0.1	µg/L	<0.1	----	----	----	----
Malathion	121-75-5	0.02	µg/L	<0.02	----	----	----	----
Metalaxyl	57837-19-1	0.1	µg/L	<0.1	----	----	----	----
Metalaxyl-M	70630-17-0	0.1	µg/L	<0.1	----	----	----	----
Metaldehyde	108-62-3	10	µg/L	<10	----	----	----	----
Methidathion	950-37-8	0.1	µg/L	<0.1	----	----	----	----
Methiocarb	2032-65-7	0.01	µg/L	<0.01	----	----	----	----
Methomyl	16752-77-5	0.01	µg/L	<0.01	----	----	----	----
Metolachlor	51218-45-2	0.01	µg/L	<0.01	----	----	----	----
Metribuzin	21087-64-9	0.02	µg/L	<0.02	----	----	----	----
Mevinphos	7786-34-7	0.02	µg/L	<0.02	----	----	----	----
Molinate	2212-67-1	0.1	µg/L	<0.1	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**POST DREDGING DAM 2 (2) - FILTERED**	**POST DREDGING DAM 2 (2) - TOTAL**	----	----	----
			Client sampling date / time	07-Mar-2017 00:00	07-Mar-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1705344-001**	**ES1705344-002**	--------	--------	--------
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Monocrotophos	6923-22-4	0.02	µg/L	<0.02	----	----	----	----
Myclobutanil	88671-89-0	0.1	µg/L	<0.1	----	----	----	----
Naftalofos	1491-41-4	1	µg/L	<1.0	----	----	----	----
Napropamide	15299-99-7	0.1	µg/L	<0.1	----	----	----	----
Nitralin	4726-14-1	0.1	µg/L	<0.1	----	----	----	----
Norflurazon	27314-13-2	0.1	µg/L	<0.1	----	----	----	----
Novaluron	116714-46-6	0.1	µg/L	<0.1	----	----	----	----
Omethoate	1113-02-6	0.01	µg/L	<0.01	----	----	----	----
Oxamyl	23135-22-0	0.01	µg/L	<0.01	----	----	----	----
Oxyfluorfen	42874-03-3	1	µg/L	<1.0	----	----	----	----
Paclobutrazole	76738-62-0	0.05	µg/L	<0.05	----	----	----	----
Parathion	56-38-2	0.2	µg/L	<0.2	----	----	----	----
Parathion-methyl	298-00-0	0.5	µg/L	<0.5	----	----	----	----
Pebulate	1114-71-2	0.1	µg/L	<0.1	----	----	----	----
Penconazole	66246-88-6	0.01	µg/L	<0.01	----	----	----	----
Pendimethalin	40487-42-1	0.05	µg/L	<0.05	----	----	----	----
Phorate	298-02-2	0.1	µg/L	<0.1	----	----	----	----
Pirimicarb	23103-98-2	0.1	µg/L	<0.1	----	----	----	----
Pirimiphos-ethyl	23505-41-1	0.01	µg/L	<0.01	----	----	----	----
Pirimiphos-methyl	29232-93-7	0.01	µg/L	<0.01	----	----	----	----
Prochloraz	67747-09-5	0.1	µg/L	<0.1	----	----	----	----
Profenofos	41198-08-7	0.01	µg/L	<0.01	----	----	----	----
Promecarb	2631-37-0	0.1	µg/L	<0.1	----	----	----	----
Prometryn	7287-19-6	0.01	µg/L	<0.01	----	----	----	----
Propachlor	1918-16-7	0.1	µg/L	<0.1	----	----	----	----
Propamocarb	24579-73-5	0.1	µg/L	<0.1	----	----	----	----
Propargite	2312-35-8	0.1	µg/L	<0.1	----	----	----	----
Propazine	139-40-2	0.01	µg/L	<0.01	----	----	----	----
Propiconazole	60207-90-1	0.05	µg/L	<0.05	----	----	----	----
Propyzamide	23950-58-5	0.1	µg/L	<0.1	----	----	----	----
Prothiofos	34643-46-4	0.1	µg/L	<0.1	----	----	----	----
Pyraclostrobin	175013-18-0	0.1	µg/L	<0.1	----	----	----	----
Pyrazophos	13457-18-6	0.1	µg/L	<0.1	----	----	----	----
Pyrimethanil	53112-28-0	0.02	µg/L	<0.02	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**POST DREDGING DAM 2 (2) - FILTERED**	**POST DREDGING DAM 2 (2) - TOTAL**	**----**	**----**	**----**
			Client sampling date / time	07-Mar-2017 00:00	07-Mar-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1705344-001**	**ES1705344-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Pyriproxyfen	95737-68-1	0.1	µg/L	<0.1	----	----	----	----
Pyroxsulam	422556-08-9	0.1	µg/L	<0.1	----	----	----	----
Quinclorac	84087-01-4	0.1	µg/L	<0.1	----	----	----	----
Rimsulfuron	122931-48-0	0.1	µg/L	<0.1	----	----	----	----
Siduron	1982-49-6	0.1	µg/L	<0.1	----	----	----	----
Simazine	122-34-9	0.02	µg/L	<0.02	----	----	----	----
Spirotetramat	203313-25-1	0.1	µg/L	<0.1	----	----	----	----
Sulfotep	3689-24-5	0.005	µg/L	<0.005	----	----	----	----
Sulprofos	35400-43-2	0.05	µg/L	<0.05	----	----	----	----
Tebuconazole	107534-96-3	0.01	µg/L	<0.01	----	----	----	----
Tebuthiuron	34014-18-1	0.02	µg/L	<0.02	----	----	----	----
Temephos	3383-96-8	0.02	µg/L	<0.02	----	----	----	----
Terbacil	5902-51-2	0.1	µg/L	<0.1	----	----	----	----
Terbufos	13071-79-9	0.01	µg/L	<0.01	----	----	----	----
Terbuthylazine	5915-41-3	0.01	µg/L	<0.01	----	----	----	----
Terbutryn	886-50-0	0.01	µg/L	<0.01	----	----	----	----
Tetrachlorvinphos	22248-79-9	0.01	µg/L	<0.01	----	----	----	----
Tetraconazole	112281-77-3	0.1	µg/L	<0.1	----	----	----	----
Thiamethoxam	153719-23-4	0.02	µg/L	<0.02	----	----	----	----
Thiobencarb	28249-77-6	0.01	µg/L	<0.01	----	----	----	----
Thiodicarb	59669-26-0	0.01	µg/L	<0.01	----	----	----	----
Thiometon	640-15-3	0.5	µg/L	<0.5	----	----	----	----
Toltrazuril	69004-03-1	0.5	µg/L	<0.5	----	----	----	----
Triadimefon	43121-43-3	0.1	µg/L	<0.1	----	----	----	----
Triadimenol	55219-65-3	0.1	µg/L	<0.1	----	----	----	----
Triazophos	24017-47-8	0.005	µg/L	<0.005	----	----	----	----
Trichlorfon	52-68-6	0.02	µg/L	<0.02	----	----	----	----
Trichloronate	327-98-0	0.5	µg/L	<0.5	----	----	----	----
Trifloxystrobin	141517-21-7	0.1	µg/L	<0.1	----	----	----	----
Trifloxysulfuron-sodium	199119-58-9	0.1	µg/L	<0.1	----	----	----	----
Trifluralin	1582-09-8	10	µg/L	<10.0	----	----	----	----
Trinexapac Ethyl	95266-40-3	1	µg/L	<1	----	----	----	----
Vernolate	1929-77-7	0.1	µg/L	<0.1	----	----	----	----
EP247: Phenolics and Related Compounds								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**POST DREDGING DAM 2 (2) - FILTERED**	**POST DREDGING DAM 2 (2) - TOTAL**	----	----	----
			Client sampling date / time	07-Mar-2017 00:00	07-Mar-2017 00:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1705344-001**	**ES1705344-002**	--------	--------	--------
				Result	Result	----	----	----
EP247: Phenolics and Related Compounds - Continued								
2,4-Dinitrophenol	51-28-5	0.01	µg/L	<0.01	----	----	----	----
2-Methyl-4.6-dinitrophenol	8071-51-0	0.05	µg/L	<0.05	----	----	----	----
4-Nonylphenol (mixture of isomers)	84852-15-3	0.1	µg/L	<0.10	----	----	----	----
Hexachlorophene	70-30-4	0.1	µg/L	<0.10	----	----	----	----
4-Nitrophenol	100-02-7	0.1	µg/L	**0.76**	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.1	µg/L	<0.10	----	----	----	----
Pentachlorophenol	87-86-5	0.1	µg/L	**0.27**	----	----	----	----
Dinoseb	88-85-7	0.1	µg/L	<0.10	----	----	----	----
Dalapon	75-99-0	0.1	µg/L	<0.10	----	----	----	----
Bisphenol-A	80-05-7	0.05	µg/L	**0.32**	----	----	----	----
MW002: Heterotrophic Plate Count								
Heterotrophic Plate Count (22°C)	----	1	CFU/mL	----	**1500**	----	----	----
MW006: Faecal Coliforms & E.coli by MF								
Escherichia coli	----	1	CFU/100mL	----	<1	----	----	----
MW007: Coliforms by MF								
Coliforms	----	1	CFU/100mL	----	<1	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	**18.2**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%	**42.1**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%	**35.6**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	**71.3**	----	----	----	----
Anthracene-d10	1719-06-8	1	%	**77.1**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1	%	**76.1**	----	----	----	----
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	2	%	**15.2**	----	----	----	----
Phenol-d6	13127-88-3	2	%	**23.0**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	2	%	**18.2**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	2	%	**13.2**	----	----	----	----
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	2	%	**59.5**	----	----	----	----
1.2-Dichlorobenzene-D4	2199-69-1	2	%	**53.9**	----	----	----	----
2-Fluorobiphenyl	321-60-8	2	%	**67.5**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**POST DREDGING DAM 2 (2) - FILTERED**	**POST DREDGING DAM 2 (2) - TOTAL**	----	----	----
			Client sampling date / time	07-Mar-2017 00:00	07-Mar-2017 00:00	----	----	----
Compound	CAS Number	LOR	Unit	**ES1705344-001**	**ES1705344-002**	--------	--------	--------
				Result	Result	----	----	----
EP075T: Base/Neutral Extractable Surrogates - Continued								
Anthracene-d10	1719-06-8	2	%	**79.8**	----	----	----	----
4-Terphenyl-d14	1718-51-0	2	%	**76.3**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**94.4**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**95.7**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**97.0**	----	----	----	----
EP094S: Pesticide Surrogate								
DEF	78-48-8	0.5	%	**85.2**	----	----	----	----
EP125S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**90.6**	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	**93.6**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**91.3**	----	----	----	----
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.01	%	**109**	----	----	----	----
EP131T: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	**117**	----	----	----	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**117**	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%	**120**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**114**	----	----	----	----
EP203S: Explosives Surrogate								
o-Dinitrobenzene	528-29-0	1	%	**99.9**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	*CAS Number*	*Recovery Limits (%)* Low	*Recovery Limits (%)* High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	10	117
Phenol-d6	13127-88-3	10	69
2-Chlorophenol-D4	93951-73-6	21	130
2.4.6-Tribromophenol	118-79-6	10	151
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	29	142
1.2-Dichlorobenzene-D4	2199-69-1	24	121
2-Fluorobiphenyl	321-60-8	27	135
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	21	123
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128
EP094S: Pesticide Surrogate			
DEF	78-48-8	42	143
EP125S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	65	127
4-Bromofluorobenzene	460-00-4	68	124
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	14	166
EP131T: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	10	144
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	135
Anthracene-d10	1719-06-8	48	138
4-Terphenyl-d14	1718-51-0	48	144
EP203S: Explosives Surrogate			

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP203S: Explosives Surrogate - Continued			
o-Dinitrobenzene	528-29-0	51	125

CERTIFICATE OF ANALYSIS

Work Order	: **ES1706362**	Page	: 1 of 20
Client	: **BORAL RECYCLING - WIDEMERE**	Laboratory	: Environmental Division Sydney
Contact	: PHILIP PATERSON	Contact	: Customer Services ES
Address	: Boral Recycling Wetherill Park, NSW 2164	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: 02 9604 9101	Telephone	: +61-2-8784 8555
Project	: SURFACE WATER ANALYSIS	Date Samples Received	: 17-Mar-2017 13:05
Order number	: 5724654	Date Analysis Commenced	: 17-Mar-2017
C-O-C number	: ----	Issue Date	: 31-Mar-2017 15:16
Sampler	: Chris V.		
Site	: ----		
Quote number	: SY/662/16 V5		
No. of samples received	: 4		
No. of samples analysed	: 4		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Amanda Conkie	Organic Chemist	Brisbane Organics, Stafford, QLD
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, Springvale, VIC
Raymond Commodore	Instrument Chemist	Sydney Inorganics, Smithfield, NSW
Sarah Axisa	Microbiologist	Sydney Microbiology, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- TOC conducted by ALS Melbourne, NATA accreditation no. 825, site no 13778
- EG093: Samples ES1706362 #001, 003 were run on EG094 method due to low TDS content.
- EP125: Poor matrix spike recovery due to sample matrix effects. This has been confirmed by re-analysis.
- CFU = colony forming unit
- MF = membrane filtration
- Microbiological Comment: HPC results are reported an approximate (~) when the count of colonies on the plate is outside the range of 10 - 300cfu, in accordance with ALS work instruction QWI-MIC/MW002.
- Microbiological Comment: HPC results are reported as estimate (~) when the count of colonies on the plate is outside the range of 10 – 300 cfu, in accordance with ALS work instruction QWI-MIC/MW002. It may be informative to record this fact.

  Microbiological Comment: #1: Membrane filtration results are reported as estimate (~) due to the presence of many non-target organism colonies that may have inhibited the growth of the target organisms on the filter membrane. It may be informative to record this fact.

  Microbiological Comment: #2: Membrane filtration results are reported as estimate (~) due to the growth of bacteria on the filter membrane being counted <10 cfu and/or >100 cfu. It may be informative to record this fact.
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- EP075: Poor surrogate recovery due to sample heterogeneity. Confirmed by re-extraction and re-analysis.
- EP050: The MBAS reported is calculated as LAS, mol wt __342_____.
- Total PAH reported as the sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene and Benzo(g,h,i)perylene.
- EP075: 'Sum of PAH' is the sum of the USEPA 16 priority PAHs
- MW002 is ALS's internal code and is equivalent to AS4276.3.1.
- MW006 is ALS's internal code and is equivalent to AS4276.7.
- MW007 is ALS's internal code and is equivalent to AS4276.5.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Prospect Creek Upstream (Filtered)**	**Prospect Creek Upstream (Total)**	**Post Dredge Dam 2 - #3 (Filtered)**	**Post Dredge Dam 2 - #3 (Total)**	----
			Client sampling date / time	17-Mar-2017 11:05	17-Mar-2017 11:05	17-Mar-2017 11:30	17-Mar-2017 11:30	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706362-001**	**ES1706362-002**	**ES1706362-003**	**ES1706362-004**	--------
				Result	Result	Result	Result	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	----	**7.82**	----	**10.4**	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	----	**524**	----	**512**	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	----	<5	----	**38**	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	----	**10.2**	----	**31.1**	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	**84**	----	**30**	----	----
EA075: Redox Potential								
Redox Potential	----	0.1	mV	**186**	----	**76.0**	----	----
pH Redox	----	0.01	pH Unit	**7.34**	----	**11.1**	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**47**	----	**73**	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**64**	----	**34**	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**14**	----	**12**	----	----
Magnesium	7439-95-4	1	mg/L	**12**	----	<1	----	----
Sodium	7440-23-5	1	mg/L	**72**	----	**67**	----	----
Potassium	7440-09-7	1	mg/L	**5**	----	**35**	----	----
EG020F: Dissolved Metals by ICP-MS								
Gallium	7440-55-3	0.001	mg/L	<0.001	----	**0.004**	----	----
Lanthanum	7439-91-0	0.001	mg/L	<0.001	----	<0.001	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.00004	mg/L	<0.00004	----	<0.00004	----	----
EG049G LL-F: Dissolved Trivalent Chromium - Low Level								
Trivalent Chromium	16065-83-1	0.001	mg/L	<0.001	----	<0.001	----	----
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level								
Hexavalent Chromium	18540-29-9	0.001	mg/L	<0.001	----	**0.023**	----	----
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	**12.0**	----	**8.32**	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Prospect Creek Upstream (Filtered)**	**Prospect Creek Upstream (Total)**	**Post Dredge Dam 2 - #3 (Filtered)**	**Post Dredge Dam 2 - #3 (Total)**	----
			Client sampling date / time	17-Mar-2017 11:05	17-Mar-2017 11:05	17-Mar-2017 11:30	17-Mar-2017 11:30	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706362-001**	**ES1706362-002**	**ES1706362-003**	**ES1706362-004**	--------
				Result	Result	Result	Result	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS - Continued								
Aluminium	7429-90-5	5	µg/L	**203**	----	**1900**	----	----
Antimony	7440-36-0	0.5	µg/L	<0.5	----	**1.5**	----	----
Arsenic	7440-38-2	0.5	µg/L	**0.6**	----	**1.4**	----	----
Barium	7440-39-3	1	µg/L	**52**	----	**12**	----	----
Beryllium	7440-41-7	0.1	µg/L	<0.1	----	<0.1	----	----
Bismuth	7440-69-9	0.1	µg/L	<0.1	----	<0.1	----	----
Boron	7440-42-8	100	µg/L	<100	----	<100	----	----
Cadmium	7440-43-9	0.2	µg/L	<0.2	----	<0.2	----	----
Chromium	7440-47-3	0.5	µg/L	**0.9**	----	**22.4**	----	----
Cobalt	7440-48-4	0.2	µg/L	**0.6**	----	**1.5**	----	----
Copper	7440-50-8	1	µg/L	**7**	----	**12**	----	----
Iron	7439-89-6	5	µg/L	**615**	----	**32**	----	----
Lead	7439-92-1	0.2	µg/L	**0.5**	----	**0.9**	----	----
Manganese	7439-96-5	0.5	µg/L	**69.5**	----	<0.5	----	----
Molybdenum	7439-98-7	0.1	µg/L	**1.6**	----	**16.6**	----	----
Nickel	7440-02-0	0.5	µg/L	**4.7**	----	**2.3**	----	----
Selenium	7782-49-2	2	µg/L	<2	----	<2	----	----
Silver	7440-22-4	0.1	µg/L	<0.1	----	<0.1	----	----
Strontium	7440-24-6	10	µg/L	**120**	----	**138**	----	----
Thallium	7440-28-0	0.1	µg/L	<0.1	----	<0.1	----	----
Tin	7440-31-5	5	µg/L	<5	----	<5	----	----
Uranium	7440-61-1	0.1	µg/L	**0.2**	----	<0.1	----	----
Vanadium	7440-62-2	0.5	µg/L	**1.8**	----	**43.8**	----	----
Zinc	7440-66-6	5	µg/L	**10**	----	<5	----	----
EK010-1: Chlorine								
Total Residual Chlorine	----	0.02	mg/L	**0.02**	----	<0.02	----	----
EK025SF: Free CN by Segmented Flow Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	----	<0.004	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	----	**0.007**	----	----
EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser								
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	----	<0.004	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	----	<0.01	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Prospect Creek Upstream (Filtered)**	**Prospect Creek Upstream (Total)**	**Post Dredge Dam 2 - #3 (Filtered)**	**Post Dredge Dam 2 - #3 (Total)**	----
			Client sampling date / time	17-Mar-2017 11:05	17-Mar-2017 11:05	17-Mar-2017 11:30	17-Mar-2017 11:30	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706362-001**	**ES1706362-002**	**ES1706362-003**	**ES1706362-004**	--------
				Result	Result	Result	Result	----
EK084: Un-ionized Hydrogen Sulfide								
Unionized Hydrogen Sulfide	----	0.1	mg/L	<0.1	----	<0.1	----	----
EK255A: Ammonia								
Ammonia as N	7664-41-7	0.005	mg/L	**0.042**	----	**0.152**	----	----
EK257A: Nitrite								
Nitrite as N	14797-65-0	0.002	mg/L	**0.030**	----	**2.46**	----	----
EK258A: Nitrate								
Nitrate as N	14797-55-8	0.002	mg/L	**0.129**	----	**2.24**	----	----
EK259A: Nitrite and Nitrate (NOx)								
Nitrite + Nitrate as N	----	0.002	mg/L	**0.159**	----	**4.70**	----	----
EK261A: Total Kjeldahl Nitrogen								
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	**0.93**	----	**1.59**	----	----
EK262A: Total Nitrogen								
Total Nitrogen as N	----	0.01	mg/L	**1.09**	----	**6.29**	----	----
EK267A: Total Phosphorus (Persulfate Digestion)								
Total Phosphorus as P	----	0.005	mg/L	**0.147**	----	**0.143**	----	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	**20**	----	**11**	----	----
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m^3	<1	----	<1	----	----
EP020: Oil and Grease (O&G)								
Oil & Grease	----	5	mg/L	----	<5	----	<5	----
EP026SP: Chemical Oxygen Demand (Spectrophotometric)								
Chemical Oxygen Demand	----	10	mg/L	**42**	----	**21**	----	----
EP030: Biochemical Oxygen Demand (BOD)								
Biochemical Oxygen Demand	----	2	mg/L	<2	----	<2	----	----
EP050: Anionic Surfactants as MBAS								
Anionic Surfactants as MBAS	----	0.1	mg/L	**0.1**	----	<0.1	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1	µg/L	<1.0	----	<1.0	----	----
2-Chlorophenol	95-57-8	1	µg/L	<1.0	----	<1.0	----	----
2-Methylphenol	95-48-7	1	µg/L	<1.0	----	<1.0	----	----
3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	----	<2.0	----	----
2-Nitrophenol	88-75-5	1	µg/L	<1.0	----	<1.0	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Prospect Creek Upstream (Filtered)**	**Prospect Creek Upstream (Total)**	**Post Dredge Dam 2 - #3 (Filtered)**	**Post Dredge Dam 2 - #3 (Total)**	----
			Client sampling date / time	17-Mar-2017 11:05	17-Mar-2017 11:05	17-Mar-2017 11:30	17-Mar-2017 11:30	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706362-001**	**ES1706362-002**	**ES1706362-003**	**ES1706362-004**	--------
				Result	Result	Result	Result	----
EP075(SIM)A: Phenolic Compounds - Continued								
2.4-Dimethylphenol	105-67-9	1	µg/L	<1.0	----	<1.0	----	----
2.4-Dichlorophenol	120-83-2	1	µg/L	<1.0	----	<1.0	----	----
2.6-Dichlorophenol	87-65-0	1	µg/L	<1.0	----	<1.0	----	----
4-Chloro-3-methylphenol	59-50-7	1	µg/L	<1.0	----	<1.0	----	----
2.4.6-Trichlorophenol	88-06-2	1	µg/L	<1.0	----	<1.0	----	----
2.4.5-Trichlorophenol	95-95-4	1	µg/L	<1.0	----	<1.0	----	----
Pentachlorophenol	87-86-5	2	µg/L	<2.0	----	<2.0	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	----	<1.0	----	----
Acenaphthylene	208-96-8	1	µg/L	<1.0	----	<1.0	----	----
Acenaphthene	83-32-9	1	µg/L	<1.0	----	<1.0	----	----
Fluorene	86-73-7	1	µg/L	<1.0	----	<1.0	----	----
Phenanthrene	85-01-8	1	µg/L	<1.0	----	<1.0	----	----
Anthracene	120-12-7	1	µg/L	<1.0	----	<1.0	----	----
Fluoranthene	206-44-0	1	µg/L	<1.0	----	<1.0	----	----
Pyrene	129-00-0	1	µg/L	<1.0	----	<1.0	----	----
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	----	<1.0	----	----
Chrysene	218-01-9	1	µg/L	<1.0	----	<1.0	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	----	<1.0	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	----	<1.0	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	----	<1.0	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	----	<1.0	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	----	<1.0	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	----	<0.5	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	----	<0.5	----	----
EP075C: Phthalate Esters								
Dimethyl phthalate	131-11-3	2	µg/L	<2	----	<2	----	----
Diethyl phthalate	84-66-2	2	µg/L	<2	----	<2	----	----
Di-n-butyl phthalate	84-74-2	2	µg/L	<2	----	<2	----	----
Butyl benzyl phthalate	85-68-7	2	µg/L	<2	----	<2	----	----
bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L	<10	----	<10	----	----
Di-n-octylphthalate	117-84-0	2	µg/L	<2	----	<2	----	----
EP075G: Chlorinated Hydrocarbons								

Analytical Results

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

			Client sample ID	**Prospect Creek Upstream (Filtered)**	**Prospect Creek Upstream (Total)**	**Post Dredge Dam 2 - #3 (Filtered)**	**Post Dredge Dam 2 - #3 (Total)**	**----**
			Client sampling date / time	17-Mar-2017 11:05	17-Mar-2017 11:05	17-Mar-2017 11:30	17-Mar-2017 11:30	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706362-001**	**ES1706362-002**	**ES1706362-003**	**ES1706362-004**	**--------**
				Result	Result	Result	Result	----
EP075G: Chlorinated Hydrocarbons - Continued								
1.3-Dichlorobenzene	541-73-1	2	µg/L	<2	----	<2	----	----
1.4-Dichlorobenzene	106-46-7	2	µg/L	<2	----	<2	----	----
1.2-Dichlorobenzene	95-50-1	2	µg/L	<2	----	<2	----	----
Hexachloroethane	67-72-1	2	µg/L	<2	----	<2	----	----
1.2.4-Trichlorobenzene	120-82-1	2	µg/L	<2	----	<2	----	----
Hexachloropropylene	1888-71-7	2	µg/L	<2	----	<2	----	----
Hexachlorobutadiene	87-68-3	2	µg/L	<2	----	<2	----	----
Hexachlorocyclopentadiene	77-47-4	10	µg/L	<10	----	<10	----	----
Pentachlorobenzene	608-93-5	2	µg/L	<2	----	<2	----	----
Hexachlorobenzene (HCB)	118-74-1	4	µg/L	<4	----	<4	----	----
EP075H: Anilines and Benzidines								
Aniline	62-53-3	2	µg/L	<2	----	<2	----	----
4-Chloroaniline	106-47-8	2	µg/L	<2	----	<2	----	----
2-Nitroaniline	88-74-4	4	µg/L	<4	----	<4	----	----
3-Nitroaniline	99-09-2	4	µg/L	<4	----	<4	----	----
Dibenzofuran	132-64-9	2	µg/L	<2	----	<2	----	----
4-Nitroaniline	100-01-6	2	µg/L	<2	----	<2	----	----
Carbazole	86-74-8	2	µg/L	<2	----	<2	----	----
3.3`-Dichlorobenzidine	91-94-1	2	µg/L	<2	----	<2	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	**320**	----	<20	----	----
C10 - C14 Fraction	----	50	µg/L	**80**	----	**80**	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	<100	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	<50	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	**80**	----	**80**	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	**320**	----	<20	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	**200**	----	<20	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	<100	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	<100	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	<100	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	----	<100	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Prospect Creek Upstream (Filtered)**	**Prospect Creek Upstream (Total)**	**Post Dredge Dam 2 - #3 (Filtered)**	**Post Dredge Dam 2 - #3 (Total)**	----
			Client sampling date / time	17-Mar-2017 11:05	17-Mar-2017 11:05	17-Mar-2017 11:30	17-Mar-2017 11:30	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706362-001**	**ES1706362-002**	**ES1706362-003**	**ES1706362-004**	--------
				Result	Result	Result	Result	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued								
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	----	<100	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	<1	----	----
Toluene	108-88-3	2	µg/L	**115**	----	<2	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	<2	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	<2	----	----
^ **Total Xylenes**	1330-20-7	2	µg/L	<2	----	<2	----	----
^ **Sum of BTEX**	----	1	µg/L	**115**	----	<1	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	<5	----	----
EP094A: Synthetic Pyrethroids								
Bioresmethrin	28434-01-07	0.5	µg/L	<0.5	----	<0.5	----	----
Bifenthrin	82657-04-3	0.5	µg/L	<0.5	----	<0.5	----	----
Phenothrin	26002-80-2	0.5	µg/L	<0.5	----	<0.5	----	----
Lambda-cyhalothrin	68085-85-8	0.5	µg/L	<0.5	----	<0.5	----	----
Permethrin	52645-53-1	0.5	µg/L	<0.5	----	<0.5	----	----
Cyfluthrin	68359-37-5	0.5	µg/L	<0.5	----	<0.5	----	----
Cypermethrin	52315-07-8	0.5	µg/L	<0.5	----	<0.5	----	----
Fenvalverate & Esfenvalerate	51630-58-1/66230-04-	0.5	µg/L	<0.5	----	<0.5	----	----
Deltamethrin & Tralomethrin	62229-77-0/66841-25-	0.5	µg/L	<0.5	----	<0.5	----	----
Allethrin	584-79-2	0.5	µg/L	<0.5	----	<0.5	----	----
Transfluthrin	118712-89-3	0.5	µg/L	<0.5	----	<0.5	----	----
Tau-fluvalinate	102851-06-9	0.5	µg/L	<0.5	----	<0.5	----	----
Tetramethrin	68085-85-8	0.5	µg/L	<0.5	----	<0.5	----	----
EP094B: Synergist								
Piperonyl Butoxide	63993-73-7	0.5	µg/L	<0.5	----	<0.5	----	----
EP117: Alcohols								
Ethanol	64-17-5	50	µg/L	<50	----	<50	----	----
Isopropanol	67-63-0	50	µg/L	**94**	----	**91**	----	----
n-Propanol	71-23-8	50	µg/L	<50	----	<50	----	----
Isobutanol	78-83-1	50	µg/L	<50	----	<50	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Prospect Creek Upstream (Filtered)**	**Prospect Creek Upstream (Total)**	**Post Dredge Dam 2 - #3 (Filtered)**	**Post Dredge Dam 2 - #3 (Total)**	----
			Client sampling date / time	17-Mar-2017 11:05	17-Mar-2017 11:05	17-Mar-2017 11:30	17-Mar-2017 11:30	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706362-001**	**ES1706362-002**	**ES1706362-003**	**ES1706362-004**	--------
				Result	Result	Result	Result	----
EP117: Alcohols - Continued								
n-Butanol	71-36-3	50	µg/L	<50	----	<50	----	----
EP125A: Monocyclic Aromatic Hydrocarbons								
Benzene	71-43-2	0.05	µg/L	<0.05	----	<0.05	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	----	<0.5	----	----
Ethylbenzene	100-41-4	0.05	µg/L	**0.06**	----	<0.05	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.05	µg/L	**0.15**	----	**0.07**	----	----
Styrene	100-42-5	0.05	µg/L	<0.05	----	<0.05	----	----
ortho-Xylene	95-47-6	0.05	µg/L	**0.13**	----	<0.05	----	----
1.3.5-Trimethylbenzene	108-67-8	0.05	µg/L	<0.05	----	<0.05	----	----
1.2.4-Trimethylbenzene	95-63-6	0.05	µg/L	**0.05**	----	<0.05	----	----
EP125D: Fumigants								
1.2-Dichloropropane	78-87-5	0.1	µg/L	<0.1	----	<0.1	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.1	µg/L	<0.1	----	<0.1	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.1	µg/L	<0.1	----	<0.1	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.1	µg/L	<0.1	----	<0.1	----	----
EP125E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	0.5	µg/L	<0.5	----	<0.5	----	----
Vinyl chloride	75-01-4	0.3	µg/L	<0.3	----	<0.3	----	----
Bromomethane	74-83-9	0.5	µg/L	<0.5	----	<0.5	----	----
Chloroethane	75-00-3	0.5	µg/L	<0.5	----	<0.5	----	----
Trichlorofluoromethane	75-69-4	0.5	µg/L	<0.5	----	<0.5	----	----
1.1-Dichloroethene	75-35-4	0.1	µg/L	<0.1	----	<0.1	----	----
Dichloromethane	75-09-2	1	µg/L	**1.4**	----	<1.0	----	----
trans-1.2-Dichloroethene	156-60-5	0.1	µg/L	<0.1	----	<0.1	----	----
1.1-Dichloroethane	75-34-3	0.1	µg/L	<0.1	----	<0.1	----	----
cis-1.2-Dichloroethene	156-59-2	0.1	µg/L	<0.1	----	<0.1	----	----
Bromochloromethane	74-97-5	0.5	µg/L	<0.5	----	<0.5	----	----
1.2-Dichloroethane	107-06-2	0.1	µg/L	<0.1	----	<0.1	----	----
1.1.1-Trichloroethane	71-55-6	0.1	µg/L	<0.1	----	<0.1	----	----
Carbon Tetrachloride	56-23-5	0.05	µg/L	<0.05	----	<0.05	----	----
Trichloroethene	79-01-6	0.05	µg/L	<0.05	----	<0.05	----	----
Tetrachloroethene	127-18-4	0.05	µg/L	<0.05	----	<0.05	----	----
Hexachlorobutadiene	87-68-3	0.04	µg/L	<0.04	----	<0.04	----	----
EP125F: Halogenated Aromatic Compounds								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	Prospect Creek Upstream (Filtered)	Prospect Creek Upstream (Total)	Post Dredge Dam 2 - #3 (Filtered)	Post Dredge Dam 2 - #3 (Total)	----
			Client sampling date / time	17-Mar-2017 11:05	17-Mar-2017 11:05	17-Mar-2017 11:30	17-Mar-2017 11:30	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706362-001**	**ES1706362-002**	**ES1706362-003**	**ES1706362-004**	**--------**
				Result	Result	Result	Result	----
EP125F: Halogenated Aromatic Compounds - Continued								
Chlorobenzene	108-90-7	0.1	µg/L	<0.10	----	**0.55**	----	----
Bromobenzene	108-86-1	0.1	µg/L	<0.10	----	<0.10	----	----
Benzylchloride	100-44-7	0.2	µg/L	<0.2	----	<0.2	----	----
1.3-Dichlorobenzene	541-73-1	0.1	µg/L	<0.10	----	<0.10	----	----
1.4-Dichlorobenzene	106-46-7	0.1	µg/L	<0.10	----	<0.10	----	----
1.2-Dichlorobenzene	95-50-1	0.1	µg/L	<0.10	----	<0.10	----	----
2-Chlorotoluene	95-49-8	0.1	µg/L	<0.1	----	<0.1	----	----
4-Chlorotoluene	106-43-4	0.1	µg/L	<0.1	----	<0.1	----	----
1.2.4-Trichlorobenzene	120-82-1	0.1	µg/L	<0.1	----	<0.1	----	----
1.2.3-Trichlorobenzene	87-61-6	0.1	µg/L	<0.1	----	<0.1	----	----
^ **Trichlorobenzenes (Sum)**	----	0.1	µg/L	<0.1	----	<0.1	----	----
EP125G: Trihalomethanes								
Chloroform	67-66-3	0.1	µg/L	<0.10	----	**0.10**	----	----
Bromodichloromethane	75-27-4	0.1	µg/L	<0.10	----	<0.10	----	----
Dibromochloromethane	124-48-1	0.1	µg/L	<0.10	----	<0.10	----	----
Bromoform	75-25-2	0.1	µg/L	<0.10	----	<0.10	----	----
^ **Total Trihalomethanes**	----	0.1	µg/L	<0.10	----	**0.10**	----	----
EP125H: Naphthalene								
Naphthalene	91-20-3	0.05	µg/L	<0.05	----	**0.14**	----	----
EP125L: Methyl t-butyl ether								
Methyl tert-butyl ether (MTBE)	1634-04-4	0.1	µg/L	<0.1	----	<0.1	----	----
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.01	µg/L	<0.010	----	<0.010	----	----
alpha-BHC	319-84-6	0.01	µg/L	<0.010	----	<0.010	----	----
beta-BHC	319-85-7	0.01	µg/L	<0.010	----	<0.010	----	----
delta-BHC	319-86-8	0.01	µg/L	<0.010	----	<0.010	----	----
4.4`-DDD	72-54-8	0.01	µg/L	<0.010	----	<0.010	----	----
4.4`-DDE	72-55-9	0.01	µg/L	<0.010	----	<0.010	----	----
4.4`-DDT	50-29-3	0.01	µg/L	<0.010	----	<0.010	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.01	µg/L	<0.010	----	<0.010	----	----
Dieldrin	60-57-1	0.01	µg/L	<0.010	----	<0.010	----	----
alpha-Endosulfan	959-98-8	0.01	µg/L	<0.010	----	<0.010	----	----
beta-Endosulfan	33213-65-9	0.01	µg/L	<0.010	----	<0.010	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Prospect Creek Upstream (Filtered)**	**Prospect Creek Upstream (Total)**	**Post Dredge Dam 2 - #3 (Filtered)**	**Post Dredge Dam 2 - #3 (Total)**	----
			Client sampling date / time	17-Mar-2017 11:05	17-Mar-2017 11:05	17-Mar-2017 11:30	17-Mar-2017 11:30	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706362-001**	**ES1706362-002**	**ES1706362-003**	**ES1706362-004**	--------
				Result	Result	Result	Result	----
EP131A: Organochlorine Pesticides - Continued								
Endosulfan sulfate	1031-07-8	0.01	µg/L	<0.010	----	<0.010	----	----
^ **Endosulfan (sum)**	115-29-7	0.01	µg/L	<0.010	----	<0.010	----	----
Endrin	72-20-8	0.01	µg/L	<0.010	----	<0.010	----	----
Endrin aldehyde	7421-93-4	0.01	µg/L	<0.010	----	<0.010	----	----
Endrin ketone	53494-70-5	0.01	µg/L	<0.010	----	<0.010	----	----
Heptachlor	76-44-8	0.005	µg/L	<0.005	----	<0.005	----	----
Heptachlor epoxide	1024-57-3	0.01	µg/L	<0.010	----	<0.010	----	----
Hexachlorobenzene (HCB)	118-74-1	0.01	µg/L	<0.010	----	<0.010	----	----
gamma-BHC	58-89-9	0.01	µg/L	<0.010	----	<0.010	----	----
Methoxychlor	72-43-5	0.01	µg/L	<0.010	----	<0.010	----	----
cis-Chlordane	5103-71-9	0.01	µg/L	<0.010	----	<0.010	----	----
trans-Chlordane	5103-74-2	0.01	µg/L	<0.010	----	<0.010	----	----
^ **Total Chlordane (sum)**	----	0.01	µg/L	<0.010	----	<0.010	----	----
Oxychlordane	27304-13-8	0.01	µg/L	<0.010	----	<0.010	----	----
EP131B: Polychlorinated Biphenyls (as Aroclors)								
Total Polychlorinated biphenyls	----	0.1	µg/L	<0.10	----	<0.10	----	----
Aroclor 1016	12674-11-2	0.1	µg/L	<0.10	----	<0.10	----	----
Aroclor 1221	11104-28-2	0.1	µg/L	<0.10	----	<0.10	----	----
Aroclor 1232	11141-16-5	0.1	µg/L	<0.10	----	<0.10	----	----
Aroclor 1242	53469-21-9	0.1	µg/L	<0.10	----	<0.10	----	----
Aroclor 1248	12672-29-6	0.1	µg/L	<0.10	----	<0.10	----	----
Aroclor 1254	11097-69-1	0.1	µg/L	<0.10	----	<0.10	----	----
Aroclor 1260	11096-82-5	0.1	µg/L	<0.10	----	<0.10	----	----
EP132C: Chlorinated Naphthalenes								
1-Chloronaphthalene	90-13-1	0.1	µg/L	<0.1	----	<0.1	----	----
2-Chloronaphthalene	91-58-7	0.1	µg/L	<0.1	----	<0.1	----	----
^ **Chloronaphthalenes (1- + 2-)**	----	0.1	µg/L	<0.1	----	<0.1	----	----
EP203A: Explosives								
HMX	2691-41-0	1	µg/L	<1.0	----	<1.0	----	----
RDX	----	1	µg/L	<1.0	----	<1.0	----	----
1.3.5-Trinitrobenzene	99-35-4	1	µg/L	<1.0	----	<1.0	----	----
1.3-Dinitrobenzene	99-65-0	1	µg/L	<1.0	----	<1.0	----	----
Tetryl	479-45-8	1	µg/L	<1.0	----	<1.0	----	----
2.4.6-TNT	118-96-7	1	µg/L	<1.0	----	<1.0	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Prospect Creek Upstream (Filtered)**	**Prospect Creek Upstream (Total)**	**Post Dredge Dam 2 - #3 (Filtered)**	**Post Dredge Dam 2 - #3 (Total)**	**----**
			Client sampling date / time	17-Mar-2017 11:05	17-Mar-2017 11:05	17-Mar-2017 11:30	17-Mar-2017 11:30	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706362-001**	**ES1706362-002**	**ES1706362-003**	**ES1706362-004**	**--------**
				Result	Result	Result	Result	----
EP203A: Explosives - Continued								
4-Amino.2.6-DNT	19406-51-0	1	µg/L	<1.0	----	<1.0	----	----
2-Amino-4.6-DNT	35572-78-2	1	µg/L	<1.0	----	<1.0	----	----
4-& 2-AM-DNT(Isomeric Mixture)	----	1	µg/L	<1.0	----	<1.0	----	----
2.4-Dinitrotoluene	121-14-2	1	µg/L	<1.0	----	<1.0	----	----
2.6-Dinitrotoluene	606-20-2	1	µg/L	<1.0	----	<1.0	----	----
2.4-& 2.6-DNT(Isomeric Mixture)	51-28-5/606-20-2	1	µg/L	<1.0	----	<1.0	----	----
Nitrobenzene	98-95-3	1	µg/L	<1.0	----	<1.0	----	----
2-Nitrotoluene	88-72-2	1	µg/L	<1.0	----	<1.0	----	----
3-Nitrotoluene	99-08-1	1	µg/L	<1.0	----	<1.0	----	----
4-Nitrotoluene	99-99-0	1	µg/L	<1.0	----	<1.0	----	----
Nitroglycerine	55-63-0	5	µg/L	<5	----	<5	----	----
PETN	78-11-5	5	µg/L	<5	----	<5	----	----
EP234: Multiresidue Pesticides (ESI Positive)								
3-Hydroxy Carbofuran	16655-82-6	0.02	µg/L	<0.02	----	<0.02	----	----
Abamectin	71751-41-2	0.1	µg/L	<0.1	----	<0.1	----	----
Acephate	30560-19-1	0.5	µg/L	<0.5	----	<0.5	----	----
Alachlor	15972-60-8	0.1	µg/L	<0.1	----	<0.1	----	----
Aldicarb	116-06-3	0.05	µg/L	<0.05	----	<0.05	----	----
Ametryn	834-12-8	0.01	µg/L	<0.01	----	<0.01	----	----
Aminopyralid	150114-71-9	0.1	µg/L	<0.1	----	<0.1	----	----
Amitraz	33089-61-1	100	µg/L	<100	----	<100	----	----
Atrazine	1912-24-9	0.01	µg/L	<0.01	----	<0.01	----	----
Atrazine-desethyl	6190-65-4	0.1	µg/L	<0.1	----	<0.1	----	----
Atrazine-desisopropyl	1007-28-9	0.1	µg/L	<0.1	----	<0.1	----	----
Azinphos-ethyl	2642-71-9	0.02	µg/L	<0.02	----	<0.02	----	----
Azinphos-methyl	86-50-0	0.02	µg/L	<0.02	----	<0.02	----	----
Azoxystrobin	131860-33-8	0.1	µg/L	<0.1	----	<0.1	----	----
Bendiocarb	22781-23-3	0.1	µg/L	<0.10	----	<0.10	----	----
Benomyl	17804-35-2	0.01	µg/L	<0.01	----	**0.38**	----	----
Bensulfuron methyl	83055-99-6	0.1	µg/L	<0.1	----	<0.1	----	----
Bensulide	741-58-2	0.1	µg/L	<0.1	----	<0.1	----	----
Boscalid	188425-85-6	0.1	µg/L	<0.1	----	<0.1	----	----
Bromacil	314-40-9	0.02	µg/L	<0.02	----	<0.02	----	----
Bromophos-ethyl	4824-78-6	0.1	µg/L	<0.10	----	<0.10	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	Prospect Creek Upstream (Filtered)	Prospect Creek Upstream (Total)	Post Dredge Dam 2 - #3 (Filtered)	Post Dredge Dam 2 - #3 (Total)	----
			Client sampling date / time	17-Mar-2017 11:05	17-Mar-2017 11:05	17-Mar-2017 11:30	17-Mar-2017 11:30	----
Compound	CAS Number	LOR	Unit	ES1706362-001	ES1706362-002	ES1706362-003	ES1706362-004	--------
				Result	Result	Result	Result	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Butachlor	23184-66-9	0.1	µg/L	<0.1	----	<0.1	----	----
Carbaryl	63-25-2	0.01	µg/L	<0.01	----	<0.01	----	----
Carbendazim (Thiophanate methyl)	10605-21-7	0.1	µg/L	<0.1	----	**0.4**	----	----
Carbofenothion	786-19-6	0.02	µg/L	<0.02	----	<0.02	----	----
Carbofuran	1563-66-2	0.01	µg/L	<0.01	----	<0.01	----	----
Carboxin	5234-68-4	0.1	µg/L	<0.1	----	<0.1	----	----
Carfentrazone-ethyl	128639-02-1	0.1	µg/L	<0.1	----	<0.1	----	----
Chlorantraniliprole	500008-45-7	0.1	µg/L	<0.1	----	<0.1	----	----
Chlorfenvinphos	470-90-6	0.02	µg/L	<0.02	----	<0.02	----	----
Chloroxuron	1982-47-4	0.1	µg/L	<0.1	----	<0.1	----	----
Chlorpyrifos	2921-88-2	0.02	µg/L	<0.02	----	<0.02	----	----
Chlorpyrifos-methyl	5598-13-0	0.1	µg/L	<0.2	----	<0.2	----	----
Chlorsulfuron	64902-72-3	0.2	µg/L	<0.2	----	<0.2	----	----
Coumaphos	56-72-4	0.01	µg/L	<0.01	----	<0.01	----	----
Cyanazine	21725-46-2	0.02	µg/L	<0.02	----	<0.02	----	----
Cyproconazole	94361-06-5	0.02	µg/L	<0.02	----	<0.02	----	----
Cyprodinil	121552-61-2	0.01	µg/L	<0.01	----	<0.01	----	----
Cyromazine	66215-27-8	0.05	µg/L	<0.05	----	<0.05	----	----
Demeton-O	298-03-0	0.02	µg/L	<0.02	----	<0.02	----	----
Demeton-O & Demeton-S	298-03-3/126-75-0	0.02	µg/L	<0.02	----	<0.02	----	----
Demeton-S	126-75-0	0.02	µg/L	<0.02	----	<0.02	----	----
Demeton-S-methyl	919-86-8	0.02	µg/L	<0.02	----	<0.02	----	----
Diazinon	333-41-5	0.01	µg/L	<0.01	----	<0.01	----	----
Dichlobenil	1194-65-6	0.1	µg/L	<0.1	----	<0.1	----	----
Dichlorvos	62-73-7	0.2	µg/L	<0.20	----	<0.20	----	----
Diclofop-methyl	51338-27-3	0.05	µg/L	<0.05	----	<0.05	----	----
Difenoconazole	119446-68-3	0.02	µg/L	<0.02	----	<0.02	----	----
Diflubenzuron	35367-38-5	0.1	µg/L	<0.1	----	<0.1	----	----
Dimethoate	60-51-5	0.02	µg/L	<0.02	----	<0.02	----	----
Diphenamid	957-51-7	0.1	µg/L	<0.1	----	<0.1	----	----
Disulfoton	298-04-4	0.05	µg/L	<0.05	----	<0.05	----	----
Diuron	330-54-1	0.02	µg/L	<0.02	----	<0.02	----	----
EPN	2104-64-5	0.05	µg/L	<0.05	----	<0.05	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Prospect Creek Upstream (Filtered)**	**Prospect Creek Upstream (Total)**	**Post Dredge Dam 2 - #3 (Filtered)**	**Post Dredge Dam 2 - #3 (Total)**	**----**
			Client sampling date / time	17-Mar-2017 11:05	17-Mar-2017 11:05	17-Mar-2017 11:30	17-Mar-2017 11:30	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706362-001**	**ES1706362-002**	**ES1706362-003**	**ES1706362-004**	**--------**
				Result	Result	Result	Result	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
EPTC	759-94-4	0.1	µg/L	<0.1	----	<0.1	----	----
Ethion	563-12-2	0.02	µg/L	<0.02	----	<0.02	----	----
Ethoprophos	13194-48-4	0.01	µg/L	<0.01	----	<0.01	----	----
Etridiazole	2593-15-9	0.5	µg/L	<0.5	----	<0.5	----	----
Fenamiphos	22224-92-6	0.01	µg/L	<0.01	----	<0.01	----	----
Fenarimol	60168-88-9	0.02	µg/L	<0.02	----	<0.02	----	----
Fenchlorphos (Ronnel)	299-84-3	10	µg/L	<10	----	<10	----	----
Fenitrothion	122-14-5	2	µg/L	<2	----	<2	----	----
Fenoxycarb	79127-80-3	0.1	µg/L	<0.1	----	<0.1	----	----
Fensulfothion	115-90-2	0.01	µg/L	<0.01	----	<0.01	----	----
Fenthion	55-38-9	0.05	µg/L	<0.05	----	<0.05	----	----
Flamprop methyl	52756-25-9	0.1	µg/L	<0.1	----	<0.1	----	----
Fluometuron	2164-17-2	0.01	µg/L	<0.01	----	<0.01	----	----
Flusilazole	85509-19-9	0.02	µg/L	<0.02	----	<0.02	----	----
Formothion	2540-82-1	20	µg/L	<20	----	<20	----	----
Fosetyl Aluminium	39148-24-8	10	µg/L	<10	----	<10	----	----
Haloxyfop	69806-34-4	0.1	µg/L	<0.1	----	<0.1	----	----
Hexaconazole	79983-71-4	0.02	µg/L	<0.02	----	<0.02	----	----
Hexazinone	51235-04-2	0.02	µg/L	<0.02	----	<0.02	----	----
Imazapyr	94795-74-1	10	µg/L	<10.0	----	<10.0	----	----
Indoxacarb	173584-44-6	0.1	µg/L	<0.1	----	<0.1	----	----
Iodosulfuron methyl	144550-36-7	0.1	µg/L	<0.1	----	<0.1	----	----
Irgarol	28159-98-0	0.002	µg/L	<0.002	----	**0.002**	----	----
Isoproturon	34123-59-6	0.1	µg/L	<0.1	----	<0.1	----	----
Malathion	121-75-5	0.02	µg/L	<0.02	----	<0.02	----	----
Metalaxyl	57837-19-1	0.1	µg/L	<0.1	----	<0.1	----	----
Metalaxyl-M	70630-17-0	0.1	µg/L	<0.1	----	<0.1	----	----
Metaldehyde	108-62-3	10	µg/L	<10	----	<10	----	----
Methidathion	950-37-8	0.1	µg/L	<0.1	----	<0.1	----	----
Methiocarb	2032-65-7	0.01	µg/L	<0.01	----	<0.01	----	----
Methomyl	16752-77-5	0.01	µg/L	<0.01	----	<0.01	----	----
Metolachlor	51218-45-2	0.01	µg/L	<0.01	----	<0.01	----	----
Metribuzin	21087-64-9	0.02	µg/L	<0.02	----	<0.02	----	----
Mevinphos	7786-34-7	0.02	µg/L	<0.02	----	<0.02	----	----

Analytical Results

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

Client sample ID				**Prospect Creek Upstream (Filtered)**	**Prospect Creek Upstream (Total)**	**Post Dredge Dam 2 - #3 (Filtered)**	**Post Dredge Dam 2 - #3 (Total)**	**----**
Client sampling date / time				17-Mar-2017 11:05	17-Mar-2017 11:05	17-Mar-2017 11:30	17-Mar-2017 11:30	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706362-001**	**ES1706362-002**	**ES1706362-003**	**ES1706362-004**	**--------**
				Result	Result	Result	Result	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Molinate	2212-67-1	0.1	µg/L	<0.1	----	<0.1	----	----
Monocrotophos	6923-22-4	0.02	µg/L	<0.02	----	<0.02	----	----
Myclobutanil	88671-89-0	0.1	µg/L	<0.1	----	<0.1	----	----
Naftalofos	1491-41-4	1	µg/L	<1.0	----	<1.0	----	----
Napropamide	15299-99-7	0.1	µg/L	<0.1	----	<0.1	----	----
Nitralin	4726-14-1	0.1	µg/L	<0.1	----	<0.1	----	----
Norflurazon	27314-13-2	0.1	µg/L	<0.1	----	<0.1	----	----
Novaluron	116714-46-6	0.1	µg/L	<0.1	----	<0.1	----	----
Omethoate	1113-02-6	0.01	µg/L	<0.01	----	<0.01	----	----
Oxamyl	23135-22-0	0.01	µg/L	<0.01	----	<0.01	----	----
Oxyfluorfen	42874-03-3	1	µg/L	<1.0	----	<1.0	----	----
Paclobutrazole	76738-62-0	0.05	µg/L	<0.05	----	<0.05	----	----
Parathion	56-38-2	0.2	µg/L	<0.2	----	<0.2	----	----
Parathion-methyl	298-00-0	0.5	µg/L	<0.5	----	<0.5	----	----
Pebulate	1114-71-2	0.1	µg/L	<0.1	----	<0.1	----	----
Penconazole	66246-88-6	0.01	µg/L	<0.01	----	<0.01	----	----
Pendimethalin	40487-42-1	0.05	µg/L	<0.05	----	<0.05	----	----
Phorate	298-02-2	0.1	µg/L	<0.1	----	<0.1	----	----
Pirimicarb	23103-98-2	0.1	µg/L	<0.1	----	<0.1	----	----
Pirimiphos-ethyl	23505-41-1	0.01	µg/L	<0.01	----	<0.01	----	----
Pirimiphos-methyl	29232-93-7	0.01	µg/L	<0.01	----	<0.01	----	----
Prochloraz	67747-09-5	0.1	µg/L	<0.1	----	<0.1	----	----
Profenofos	41198-08-7	0.01	µg/L	<0.01	----	<0.01	----	----
Promecarb	2631-37-0	0.1	µg/L	<0.1	----	<0.1	----	----
Prometryn	7287-19-6	0.01	µg/L	<0.01	----	<0.01	----	----
Propachlor	1918-16-7	0.1	µg/L	<0.1	----	<0.1	----	----
Propamocarb	24579-73-5	0.1	µg/L	<0.1	----	<0.1	----	----
Propargite	2312-35-8	0.1	µg/L	<0.1	----	<0.1	----	----
Propazine	139-40-2	0.01	µg/L	<0.01	----	<0.01	----	----
Propiconazole	60207-90-1	0.05	µg/L	<0.05	----	<0.05	----	----
Propyzamide	23950-58-5	0.1	µg/L	<0.1	----	<0.1	----	----
Prothiofos	34643-46-4	0.1	µg/L	<0.1	----	<0.1	----	----
Pyraclostrobin	175013-18-0	0.1	µg/L	<0.1	----	<0.1	----	----
Pyrazophos	13457-18-6	0.1	µg/L	<0.1	----	<0.1	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Prospect Creek Upstream (Filtered)**	**Prospect Creek Upstream (Total)**	**Post Dredge Dam 2 - #3 (Filtered)**	**Post Dredge Dam 2 - #3 (Total)**	**----**
			Client sampling date / time	17-Mar-2017 11:05	17-Mar-2017 11:05	17-Mar-2017 11:30	17-Mar-2017 11:30	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706362-001**	**ES1706362-002**	**ES1706362-003**	**ES1706362-004**	**--------**
				Result	Result	Result	Result	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Pyrimethanil	53112-28-0	0.02	µg/L	<0.02	----	<0.02	----	----
Pyriproxyfen	95737-68-1	0.1	µg/L	<0.1	----	<0.1	----	----
Pyroxsulam	422556-08-9	0.1	µg/L	<0.1	----	<0.1	----	----
Quinclorac	84087-01-4	0.1	µg/L	<0.1	----	<0.1	----	----
Rimsulfuron	122931-48-0	0.1	µg/L	<0.1	----	<0.1	----	----
Siduron	1982-49-6	0.1	µg/L	<0.1	----	<0.1	----	----
Simazine	122-34-9	0.02	µg/L	<0.02	----	<0.02	----	----
Spirotetramat	203313-25-1	0.1	µg/L	<0.1	----	<0.1	----	----
Sulfotep	3689-24-5	0.005	µg/L	<0.005	----	<0.005	----	----
Sulprofos	35400-43-2	0.05	µg/L	<0.05	----	<0.05	----	----
Tebuconazole	107534-96-3	0.01	µg/L	<0.01	----	<0.01	----	----
Tebuthiuron	34014-18-1	0.02	µg/L	<0.02	----	**0.06**	----	----
Temephos	3383-96-8	0.02	µg/L	<0.02	----	<0.02	----	----
Terbacil	5902-51-2	0.1	µg/L	<0.1	----	<0.1	----	----
Terbufos	13071-79-9	0.01	µg/L	<0.01	----	<0.01	----	----
Terbuthylazine	5915-41-3	0.01	µg/L	<0.01	----	<0.01	----	----
Terbutryn	886-50-0	0.01	µg/L	<0.01	----	<0.01	----	----
Tetrachlorvinphos	22248-79-9	0.01	µg/L	<0.01	----	<0.01	----	----
Tetraconazole	112281-77-3	0.1	µg/L	<0.1	----	<0.1	----	----
Thiamethoxam	153719-23-4	0.02	µg/L	<0.02	----	<0.02	----	----
Thiobencarb	28249-77-6	0.01	µg/L	<0.01	----	<0.01	----	----
Thiodicarb	59669-26-0	0.01	µg/L	<0.01	----	<0.01	----	----
Thiometon	640-15-3	0.5	µg/L	<0.5	----	<0.5	----	----
Toltrazuril	69004-03-1	0.5	µg/L	<0.5	----	<0.5	----	----
Triadimefon	43121-43-3	0.1	µg/L	<0.1	----	<0.1	----	----
Triadimenol	55219-65-3	0.1	µg/L	<0.1	----	<0.1	----	----
Triazophos	24017-47-8	0.005	µg/L	<0.005	----	<0.005	----	----
Trichlorfon	52-68-6	0.02	µg/L	<0.02	----	<0.02	----	----
Trichloronate	327-98-0	0.5	µg/L	<0.5	----	<0.5	----	----
Trifloxystrobin	141517-21-7	0.1	µg/L	<0.1	----	<0.1	----	----
Trifloxysulfuron-sodium	199119-58-9	0.1	µg/L	<0.1	----	<0.1	----	----
Trifluralin	1582-09-8	10	µg/L	<10.0	----	<10.0	----	----
Trinexapac Ethyl	95266-40-3	1	µg/L	<1	----	<1	----	----
Vernolate	1929-77-7	0.1	µg/L	<0.1	----	<0.1	----	----

Analytical Results

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

			Client sample ID	**Prospect Creek Upstream (Filtered)**	**Prospect Creek Upstream (Total)**	**Post Dredge Dam 2 - #3 (Filtered)**	**Post Dredge Dam 2 - #3 (Total)**	----
			Client sampling date / time	17-Mar-2017 11:05	17-Mar-2017 11:05	17-Mar-2017 11:30	17-Mar-2017 11:30	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706362-001**	**ES1706362-002**	**ES1706362-003**	**ES1706362-004**	--------
				Result	Result	Result	Result	----
EP247: Phenolics and Related Compounds								
2,4-Dinitrophenol	51-28-5	0.01	µg/L	<0.01	----	**0.07**	----	----
2-Methyl-4.6-dinitrophenol	8071-51-0	0.05	µg/L	<0.05	----	<0.05	----	----
4-Nonylphenol (mixture of isomers)	84852-15-3	0.1	µg/L	<0.10	----	**0.13**	----	----
Hexachlorophene	70-30-4	0.1	µg/L	<0.10	----	<0.10	----	----
4-Nitrophenol	100-02-7	0.1	µg/L	<0.10	----	**1.02**	----	----
4-Chloro-3-methylphenol	59-50-7	0.1	µg/L	<0.10	----	**0.87**	----	----
Pentachlorophenol	87-86-5	0.1	µg/L	<0.10	----	**0.19**	----	----
Dinoseb	88-85-7	0.1	µg/L	<0.10	----	<0.10	----	----
Dalapon	75-99-0	0.1	µg/L	<0.10	----	**0.14**	----	----
Bisphenol-A	80-05-7	0.05	µg/L	<0.05	----	**3.01**	----	----
MW002: Heterotrophic Plate Count								
Heterotrophic Plate Count (22°C)	----	1	CFU/mL	----	**~33000**	----	**460**	----
MW006: Faecal Coliforms & E.coli by MF								
Escherichia coli	----	1	CFU/100mL	----	**140**	----	<1	----
MW007: Coliforms by MF								
Coliforms	----	1	CFU/100mL	----	**~2400**	----	**~1**	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	**20.1**	----	**21.8**	----	----
2-Chlorophenol-D4	93951-73-6	1	%	**38.1**	----	**36.1**	----	----
2.4.6-Tribromophenol	118-79-6	1	%	**46.4**	----	**39.2**	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	**63.8**	----	**81.9**	----	----
Anthracene-d10	1719-06-8	1	%	**86.6**	----	**94.0**	----	----
4-Terphenyl-d14	1718-51-0	1	%	**92.2**	----	**92.5**	----	----
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	2	%	**36.4**	----	**1.75**	----	----
Phenol-d6	13127-88-3	2	%	**29.9**	----	**6.99**	----	----
2-Chlorophenol-D4	93951-73-6	2	%	**52.4**	----	**3.96**	----	----
2.4.6-Tribromophenol	118-79-6	2	%	**55.6**	----	**1.19**	----	----
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	2	%	**62.4**	----	**60.7**	----	----
1.2-Dichlorobenzene-D4	2199-69-1	2	%	**60.3**	----	**56.4**	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**Prospect Creek Upstream (Filtered)**	**Prospect Creek Upstream (Total)**	**Post Dredge Dam 2 - #3 (Filtered)**	**Post Dredge Dam 2 - #3 (Total)**	----
			Client sampling date / time	17-Mar-2017 11:05	17-Mar-2017 11:05	17-Mar-2017 11:30	17-Mar-2017 11:30	----
Compound	CAS Number	LOR	Unit	**ES1706362-001**	**ES1706362-002**	**ES1706362-003**	**ES1706362-004**	--------
				Result	Result	Result	Result	----
EP075T: Base/Neutral Extractable Surrogates - Continued								
2-Fluorobiphenyl	321-60-8	2	%	**65.3**	----	**65.2**	----	----
Anthracene-d10	1719-06-8	2	%	**80.4**	----	**72.8**	----	----
4-Terphenyl-d14	1718-51-0	2	%	**86.3**	----	**76.2**	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**116**	----	**102**	----	----
Toluene-D8	2037-26-5	2	%	**127**	----	**109**	----	----
4-Bromofluorobenzene	460-00-4	2	%	**127**	----	**103**	----	----
EP094S: Pesticide Surrogate								
DEF	78-48-8	0.5	%	**88.2**	----	**84.0**	----	----
EP125S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**108**	----	**111**	----	----
Toluene-D8	2037-26-5	0.1	%	**108**	----	**107**	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**108**	----	**111**	----	----
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.01	%	**81.8**	----	**83.1**	----	----
EP131T: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	**114**	----	**117**	----	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**73.0**	----	**63.3**	----	----
Anthracene-d10	1719-06-8	0.1	%	**77.7**	----	**69.5**	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**76.7**	----	**68.7**	----	----
EP203S: Explosives Surrogate								
o-Dinitrobenzene	528-29-0	1	%	**80.4**	----	**112**	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	10	117
Phenol-d6	13127-88-3	10	69
2-Chlorophenol-D4	93951-73-6	21	130
2.4.6-Tribromophenol	118-79-6	10	151
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	29	142
1.2-Dichlorobenzene-D4	2199-69-1	24	121
2-Fluorobiphenyl	321-60-8	27	135
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	21	123
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128
EP094S: Pesticide Surrogate			
DEF	78-48-8	42	143
EP125S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	65	127
4-Bromofluorobenzene	460-00-4	68	124
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	14	166
EP131T: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	10	144
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	135
Anthracene-d10	1719-06-8	48	138
4-Terphenyl-d14	1718-51-0	48	144
EP203S: Explosives Surrogate			

Sub-Matrix: **WATER**

Compound	*CAS Number*	***Recovery Limits (%)*** Low	High
EP203S: Explosives Surrogate - Continued			
o-Dinitrobenzene	528-29-0	51	125

CERTIFICATE OF ANALYSIS

Work Order	: **ES1706925**	Page	: 1 of 20
Client	: **BORAL RECYCLING - WIDEMERE**	Laboratory	: Environmental Division Sydney
Contact	: PHILIP PATERSON	Contact	: Customer Services ES
Address	: Boral Recycling Wetherill Park, NSW 2164	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: 02 9604 9101	Telephone	: +61-2-8784 8555
Project	: SURFACE WATER ANALYSIS	Date Samples Received	: 23-Mar-2017 12:45
Order number	: 5721202	Date Analysis Commenced	: 23-Mar-2017
C-O-C number	: ----	Issue Date	: 31-Mar-2017 17:12
Sampler	: CHRIS V.		
Site	: ----		
Quote number	: SY/662/16 V5		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Amanda Conkie	Organic Chemist	Brisbane Organics, Stafford, QLD
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW
Raymond Commodore	Instrument Chemist	Sydney Inorganics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW
Sarah Axisa	Microbiologist	Sydney Microbiology, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
~ = Indicates an estimated value.

- EP125: Poor matrix spike recovery due to sample matrix effects. This has been confirmed by re-analysis.
- EG093: Sample was run on EG094 method due to low TDS content.
- Total Organic Carbon (TOC) by EP005 conducted by ALS Melbourne, NATA accreditation no. 825, site no 13778
- CFU = colony forming unit
- MF = membrane filtration
- Microbiological Comment: HPC results are reported an approximate (~) when the count of colonies on the plate is outside the range of 10 - 300cfu, in accordance with ALS work instruction QWI-MIC/MW002.
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- EP075: Poor surrogate recovery due to sample heterogeneity. Confirmed by re-extraction and re-analysis.
- EP050: The MBAS reported is calculated as LAS, mol wt __342_____.
- Total PAH reported as the sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene and Benzo(g,h,i)perylene.
- EP075: 'Sum of PAH' is the sum of the USEPA 16 priority PAHs
- MW002 is ALS's internal code and is equivalent to AS4276.3.1.
- MW006 is ALS's internal code and is equivalent to AS4276.7.
- MW007 is ALS's internal code and is equivalent to AS4276.5.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 2 POST DREDGE #4 (FILTERED)**	**DAM 2 POST DREDGE #4 (TOTAL)**	----	----	----
			Client sampling date / time	23-Mar-2017 11:00	23-Mar-2017 11:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706925-001**	**ES1706925-002**	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	----	**10.3**	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	----	**540**	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	----	**20**	----	----	----
EA045: Turbidity								
Turbidity	----	0.1	NTU	----	**14.4**	----	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	**32**	----	----	----	----
EA075: Redox Potential								
Redox Potential	----	0.1	mV	**45.0**	----	----	----	----
pH Redox	----	0.01	pH Unit	**11.0**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**69**	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**38**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**13**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	<1	----	----	----	----
Sodium	7440-23-5	1	mg/L	**82**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**45**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Gallium	7440-55-3	0.001	mg/L	**0.005**	----	----	----	----
Lanthanum	7439-91-0	0.001	mg/L	<0.001	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.00004	mg/L	<0.00004	----	----	----	----
EG049G LL-F: Dissolved Trivalent Chromium - Low Level								
Trivalent Chromium	16065-83-1	0.001	mg/L	<0.001	----	----	----	----
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level								
Hexavalent Chromium	18540-29-9	0.001	mg/L	**0.026**	----	----	----	----
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.05	mg/L	**4.33**	----	----	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 2 POST DREDGE #4 (FILTERED)**	**DAM 2 POST DREDGE #4 (TOTAL)**	----	----	----
			Client sampling date / time	23-Mar-2017 11:00	23-Mar-2017 11:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706925-001**	**ES1706925-002**	--------	--------	--------
				Result	Result	----	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS - Continued								
Aluminium	7429-90-5	5	µg/L	**2700**	----	----	----	----
Antimony	7440-36-0	0.5	µg/L	**1.5**	----	----	----	----
Arsenic	7440-38-2	0.5	µg/L	**1.9**	----	----	----	----
Barium	7440-39-3	1	µg/L	**12**	----	----	----	----
Beryllium	7440-41-7	0.1	µg/L	<0.1	----	----	----	----
Bismuth	7440-69-9	0.1	µg/L	<0.1	----	----	----	----
Boron	7440-42-8	100	µg/L	<100	----	----	----	----
Cadmium	7440-43-9	0.2	µg/L	<0.2	----	----	----	----
Chromium	7440-47-3	0.5	µg/L	**25.7**	----	----	----	----
Cobalt	7440-48-4	0.2	µg/L	**1.8**	----	----	----	----
Copper	7440-50-8	1	µg/L	**18**	----	----	----	----
Iron	7439-89-6	5	µg/L	**64**	----	----	----	----
Lead	7439-92-1	0.2	µg/L	**1.7**	----	----	----	----
Manganese	7439-96-5	0.5	µg/L	**0.9**	----	----	----	----
Molybdenum	7439-98-7	0.1	µg/L	**20.6**	----	----	----	----
Nickel	7440-02-0	0.5	µg/L	**3.7**	----	----	----	----
Selenium	7782-49-2	2	µg/L	<2	----	----	----	----
Silver	7440-22-4	0.1	µg/L	<0.1	----	----	----	----
Strontium	7440-24-6	10	µg/L	**167**	----	----	----	----
Thallium	7440-28-0	0.1	µg/L	<0.1	----	----	----	----
Tin	7440-31-5	5	µg/L	<5	----	----	----	----
Uranium	7440-61-1	0.1	µg/L	<0.1	----	----	----	----
Vanadium	7440-62-2	0.5	µg/L	**39.8**	----	----	----	----
Zinc	7440-66-6	5	µg/L	**6**	----	----	----	----
EK010-1: Chlorine								
Total Residual Chlorine	----	0.02	mg/L	**0.02**	----	----	----	----
EK025SF: Free CN by Segmented Flow Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	**0.008**	----	----	----	----
EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser								
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 2 POST DREDGE #4 (FILTERED)**	**DAM 2 POST DREDGE #4 (TOTAL)**	----	----	----
			Client sampling date / time	23-Mar-2017 11:00	23-Mar-2017 11:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706925-001**	**ES1706925-002**	--------	--------	--------
				Result	Result	----	----	----
EK084: Un-ionized Hydrogen Sulfide								
Unionized Hydrogen Sulfide	----	0.1	mg/L	<0.1	----	----	----	----
EK255A: Ammonia								
Ammonia as N	7664-41-7	0.005	mg/L	**0.284**	----	----	----	----
EK257A: Nitrite								
Nitrite as N	14797-65-0	0.002	mg/L	**3.15**	----	----	----	----
EK258A: Nitrate								
Nitrate as N	14797-55-8	0.002	mg/L	**2.37**	----	----	----	----
EK259A: Nitrite and Nitrate (NOx)								
Nitrite + Nitrate as N	----	0.002	mg/L	**5.52**	----	----	----	----
EK261A: Total Kjeldahl Nitrogen								
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	**2.43**	----	----	----	----
EK262A: Total Nitrogen								
Total Nitrogen as N	----	0.01	mg/L	**7.95**	----	----	----	----
EK267A: Total Phosphorus (Persulfate Digestion)								
Total Phosphorus as P	----	0.005	mg/L	**0.016**	----	----	----	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	**13**	----	----	----	----
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	<1	----	----	----	----
EP020: Oil and Grease (O&G)								
Oil & Grease	----	5	mg/L	----	<5	----	----	----
EP026SP: Chemical Oxygen Demand (Spectrophotometric)								
Chemical Oxygen Demand	----	10	mg/L	**40**	----	----	----	----
EP030: Biochemical Oxygen Demand (BOD)								
Biochemical Oxygen Demand	----	2	mg/L	<2	----	----	----	----
EP050: Anionic Surfactants as MBAS								
Anionic Surfactants as MBAS	----	0.1	mg/L	<0.1	----	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1	µg/L	<1.0	----	----	----	----
2-Chlorophenol	95-57-8	1	µg/L	<1.0	----	----	----	----
2-Methylphenol	95-48-7	1	µg/L	<1.0	----	----	----	----
3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	----	----	----	----
2-Nitrophenol	88-75-5	1	µg/L	<1.0	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 2 POST DREDGE #4 (FILTERED)**	**DAM 2 POST DREDGE #4 (TOTAL)**	**----**	**----**	**----**
			Client sampling date / time	23-Mar-2017 11:00	23-Mar-2017 11:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706925-001**	**ES1706925-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP075(SIM)A: Phenolic Compounds - Continued								
2.4-Dimethylphenol	105-67-9	1	µg/L	<1.0	----	----	----	----
2.4-Dichlorophenol	120-83-2	1	µg/L	<1.0	----	----	----	----
2.6-Dichlorophenol	87-65-0	1	µg/L	<1.0	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	1	µg/L	<1.0	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	1	µg/L	<1.0	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	1	µg/L	<1.0	----	----	----	----
Pentachlorophenol	87-86-5	2	µg/L	<2.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	----	----	----	----
EP075C: Phthalate Esters								
Dimethyl phthalate	131-11-3	2	µg/L	<2	----	----	----	----
Diethyl phthalate	84-66-2	2	µg/L	<2	----	----	----	----
Di-n-butyl phthalate	84-74-2	2	µg/L	<2	----	----	----	----
Butyl benzyl phthalate	85-68-7	2	µg/L	<2	----	----	----	----
bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L	<10	----	----	----	----
Di-n-octylphthalate	117-84-0	2	µg/L	<2	----	----	----	----
EP075G: Chlorinated Hydrocarbons								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 2 POST DREDGE #4 (FILTERED)**	**DAM 2 POST DREDGE #4 (TOTAL)**	----	----	----
			Client sampling date / time	23-Mar-2017 11:00	23-Mar-2017 11:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706925-001**	**ES1706925-002**	--------	--------	--------
				Result	Result	----	----	----
EP075G: Chlorinated Hydrocarbons - Continued								
1.3-Dichlorobenzene	541-73-1	2	µg/L	<2	----	----	----	----
1.4-Dichlorobenzene	106-46-7	2	µg/L	<2	----	----	----	----
1.2-Dichlorobenzene	95-50-1	2	µg/L	<2	----	----	----	----
Hexachloroethane	67-72-1	2	µg/L	<2	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	2	µg/L	<2	----	----	----	----
Hexachloropropylene	1888-71-7	2	µg/L	<2	----	----	----	----
Hexachlorobutadiene	87-68-3	2	µg/L	<2	----	----	----	----
Hexachlorocyclopentadiene	77-47-4	10	µg/L	<10	----	----	----	----
Pentachlorobenzene	608-93-5	2	µg/L	<2	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	4	µg/L	<4	----	----	----	----
EP075H: Anilines and Benzidines								
Aniline	62-53-3	2	µg/L	<2	----	----	----	----
4-Chloroaniline	106-47-8	2	µg/L	<2	----	----	----	----
2-Nitroaniline	88-74-4	4	µg/L	<4	----	----	----	----
3-Nitroaniline	99-09-2	4	µg/L	<4	----	----	----	----
Dibenzofuran	132-64-9	2	µg/L	<2	----	----	----	----
4-Nitroaniline	100-01-6	2	µg/L	<2	----	----	----	----
Carbazole	86-74-8	2	µg/L	<2	----	----	----	----
3.3`-Dichlorobenzidine	91-94-1	2	µg/L	<2	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	----	----	----	----

Analytical Results

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

			Client sample ID	**DAM 2 POST DREDGE #4 (FILTERED)**	**DAM 2 POST DREDGE #4 (TOTAL)**	**----**	**----**	**----**
			Client sampling date / time	23-Mar-2017 11:00	23-Mar-2017 11:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706925-001**	**ES1706925-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued								
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ **Total Xylenes**	1330-20-7	2	µg/L	<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP094A: Synthetic Pyrethroids								
Bioresmethrin	28434-01-07	0.5	µg/L	<0.5	----	----	----	----
Bifenthrin	82657-04-3	0.5	µg/L	<0.5	----	----	----	----
Phenothrin	26002-80-2	0.5	µg/L	<0.5	----	----	----	----
Lambda-cyhalothrin	68085-85-8	0.5	µg/L	<0.5	----	----	----	----
Permethrin	52645-53-1	0.5	µg/L	<0.5	----	----	----	----
Cyfluthrin	68359-37-5	0.5	µg/L	<0.5	----	----	----	----
Cypermethrin	52315-07-8	0.5	µg/L	<0.5	----	----	----	----
Fenvalverate & Esfenvalerate	51630-58-1/66230-04-	0.5	µg/L	<0.5	----	----	----	----
Deltamethrin & Tralomethrin	62229-77-0/66841-25-	0.5	µg/L	<0.5	----	----	----	----
Allethrin	584-79-2	0.5	µg/L	<0.5	----	----	----	----
Transfluthrin	118712-89-3	0.5	µg/L	<0.5	----	----	----	----
Tau-fluvalinate	102851-06-9	0.5	µg/L	<0.5	----	----	----	----
Tetramethrin	68085-85-8	0.5	µg/L	<0.5	----	----	----	----
EP094B: Synergist								
Piperonyl Butoxide	63993-73-7	0.5	µg/L	<0.5	----	----	----	----
EP117: Alcohols								
Ethanol	64-17-5	50	µg/L	<50	----	----	----	----
Isopropanol	67-63-0	50	µg/L	<50	----	----	----	----
n-Propanol	71-23-8	50	µg/L	<50	----	----	----	----
Isobutanol	78-83-1	50	µg/L	<50	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 2 POST DREDGE #4 (FILTERED)**	**DAM 2 POST DREDGE #4 (TOTAL)**	----	----	----
			Client sampling date / time	23-Mar-2017 11:00	23-Mar-2017 11:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706925-001**	**ES1706925-002**	--------	--------	--------
				Result	Result	----	----	----
EP117: Alcohols - Continued								
n-Butanol	71-36-3	50	µg/L	<50	----	----	----	----
EP125A: Monocyclic Aromatic Hydrocarbons								
Benzene	71-43-2	0.05	µg/L	<0.05	----	----	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.05	µg/L	**0.05**	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.05	µg/L	**0.08**	----	----	----	----
Styrene	100-42-5	0.05	µg/L	<0.05	----	----	----	----
ortho-Xylene	95-47-6	0.05	µg/L	<0.05	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	0.05	µg/L	<0.05	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	0.05	µg/L	<0.05	----	----	----	----
EP125D: Fumigants								
1.2-Dichloropropane	78-87-5	0.1	µg/L	<0.1	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.1	µg/L	<0.1	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.1	µg/L	<0.1	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.1	µg/L	<0.1	----	----	----	----
EP125E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	0.5	µg/L	<0.5	----	----	----	----
Vinyl chloride	75-01-4	0.3	µg/L	<0.3	----	----	----	----
Bromomethane	74-83-9	0.5	µg/L	<0.5	----	----	----	----
Chloroethane	75-00-3	0.5	µg/L	<0.5	----	----	----	----
Trichlorofluoromethane	75-69-4	0.5	µg/L	<0.5	----	----	----	----
1.1-Dichloroethene	75-35-4	0.1	µg/L	<0.1	----	----	----	----
Dichloromethane	75-09-2	1	µg/L	<1.0	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	0.1	µg/L	<0.1	----	----	----	----
1.1-Dichloroethane	75-34-3	0.1	µg/L	<0.1	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	0.1	µg/L	<0.1	----	----	----	----
Bromochloromethane	74-97-5	0.5	µg/L	<0.5	----	----	----	----
1.2-Dichloroethane	107-06-2	0.1	µg/L	<0.1	----	----	----	----
1.1.1-Trichloroethane	71-55-6	0.1	µg/L	<0.1	----	----	----	----
Carbon Tetrachloride	56-23-5	0.05	µg/L	<0.05	----	----	----	----
Trichloroethene	79-01-6	0.05	µg/L	<0.05	----	----	----	----
Tetrachloroethene	127-18-4	0.05	µg/L	<0.05	----	----	----	----
Hexachlorobutadiene	87-68-3	0.04	µg/L	<0.04	----	----	----	----
EP125F: Halogenated Aromatic Compounds								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 2 POST DREDGE #4 (FILTERED)**	**DAM 2 POST DREDGE #4 (TOTAL)**	----	----	----
			Client sampling date / time	23-Mar-2017 11:00	23-Mar-2017 11:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706925-001**	**ES1706925-002**	--------	--------	--------
				Result	Result	----	----	----
EP125F: Halogenated Aromatic Compounds - Continued								
Chlorobenzene	108-90-7	0.1	µg/L	**0.54**	----	----	----	----
Bromobenzene	108-86-1	0.1	µg/L	<0.10	----	----	----	----
Benzylchloride	100-44-7	0.2	µg/L	<0.2	----	----	----	----
1.3-Dichlorobenzene	541-73-1	0.1	µg/L	<0.10	----	----	----	----
1.4-Dichlorobenzene	106-46-7	0.1	µg/L	<0.10	----	----	----	----
1.2-Dichlorobenzene	95-50-1	0.1	µg/L	<0.10	----	----	----	----
2-Chlorotoluene	95-49-8	0.1	µg/L	<0.1	----	----	----	----
4-Chlorotoluene	106-43-4	0.1	µg/L	<0.1	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.1	µg/L	<0.1	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.1	µg/L	<0.1	----	----	----	----
^ **Trichlorobenzenes (Sum)**	----	0.1	µg/L	<0.1	----	----	----	----
EP125G: Trihalomethanes								
Chloroform	67-66-3	0.1	µg/L	**0.11**	----	----	----	----
Bromodichloromethane	75-27-4	0.1	µg/L	<0.10	----	----	----	----
Dibromochloromethane	124-48-1	0.1	µg/L	<0.10	----	----	----	----
Bromoform	75-25-2	0.1	µg/L	<0.10	----	----	----	----
^ **Total Trihalomethanes**	----	0.1	µg/L	**0.11**	----	----	----	----
EP125H: Naphthalene								
Naphthalene	91-20-3	0.05	µg/L	<0.05	----	----	----	----
EP125L: Methyl t-butyl ether								
Methyl tert-butyl ether (MTBE)	1634-04-4	0.1	µg/L	<0.1	----	----	----	----
EP131A: Organochlorine Pesticides								
Aldrin	309-00-2	0.01	µg/L	<0.010	----	----	----	----
alpha-BHC	319-84-6	0.01	µg/L	<0.010	----	----	----	----
beta-BHC	319-85-7	0.01	µg/L	<0.010	----	----	----	----
delta-BHC	319-86-8	0.01	µg/L	<0.010	----	----	----	----
4.4`-DDD	72-54-8	0.01	µg/L	<0.010	----	----	----	----
4.4`-DDE	72-55-9	0.01	µg/L	<0.010	----	----	----	----
4.4`-DDT	50-29-3	0.01	µg/L	<0.010	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.01	µg/L	<0.010	----	----	----	----
Dieldrin	60-57-1	0.01	µg/L	<0.010	----	----	----	----
alpha-Endosulfan	959-98-8	0.01	µg/L	<0.010	----	----	----	----
beta-Endosulfan	33213-65-9	0.01	µg/L	<0.010	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 2 POST DREDGE #4 (FILTERED)**	**DAM 2 POST DREDGE #4 (TOTAL)**	----	----	----
			Client sampling date / time	23-Mar-2017 11:00	23-Mar-2017 11:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706925-001**	**ES1706925-002**	--------	--------	--------
				Result	Result	----	----	----
EP131A: Organochlorine Pesticides - Continued								
Endosulfan sulfate	1031-07-8	0.01	µg/L	<0.010	----	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.01	µg/L	<0.010	----	----	----	----
Endrin	72-20-8	0.01	µg/L	<0.010	----	----	----	----
Endrin aldehyde	7421-93-4	0.01	µg/L	<0.010	----	----	----	----
Endrin ketone	53494-70-5	0.01	µg/L	<0.010	----	----	----	----
Heptachlor	76-44-8	0.005	µg/L	<0.005	----	----	----	----
Heptachlor epoxide	1024-57-3	0.01	µg/L	<0.010	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.01	µg/L	<0.010	----	----	----	----
gamma-BHC	58-89-9	0.01	µg/L	<0.010	----	----	----	----
Methoxychlor	72-43-5	0.01	µg/L	<0.010	----	----	----	----
cis-Chlordane	5103-71-9	0.01	µg/L	<0.010	----	----	----	----
trans-Chlordane	5103-74-2	0.01	µg/L	<0.010	----	----	----	----
^ **Total Chlordane (sum)**	----	0.01	µg/L	<0.010	----	----	----	----
Oxychlordane	27304-13-8	0.01	µg/L	<0.010	----	----	----	----
EP131B: Polychlorinated Biphenyls (as Aroclors)								
Total Polychlorinated biphenyls	----	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1016	12674-11-2	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1221	11104-28-2	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1232	11141-16-5	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1242	53469-21-9	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1248	12672-29-6	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1254	11097-69-1	0.1	µg/L	<0.10	----	----	----	----
Aroclor 1260	11096-82-5	0.1	µg/L	<0.10	----	----	----	----
EP132C: Chlorinated Naphthalenes								
1-Chloronaphthalene	90-13-1	0.1	µg/L	<0.1	----	----	----	----
2-Chloronaphthalene	91-58-7	0.1	µg/L	<0.1	----	----	----	----
^ **Chloronaphthalenes (1- + 2-)**	----	0.1	µg/L	<0.1	----	----	----	----
EP203A: Explosives								
HMX	2691-41-0	1	µg/L	<1.0	----	----	----	----
RDX	----	1	µg/L	<1.0	----	----	----	----
1.3.5-Trinitrobenzene	99-35-4	1	µg/L	<1.0	----	----	----	----
1.3-Dinitrobenzene	99-65-0	1	µg/L	<1.0	----	----	----	----
Tetryl	479-45-8	1	µg/L	<1.0	----	----	----	----
2.4.6-TNT	118-96-7	1	µg/L	<1.0	----	----	----	----

Analytical Results

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

			Client sample ID	**DAM 2 POST DREDGE #4 (FILTERED)**	**DAM 2 POST DREDGE #4 (TOTAL)**	**----**	**----**	**----**
			Client sampling date / time	23-Mar-2017 11:00	23-Mar-2017 11:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706925-001**	**ES1706925-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP203A: Explosives - Continued								
4-Amino.2.6-DNT	19406-51-0	1	µg/L	<1.0	----	----	----	----
2-Amino-4.6-DNT	35572-78-2	1	µg/L	<1.0	----	----	----	----
4-& 2-AM-DNT(Isomeric Mixture)	----	1	µg/L	<1.0	----	----	----	----
2.4-Dinitrotoluene	121-14-2	1	µg/L	<1.0	----	----	----	----
2.6-Dinitrotoluene	606-20-2	1	µg/L	<1.0	----	----	----	----
2.4-& 2.6-DNT(Isomeric Mixture)	51-28-5/606-20-2	1	µg/L	<1.0	----	----	----	----
Nitrobenzene	98-95-3	1	µg/L	<1.0	----	----	----	----
2-Nitrotoluene	88-72-2	1	µg/L	<1.0	----	----	----	----
3-Nitrotoluene	99-08-1	1	µg/L	<1.0	----	----	----	----
4-Nitrotoluene	99-99-0	1	µg/L	<1.0	----	----	----	----
Nitroglycerine	55-63-0	5	µg/L	<5	----	----	----	----
PETN	78-11-5	5	µg/L	<5	----	----	----	----
EP234: Multiresidue Pesticides (ESI Positive)								
3-Hydroxy Carbofuran	16655-82-6	0.02	µg/L	<0.02	----	----	----	----
Abamectin	71751-41-2	0.1	µg/L	<0.1	----	----	----	----
Acephate	30560-19-1	0.5	µg/L	<0.5	----	----	----	----
Alachlor	15972-60-8	0.1	µg/L	<0.1	----	----	----	----
Aldicarb	116-06-3	0.05	µg/L	<0.05	----	----	----	----
Ametryn	834-12-8	0.01	µg/L	<0.01	----	----	----	----
Aminopyralid	150114-71-9	0.1	µg/L	<0.1	----	----	----	----
Amitraz	33089-61-1	100	µg/L	<100	----	----	----	----
Atrazine	1912-24-9	0.01	µg/L	<0.01	----	----	----	----
Atrazine-desethyl	6190-65-4	0.1	µg/L	<0.1	----	----	----	----
Atrazine-desisopropyl	1007-28-9	0.1	µg/L	<0.1	----	----	----	----
Azinphos-ethyl	2642-71-9	0.02	µg/L	<0.02	----	----	----	----
Azinphos-methyl	86-50-0	0.02	µg/L	<0.02	----	----	----	----
Azoxystrobin	131860-33-8	0.1	µg/L	<0.1	----	----	----	----
Bendiocarb	22781-23-3	0.1	µg/L	<0.10	----	----	----	----
Benomyl	17804-35-2	0.01	µg/L	**0.37**	----	----	----	----
Bensulfuron methyl	83055-99-6	0.1	µg/L	<0.1	----	----	----	----
Bensulide	741-58-2	0.1	µg/L	<0.1	----	----	----	----
Boscalid	188425-85-6	0.1	µg/L	<0.1	----	----	----	----
Bromacil	314-40-9	0.02	µg/L	<0.02	----	----	----	----
Bromophos-ethyl	4824-78-6	0.1	µg/L	<0.10	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 2 POST DREDGE #4 (FILTERED)**	**DAM 2 POST DREDGE #4 (TOTAL)**	----	----	----
			Client sampling date / time	23-Mar-2017 11:00	23-Mar-2017 11:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706925-001**	**ES1706925-002**	--------	--------	--------
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Butachlor	23184-66-9	0.1	µg/L	<0.1	----	----	----	----
Carbaryl	63-25-2	0.01	µg/L	<0.01	----	----	----	----
Carbendazim (Thiophanate methyl)	10605-21-7	0.1	µg/L	**0.4**	----	----	----	----
Carbofenothion	786-19-6	0.02	µg/L	<0.02	----	----	----	----
Carbofuran	1563-66-2	0.01	µg/L	<0.01	----	----	----	----
Carboxin	5234-68-4	0.1	µg/L	<0.1	----	----	----	----
Carfentrazone-ethyl	128639-02-1	0.1	µg/L	<0.1	----	----	----	----
Chlorantraniliprole	500008-45-7	0.1	µg/L	<0.1	----	----	----	----
Chlorfenvinphos	470-90-6	0.02	µg/L	<0.02	----	----	----	----
Chloroxuron	1982-47-4	0.1	µg/L	<0.1	----	----	----	----
Chlorpyrifos	2921-88-2	0.02	µg/L	<0.02	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.1	µg/L	<0.2	----	----	----	----
Chlorsulfuron	64902-72-3	0.2	µg/L	<0.2	----	----	----	----
Coumaphos	56-72-4	0.01	µg/L	<0.01	----	----	----	----
Cyanazine	21725-46-2	0.02	µg/L	<0.02	----	----	----	----
Cyproconazole	94361-06-5	0.02	µg/L	<0.02	----	----	----	----
Cyprodinil	121552-61-2	0.01	µg/L	<0.01	----	----	----	----
Cyromazine	66215-27-8	0.05	µg/L	<0.05	----	----	----	----
Demeton-O	298-03-0	0.02	µg/L	<0.02	----	----	----	----
Demeton-O & Demeton-S	298-03-3/126-75-0	0.02	µg/L	<0.02	----	----	----	----
Demeton-S	126-75-0	0.02	µg/L	<0.02	----	----	----	----
Demeton-S-methyl	919-86-8	0.02	µg/L	<0.02	----	----	----	----
Diazinon	333-41-5	0.01	µg/L	<0.01	----	----	----	----
Dichlobenil	1194-65-6	0.1	µg/L	<0.1	----	----	----	----
Dichlorvos	62-73-7	0.2	µg/L	<0.20	----	----	----	----
Diclofop-methyl	51338-27-3	0.05	µg/L	<0.05	----	----	----	----
Difenoconazole	119446-68-3	0.02	µg/L	<0.02	----	----	----	----
Diflubenzuron	35367-38-5	0.1	µg/L	<0.1	----	----	----	----
Dimethoate	60-51-5	0.02	µg/L	<0.02	----	----	----	----
Diphenamid	957-51-7	0.1	µg/L	<0.1	----	----	----	----
Disulfoton	298-04-4	0.05	µg/L	<0.05	----	----	----	----
Diuron	330-54-1	0.02	µg/L	<0.02	----	----	----	----
EPN	2104-64-5	0.05	µg/L	<0.05	----	----	----	----
EPTC	759-94-4	0.1	µg/L	<0.1	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 2 POST DREDGE #4 (FILTERED)**	**DAM 2 POST DREDGE #4 (TOTAL)**	----	----	----
			Client sampling date / time	23-Mar-2017 11:00	23-Mar-2017 11:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706925-001**	**ES1706925-002**	--------	--------	--------
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Ethion	563-12-2	0.02	µg/L	<0.02	----	----	----	----
Ethoprophos	13194-48-4	0.01	µg/L	<0.01	----	----	----	----
Etridiazole	2593-15-9	0.5	µg/L	<0.5	----	----	----	----
Fenamiphos	22224-92-6	0.01	µg/L	<0.01	----	----	----	----
Fenarimol	60168-88-9	0.02	µg/L	<0.02	----	----	----	----
Fenchlorphos (Ronnel)	299-84-3	10	µg/L	<10	----	----	----	----
Fenitrothion	122-14-5	2	µg/L	<2	----	----	----	----
Fenoxycarb	79127-80-3	0.1	µg/L	<0.1	----	----	----	----
Fensulfothion	115-90-2	0.01	µg/L	<0.01	----	----	----	----
Fenthion	55-38-9	0.05	µg/L	<0.05	----	----	----	----
Flamprop methyl	52756-25-9	0.1	µg/L	<0.1	----	----	----	----
Fluometuron	2164-17-2	0.01	µg/L	<0.01	----	----	----	----
Flusilazole	85509-19-9	0.02	µg/L	<0.02	----	----	----	----
Formothion	2540-82-1	20	µg/L	<20	----	----	----	----
Fosetyl Aluminium	39148-24-8	10	µg/L	<10	----	----	----	----
Haloxyfop	69806-34-4	0.1	µg/L	<0.1	----	----	----	----
Hexaconazole	79983-71-4	0.02	µg/L	<0.02	----	----	----	----
Hexazinone	51235-04-2	0.02	µg/L	<0.02	----	----	----	----
Imazapyr	94795-74-1	10	µg/L	<10.0	----	----	----	----
Indoxacarb	173584-44-6	0.1	µg/L	<0.1	----	----	----	----
Iodosulfuron methyl	144550-36-7	0.1	µg/L	<0.1	----	----	----	----
Irgarol	28159-98-0	0.002	µg/L	**0.005**	----	----	----	----
Isoproturon	34123-59-6	0.1	µg/L	<0.1	----	----	----	----
Malathion	121-75-5	0.02	µg/L	<0.02	----	----	----	----
Metalaxyl	57837-19-1	0.1	µg/L	<0.1	----	----	----	----
Metalaxyl-M	70630-17-0	0.1	µg/L	<0.1	----	----	----	----
Metaldehyde	108-62-3	10	µg/L	<10	----	----	----	----
Methidathion	950-37-8	0.1	µg/L	<0.1	----	----	----	----
Methiocarb	2032-65-7	0.01	µg/L	<0.01	----	----	----	----
Methomyl	16752-77-5	0.01	µg/L	<0.01	----	----	----	----
Metolachlor	51218-45-2	0.01	µg/L	<0.01	----	----	----	----
Metribuzin	21087-64-9	0.02	µg/L	<0.02	----	----	----	----
Mevinphos	7786-34-7	0.02	µg/L	<0.02	----	----	----	----
Molinate	2212-67-1	0.1	µg/L	<0.1	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 2 POST DREDGE #4 (FILTERED)**	**DAM 2 POST DREDGE #4 (TOTAL)**	----	----	----
			Client sampling date / time	23-Mar-2017 11:00	23-Mar-2017 11:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706925-001**	**ES1706925-002**	--------	--------	--------
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Monocrotophos	6923-22-4	0.02	µg/L	<0.02	----	----	----	----
Myclobutanil	88671-89-0	0.1	µg/L	<0.1	----	----	----	----
Naftalofos	1491-41-4	1	µg/L	<1.0	----	----	----	----
Napropamide	15299-99-7	0.1	µg/L	<0.1	----	----	----	----
Nitralin	4726-14-1	0.1	µg/L	<0.1	----	----	----	----
Norflurazon	27314-13-2	0.1	µg/L	<0.1	----	----	----	----
Novaluron	116714-46-6	0.1	µg/L	<0.1	----	----	----	----
Omethoate	1113-02-6	0.01	µg/L	<0.01	----	----	----	----
Oxamyl	23135-22-0	0.01	µg/L	<0.01	----	----	----	----
Oxyfluorfen	42874-03-3	1	µg/L	<1.0	----	----	----	----
Paclobutrazole	76738-62-0	0.05	µg/L	<0.05	----	----	----	----
Parathion	56-38-2	0.2	µg/L	<0.2	----	----	----	----
Parathion-methyl	298-00-0	0.5	µg/L	<0.5	----	----	----	----
Pebulate	1114-71-2	0.1	µg/L	<0.1	----	----	----	----
Penconazole	66246-88-6	0.01	µg/L	<0.01	----	----	----	----
Pendimethalin	40487-42-1	0.05	µg/L	<0.05	----	----	----	----
Phorate	298-02-2	0.1	µg/L	<0.1	----	----	----	----
Pirimicarb	23103-98-2	0.1	µg/L	<0.1	----	----	----	----
Pirimiphos-ethyl	23505-41-1	0.01	µg/L	<0.01	----	----	----	----
Pirimiphos-methyl	29232-93-7	0.01	µg/L	<0.01	----	----	----	----
Prochloraz	67747-09-5	0.1	µg/L	<0.1	----	----	----	----
Profenofos	41198-08-7	0.01	µg/L	<0.01	----	----	----	----
Promecarb	2631-37-0	0.1	µg/L	<0.1	----	----	----	----
Prometryn	7287-19-6	0.01	µg/L	<0.01	----	----	----	----
Propachlor	1918-16-7	0.1	µg/L	<0.1	----	----	----	----
Propamocarb	24579-73-5	0.1	µg/L	<0.1	----	----	----	----
Propargite	2312-35-8	0.1	µg/L	<0.1	----	----	----	----
Propazine	139-40-2	0.01	µg/L	<0.01	----	----	----	----
Propiconazole	60207-90-1	0.05	µg/L	<0.05	----	----	----	----
Propyzamide	23950-58-5	0.1	µg/L	<0.1	----	----	----	----
Prothiofos	34643-46-4	0.1	µg/L	<0.1	----	----	----	----
Pyraclostrobin	175013-18-0	0.1	µg/L	<0.1	----	----	----	----
Pyrazophos	13457-18-6	0.1	µg/L	<0.1	----	----	----	----
Pyrimethanil	53112-28-0	0.02	µg/L	<0.02	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 2 POST DREDGE #4 (FILTERED)**	**DAM 2 POST DREDGE #4 (TOTAL)**	----	----	----
			Client sampling date / time	23-Mar-2017 11:00	23-Mar-2017 11:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706925-001**	**ES1706925-002**	--------	--------	--------
				Result	Result	----	----	----
EP234: Multiresidue Pesticides (ESI Positive) - Continued								
Pyriproxyfen	95737-68-1	0.1	µg/L	<0.1	----	----	----	----
Pyroxsulam	422556-08-9	0.1	µg/L	<0.1	----	----	----	----
Quinclorac	84087-01-4	0.1	µg/L	<0.1	----	----	----	----
Rimsulfuron	122931-48-0	0.1	µg/L	<0.1	----	----	----	----
Siduron	1982-49-6	0.1	µg/L	<0.1	----	----	----	----
Simazine	122-34-9	0.02	µg/L	<0.02	----	----	----	----
Spirotetramat	203313-25-1	0.1	µg/L	<0.1	----	----	----	----
Sulfotep	3689-24-5	0.005	µg/L	<0.005	----	----	----	----
Sulprofos	35400-43-2	0.05	µg/L	<0.05	----	----	----	----
Tebuconazole	107534-96-3	0.01	µg/L	<0.01	----	----	----	----
Tebuthiuron	34014-18-1	0.02	µg/L	**0.10**	----	----	----	----
Temephos	3383-96-8	0.02	µg/L	<0.02	----	----	----	----
Terbacil	5902-51-2	0.1	µg/L	<0.1	----	----	----	----
Terbufos	13071-79-9	0.01	µg/L	<0.01	----	----	----	----
Terbuthylazine	5915-41-3	0.01	µg/L	<0.01	----	----	----	----
Terbutryn	886-50-0	0.01	µg/L	<0.01	----	----	----	----
Tetrachlorvinphos	22248-79-9	0.01	µg/L	<0.01	----	----	----	----
Tetraconazole	112281-77-3	0.1	µg/L	<0.1	----	----	----	----
Thiamethoxam	153719-23-4	0.02	µg/L	<0.02	----	----	----	----
Thiobencarb	28249-77-6	0.01	µg/L	<0.01	----	----	----	----
Thiodicarb	59669-26-0	0.01	µg/L	<0.01	----	----	----	----
Thiometon	640-15-3	0.5	µg/L	<0.5	----	----	----	----
Toltrazuril	69004-03-1	0.5	µg/L	<0.5	----	----	----	----
Triadimefon	43121-43-3	0.1	µg/L	<0.1	----	----	----	----
Triadimenol	55219-65-3	0.1	µg/L	<0.1	----	----	----	----
Triazophos	24017-47-8	0.005	µg/L	<0.005	----	----	----	----
Trichlorfon	52-68-6	0.02	µg/L	<0.02	----	----	----	----
Trichloronate	327-98-0	0.5	µg/L	<0.5	----	----	----	----
Trifloxystrobin	141517-21-7	0.1	µg/L	<0.1	----	----	----	----
Trifloxysulfuron-sodium	199119-58-9	0.1	µg/L	<0.1	----	----	----	----
Trifluralin	1582-09-8	10	µg/L	<10.0	----	----	----	----
Trinexapac Ethyl	95266-40-3	1	µg/L	<1	----	----	----	----
Vernolate	1929-77-7	0.1	µg/L	<0.1	----	----	----	----
EP247: Phenolics and Related Compounds								

Analytical Results

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

			Client sample ID	**DAM 2 POST DREDGE #4 (FILTERED)**	**DAM 2 POST DREDGE #4 (TOTAL)**	----	----	----
			Client sampling date / time	23-Mar-2017 11:00	23-Mar-2017 11:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706925-001**	**ES1706925-002**	--------	--------	--------
				Result	Result	----	----	----
EP247: Phenolics and Related Compounds - Continued								
2,4-Dinitrophenol	51-28-5	0.01	µg/L	**0.06**	----	----	----	----
2-Methyl-4.6-dinitrophenol	8071-51-0	0.05	µg/L	<0.05	----	----	----	----
4-Nonylphenol (mixture of isomers)	84852-15-3	0.1	µg/L	**0.39**	----	----	----	----
Hexachlorophene	70-30-4	0.1	µg/L	<0.10	----	----	----	----
4-Nitrophenol	100-02-7	0.1	µg/L	**1.20**	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.1	µg/L	**1.10**	----	----	----	----
Pentachlorophenol	87-86-5	0.1	µg/L	<0.10	----	----	----	----
Dinoseb	88-85-7	0.1	µg/L	<0.10	----	----	----	----
Dalapon	75-99-0	0.1	µg/L	**0.12**	----	----	----	----
Bisphenol-A	80-05-7	0.05	µg/L	**0.80**	----	----	----	----
MW002: Heterotrophic Plate Count								
Heterotrophic Plate Count (22°C)	----	1	CFU/mL	----	**1600**	----	----	----
MW006: Faecal Coliforms & E.coli by MF								
Escherichia coli	----	1	CFU/100mL	----	<1	----	----	----
MW007: Coliforms by MF								
Coliforms	----	1	CFU/100mL	----	<1	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	**16.4**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%	**38.3**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%	**41.7**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	**76.4**	----	----	----	----
Anthracene-d10	1719-06-8	1	%	**97.3**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1	%	**88.8**	----	----	----	----
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	2	%	**Not Determined**	----	----	----	----
Phenol-d6	13127-88-3	2	%	**Not Determined**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	2	%	**Not Determined**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	2	%	**Not Determined**	----	----	----	----
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	2	%	**57.3**	----	----	----	----
1.2-Dichlorobenzene-D4	2199-69-1	2	%	**54.9**	----	----	----	----
2-Fluorobiphenyl	321-60-8	2	%	**62.9**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**DAM 2 POST DREDGE #4 (FILTERED)**	**DAM 2 POST DREDGE #4 (TOTAL)**	**----**	**----**	**----**
			Client sampling date / time	23-Mar-2017 11:00	23-Mar-2017 11:00	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1706925-001**	**ES1706925-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP075T: Base/Neutral Extractable Surrogates - Continued								
Anthracene-d10	1719-06-8	2	%	**82.0**	**----**	**----**	**----**	**----**
4-Terphenyl-d14	1718-51-0	2	%	**94.6**	**----**	**----**	**----**	**----**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**87.1**	**----**	**----**	**----**	**----**
Toluene-D8	2037-26-5	2	%	**109**	**----**	**----**	**----**	**----**
4-Bromofluorobenzene	460-00-4	2	%	**104**	**----**	**----**	**----**	**----**
EP094S: Pesticide Surrogate								
DEF	78-48-8	0.5	%	**115**	**----**	**----**	**----**	**----**
EP125S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**115**	**----**	**----**	**----**	**----**
Toluene-D8	2037-26-5	0.1	%	**114**	**----**	**----**	**----**	**----**
4-Bromofluorobenzene	460-00-4	0.1	%	**119**	**----**	**----**	**----**	**----**
EP131S: OC Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.01	%	**83.8**	**----**	**----**	**----**	**----**
EP131T: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	**118**	**----**	**----**	**----**	**----**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**70.0**	**----**	**----**	**----**	**----**
Anthracene-d10	1719-06-8	0.1	%	**79.2**	**----**	**----**	**----**	**----**
4-Terphenyl-d14	1718-51-0	0.1	%	**79.3**	**----**	**----**	**----**	**----**
EP203S: Explosives Surrogate								
o-Dinitrobenzene	528-29-0	1	%	**83.8**	**----**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**

		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	10	117
Phenol-d6	13127-88-3	10	69
2-Chlorophenol-D4	93951-73-6	21	130
2.4.6-Tribromophenol	118-79-6	10	151
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	29	142
1.2-Dichlorobenzene-D4	2199-69-1	24	121
2-Fluorobiphenyl	321-60-8	27	135
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	21	123
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128
EP094S: Pesticide Surrogate			
DEF	78-48-8	42	143
EP125S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	65	127
4-Bromofluorobenzene	460-00-4	68	124
EP131S: OC Pesticide Surrogate			
Dibromo-DDE	21655-73-2	14	166
EP131T: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	10	144
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	135
Anthracene-d10	1719-06-8	48	138
4-Terphenyl-d14	1718-51-0	48	144
EP203S: Explosives Surrogate			

Sub-Matrix: **WATER**

Compound	*CAS Number*	*Recovery Limits (%)*	
		Low	***High***
EP203S: Explosives Surrogate - Continued			
o-Dinitrobenzene	528-29-0	51	125

Appendix F – Relevant Correspondence from Boral and the EPA

CELEBRATING70YEARS

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12th December 2016

Melissa Ward
Senior Manager Waste Compliance
Waste and Resource Recovery
Environment Protection Authority
PO Box A290
SYDNEY SOUTH NSW 1231

Dear Melissa,

PRP Surface Water Characterisation Assessment – Potential Pollutants of Concern Consultation - EPL 11815
Boral Recycling Pty Ltd – 38 Widemere Road, Wetherill Park

As per the Surface Water Characterisation Assessment PRP U1.4 a), Boral Recycling Pty Ltd (Boral) are to identify all potential pollutants of concern which may be present in a discharge from the premises in consultation with the EPA. Boral has been working closely with Victory Engineering on an appropriate approach. This following letter outlines our proposed approach for consideration by the EPA.

The proposed list is based on Table 3.4.1 of the ANZECC 2000 Guidelines, and includes:

- All Metals and Metalloids cited;
- As many of the other categories as practically possible; and,
- Some other useful characterisation analytes suggested by Victory Engineering.

Initially, it is expected that the list will be excessive, and that most of the species tested for will yield a non-positive result. The list also proposes a minimum number of rounds of testing for each analyte, after which the given analytes will be reviewed as to whether further testing is required or beneficial. The list will be reduced after consultation from the EPA.

Boral proposes to sample the following locations for each round of sampling:

- Dam 2 (the primary PRP subject);
- Prospect Creek, Upstream; and,
- Prospect Creek, Downstream.

Boral assert that Dam 2 is the water source that is critical to characterisation for the purposes of the PRP, being the last reservoir before discharge from site, and is actually the only data that is essential for presentation to the NSW EPA.

However, analysis of Prospect Creek may be useful for the purposes of better understanding the context of the site's surface water, and also potentially useful in determining any future discharge licence limits and/or trigger points.

Proposed Surface Water Characterisation Analytes

The proposed analytes for Dam 2 and Prospect Creek (Upstream and Downstream) are outlined in Table 1 below.

The primary purpose of the “Required Degree of Concentration” column in the table is to compare against potential laboratory concentration limits, to ensure they are appropriate for characterisation of the site’s surface waters to the concentrations required. The Required Degree of Concentration proposed for a given analyte was selected on the basis of consideration of:

- The ANZECC 2000 Water Quality Guidelines;
- Other sources of water quality guidelines (such as other international guidelines); and,
- Victory Engineering’s experience with water chemistry and analysis pertaining to the characterisation of process, waste, and environmental waters.

Note that the proposed Required Degree of Concentration for each analyte reflects Boral’s proposal for characterisation of the above surface waters for the current PRP response, and do not necessarily reflect what Boral proposes for future discharge licence limits or trigger points.

For the majority of analytes, “Dissolved” (or aqueous phase) analyses are proposed. This is because the removal of non-dissolved solids will be almost 100% with the implementation of an appropriate water treatment plant (the solid/turbid phase is likely to be a major source of any discharged contamination).

Hence, dissolved analyses will accurately reflect the efficient and effective operation of the solid-liquid separation stage of such a water treatment plant. This also means that the characterisation data can be reliably and cost-effectively used as the basis of design for any future water treatment plant, assuming an effective solid-liquid front-end.

Further, the proposed minimum of rounds of testing for a given analyte reflect Boral’s assessment of the following:

- The current perceived probability of the specie occurring in the site surface water in non-trivial concentration, primarily on the basis of low or non-use of agents that might be the source of the specie; and,
- The cost of continuing to test for the analyte.

A comment is provided for each listed analyte, to provide insight into Boral’s rationale for proposing that the analyte be included or excluded from the PRP Surface Water Discharge Characterisation Assessment.

Boral propose using ALS Environmental’s Sydney laboratory to stage the analysis of collected samples.

In the below table, “LOR” stands for the laboratory’s “Limit of Response”.

Boral expects to commence sampling shortly and would appreciate any feedback on our proposed approach.

If you require any further information regarding our comments please feel free to contact me on 0408 400 661.

Regards

Jason Sweeney
State Manger Recycling – NSW/ACT
Boral Recycling
E: jason.sweeney@boral.com.au

TABLE 1 - Table of Proposed Analytes for Dam 2 and Prospect Creek (Upstream and Downstream)

Proposed Analyte for Characterisation	Dissolved (D), Total (T)	Required Degree of Concentration (ug/L, unless otherwise specified)	Dam 2: Proposed Minimum Number of Rounds of Testing	Prospect Creek (Upstream and Downstream): Proposed Minimum Number of Rounds of Testing	ALS' LORs (ug/L, unless otherwise specified)	Proposal to EPA / Comment
Metals, Metalloids, Other Inorganic Species, and Other Tests						
Aluminium	D	55	5	5	5	Include; default ALS LOR is appropriate
Arsenic	D	13	5	5	0.5	Include; default ALS LOR is appropriate
Barium	D	1*	2	2	1	Include; default ALS LOR is appropriate
Beryllium	D	0.13	2	2	0.1	Include; default ALS LOR is appropriate
Boron	D	370	5	5	100	Include; default ALS LOR is appropriate
Cadmium	D	0.2	5	5	0.2	Include; default ALS LOR is appropriate
Chromium III	D	1	5	5	1	Include; default ALS LOR is appropriate
Chromium VI	D	1	5	2	1	Include; default ALS LOR is appropriate
Cobalt	D	1	2	5	0.2	Include; default ALS LOR is appropriate
Copper	D	1.4	5	2	1	Include; default ALS LOR is appropriate
Gallium	D	1*	2	5	0.001	Include; default ALS LOR is appropriate
Iron	D	100*	5	2	5	Include; default ALS LOR is appropriate
Lanthanum	D	1*	2	5	0.001	Include; default ALS LOR is appropriate
Lead	D	3.4	5	2	0.2	Include; default ALS LOR is appropriate
Manganese	D	1,900	2	2	0.5	Include; default ALS LOR is appropriate
Mercury	D	0.06	2	2	0.00004	Include; default ALS LOR is appropriate
Molybdenum	D	1	2	5	0.1	Include; default ALS LOR is appropriate
Nickel	D	8	5	2	0.5	Include; default ALS LOR is appropriate
Selenium	D	1	2	2	0.2	Include; default ALS LOR is appropriate
Silver	D	0.05	2	2	0.1	Include; default ALS LOR is appropriate
Thallium	D	1	2	2	0.1	Include; default ALS LOR is appropriate

Tin	D	0.001	2	2	5	Include; default ALS LOR is appropriate
Uranium	D	1	2	5	0.1	Include; default ALS LOR is appropriate
Vanadium	D	1	5	5	0.5	Include; default ALS LOR is appropriate
Zinc	D	8	5	2	5	Include; default ALS LOR is appropriate
Sodium	D	1,000*	2	2	1,000	Include; default ALS LOR is appropriate
Strontium	D	1	2	2	1	Include; default ALS LOR is appropriate
Potassium	D	1,000*	2	2	1,000	Include; default ALS LOR is appropriate
Calcium	D	1,000*	2	2	1,000	Include; default ALS LOR is appropriate
Magnesium	D	1,000*	2	2	1,000	Include; default ALS LOR is appropriate
Sulfates	D	1,000*	2	2	1	Include; default ALS LOR is appropriate
Chlorides	D	1,000*	2	5	1,000	Include; default ALS LOR is appropriate
pH	T	(Standard test)	5	5	0.01	Include; default ALS LOR is appropriate
Electrical Conductivity	T	(Standard test)	5	5	1 uS/cm	Include; default ALS LOR is appropriate
Total Suspended Solids	T	(Standard test)	5	5	5 mg/L	Include; default ALS LOR is appropriate
Turbidity	T	(Standard test)	5	5	0.1 NTU	Include; default ALS LOR is appropriate
Oxidation-Reduction Potential (ORP)	T	(Standard test)	5	5	0.1 mV	Include; default ALS LOR is appropriate
Total Hardness	D	(Standard test)	5	5	1,000	Include; default ALS LOR is appropriate
Oil and Grease	D	(Standard test)	5	5	5	Include; default ALS LOR is appropriate
Non-Metallic Inorganics					**mg/L**	
Ammonia	D	20	5	5	0.005 (5 ug/L)	Include; default ALS LOR is appropriate
Chlorine	D	3	2	2	0.2 (200 ug/L)	Include; default ALS LOR is appropriate
Cyanide	D	7	2	2	0.004 (4 ug/L)	Include; default ALS LOR is appropriate
Nitrate	D	700	5	5	0.002 (2 ug/L)	Include; default ALS LOR is appropriate
Total Nitrogen	D	0.5 (mg/L)	5	5	0.01 (10 ug/L)	Include; default ALS LOR is appropriate
Total Phosphorous	D	0.05 (mg/L)	5	5	0.005 (5 ug/L)	Include; default ALS LOR is appropriate
TKN	D	0.5	5	5	0.05 (5 ug/L)	Not an ANZECC Guideline analyte, propose accepting ALS LOR as indicative
Nitrite	D	1	5	5	0.002 (2 ug/L)	Not an ANZECC Guideline analyte,

						propose accepting ALS LOR as indicative
Hydrogen Sulfide	D	1	2	2	0.1 (100 ug/L)	Include; default ALS LOR is appropriate
Organics**						
TRH/BTEXN	D	600	5	2	TRH: 50-100 BTEXN: 1-20	Include; accept default ALS LORs as appropriate
VOCs (particularly Chloroform and 2,4-Dinitrophenol); (41 compounds including MAHs, THMs, Halogenated Aromatics, Naphthalene and MTBE)	D	1*	5	2	0.04-2	Include; default ALS LORs are generally appropriate
Organic Alcohols	D	1	2	2	50	Accept the ALS LOR as indicative initially, as presence of species is not probable, mainly used in industrial applications
Chlorinated Alkanes		100*	2	2	Test is not offered by ALS or similar labs	Exclude / Probability of site presence is low (http://www.toxipedia.org/display/toxipedia/Chlorinated+Paraffins; http://www.eurochlor.org/chlorinated-alkanes-(casg)/environmental-aspects.aspx)
Chlorinated Alkenes		10*	2	2	Test is not offered by ALS or similar labs	Exclude / Probability of site presence is low***
Anilines	D	3	2	2	2	Include; default ALS LOR is appropriate
Polycyclic Aromatic Hydrocarbons (PAHs)	D	16	2	2	0.5-1	Include; default ALS LOR is appropriate

Nitrobenzenes	D	100*	2	2	20	Include; default ALS LOR is appropriate
Nitrotoluenes	D	16	2	2	1	Include; default ALS LOR is appropriate
Chlorobenzenes and Chloronaphthalenes	D	3	2	2	0.1	Include; default ALS LOR is appropriate
Polychlorinated Biphenyls (PCBs) and Dioxins	D	0.01	2	2	PCB: 0.1 Dioxins: 5-100 pg/L	PCBs: Include / Accept ALS LORs as indicative, on the basis that the probability of a site presence is low, and ANZECC Guidelines have very little trigger data. Dioxins: Exclude / Low-probability presence, and high cost of analysis (~$1,300 per test); https://en.wikipedia.org/wiki/Polychlorinated_dibenzodioxins#Sources_of_dioxins; http://www.dioxinfacts.org/sources_trends/sources.html
Phenols and Xylenols	D	3	2	2	Phenols: 0.01-2 Xylenols are not offered by ALS or similar labs	Include Phenols / Indicative indicator; ALS LOR is sufficient for ANZECC trigger points. Exclude Xylenols / Low-probability presence; lab market does not readily analyse for this; http://www.merisol.com/images/PS_Summary_Xylenols_v1.pdf
Nitrophenols	D	45	2	2	0.01-0.1	Include; default ALS LOR is appropriate

Organic Sulfur Compounds		1*	2	2	Test is not offered by ALS or similar labs	Exclude / Low-probability presence, as uses seem to mainly be industrial and medicinal; lab market does not readily analyse for this.
Xanthates		1*	2	2	Test is not offered by ALS or similar labs	Exclude / Low-probability presence, mainly used in mining; lab market does not readily analyse for this.
Phthalates	D	9.9	2	2	2	Include / Accept default ALS LOR as appropriate for most, except Bis(2-ethylhexyl) phthalate (LOR of 10 ug/L)
Miscellaneous Industrial Chemicals						
Acetonitrile		10*	2	2	0.005 mg/L	Exclude / Low-probability presence, and high cost of analysis ($220 per test). https://en.wikipedia.org/wiki/Acetonitrile#Applications
Acrylonitrile		10*	2	2	1	Exclude / Low-probability presence, and high cost of analysis ($160 per test); https://en.wikipedia.org/wiki/Acrylonitrile#Uses
Poly(acrylonitrile-co-butadiene-costyrene)		530	2	2	Test not offered by ALS or similar labs	Exclude / Low-probability presence, lab market does not readily analyse for this; https://en.wikipedia.org/wiki/Acrylonitrile_butadiene_styrene#Applications
Dimethylformamide		10*	2	2	Test not offered by ALS or similar labs	Exclude / low-probability presence, lab market does not readily analyse for this; https://en.wikipedia.org/wiki/Dimethylf

						ormamide#Applications
1,2-diphenylhydrazine		10*	2	2	Test not offered by ALS or similar labs	Exclude / low-probability presence, lab market does not readily analyse for this; https://www.atsdr.cdc.gov/toxfaqs/tfacts136.pdf
Diphenylnitrosamine		10*	2	2	Test not offered by ALS or similar labs	Exclude / low-probability presence, mainly industrial and medicinal applications; lab market does not readily analyse for this; http://www.chemicalbook.com/ProductMSDSDetailCB7712443_EN.htm ; https://en.wikipedia.org/wiki/Nitrosamine#Uses ; https://pubchem.ncbi.nlm.nih.gov/compound/n-nitrosodiphenylamine#section=Top
Hexachlorobutadiene	D	10*	2	2	2	Include, with default ALS LOR
Hexachlorocyclopentadiene	D	10*	2	2	2	Include, with default ALS LOR
Isophorone (test cannot be done)		10*			Test is not offered by ALS or similar labs	Exclude / low-probability presence, lab market does not readily analyse for this; https://en.wikipedia.org/wiki/Isophorone#Uses
Pesticides, Herbicides, Fungicides, Rodenticides, Insecticides, etc**						
Organochlorine pesticides	D	0.01*	2	2	0.001	Include; default ALS LOR is appropriate

Organophosphorous pesticides	D	0.01*	2	2	0.05-0.1	Include / Low-probability presence, so propose to accept ALS LOR as indicative, as it is the same order as many of the compounds in question.
Carbamate and other pesticides		0.06			5-10,000	Include / Low-probability presence, so propose to accept ALS LOR as indicative
Pyrethroids	D	0.001	2	2	0.5	Include / Low-probability presence, so accept ALS LOR as indicative
Herbicides and Fungicides	D	0.1*	2	2	Herbicides: 0.01-0.1 Fungicide tests not offered by ALS or similar labs.	Include Herbicides / ALS LOR generally sufficient. Exclude Fungicides / low-probability presence, and test not offered by ALS or similar labs.
Generic Groups of Chemicals**						
Surfactants	D	100*	2	2	0.1	Include; default ALS LOR is appropriate
Oils and Petroleum Hydrocarbons		10*			Test not offered by ALS or similar labs	Exclude / Indications should be captured in Oil and Grease test, as well as TRH tests; lab market does not readily analyse for this
Oil Spill Dispersants		100*			Test not offered by ALS or similar labs	Exclude / Low-probability presence; lab market does not readily analyse for this

* Represents a preliminary, representative and conservative figure for the category, selected by Boral, for the purposes of ensuring that the selected laboratory test is sufficiently sensitive.

** Further details on the analytes, and types of analytes, required is specified in appropriate sub-section of Table 3.4.1 of the ANZECC 2000 Water Quality Guidelines.

*** https://books.google.com.au/books?id=hGY8jJEUiRYC&pg=PA40&lpg=PA40&dq=chlorinated+alkenes&source=bl&ots=0kbC3Iv5pP&sig=au-JFHE0JzoZjWl4smT4uokMk_U&hl=en&sa=X&ved=0ahUKEwiblJihlNzQAhXLNpQKHeGYDT8Q6AEIPjAF#v=onepage&q=chlorinated%20alkenes&f=false

DOC16/633154-01

Mr Jason Sweeny
State Manager, Recycling (NSW/ACT)
BORAL RECYCLING PTY LIMITED
39 Widemere Rd
WETHERIL PARK NSW 2164

EMAIL

Dear Mr Sweeny

Surface Water Characterisation Assessment – Potential Pollutants of Concern

On 12 December 2016 you submitted to the EPA your proposed approach to the Surface Water Characterisation Assessment which is required under condition U1.4 of the Licence. You also submitted a list of pollutants to be assessed. I am writing to you to provide the EPA's response to your proposed approach.

Proposed monitoring locations

The EPA agrees that Dam 2 is the water source that is critical to characterisation for the purposes of the pollution reduction program (PRP) and is the only data that is essential for presentation to the EPA.

Your letter states that: "*analysis of Prospect Creek may be useful for the purposes of better understanding the context of the site's surface water, and also potentially useful in determining any future discharge licence limits and/or trigger points*". The EPA will not consider the upstream and downstream data proposed to be collected for potential pollutants as these data are likely to represent wider catchment pollution. It does not provide an appropriate basis for determining environmental performance. The instream data that may be useful is related to any site-specific modifying factors that can affect the levels at which trigger values are set. For example data of water hardness can provide information to apply hardness modifying factors for specific metals where these factors are available, consistent with the ANZECC (2000) toxicant decision tree.

During the Response to Submission stage of the planning process, the EPA advised you with regard to the appropriate use of data from the receiving waters. We advised that the proposed upstream sampling sites are unlikely to represent suitable reference sites for the purpose of developing site specific trigger values or licence limits. Even if it was justified as a suitable reference site the data requirements in ANZECC (2000) for establishing site specific trigger values would not be met by the proposed monitoring.

Deriving site specific trigger values is recognised in the ANZECC (2000) guidelines. The derivation of site specific trigger values, however, must be consistent with the ANZECC (2000) methodology. For example for physical and chemicals stressors, this is done by calculating the 80th percentile values from a minimum of two years of contiguous data collected from appropriate reference sites. The reference sites must be selected consistent with the ANZECC (2000) methodology for deriving site specific trigger values.

In accordance with the ANZECC (2000) guidelines and NSW Water Quality Objectives, the level of protection that applies in most waterways is for a "*slightly to moderately disturbed system*". In the absence of appropriate reference conditions the ANZECC (2000) default trigger values should be used as a basis for developing discharge criteria.

The default trigger values in the ANZECC guidelines were derived from ecosystem data for unmodified or slightly modified ecosystems. To derive site-specific trigger values for a waterway with a slightly to moderately disturbed protection level it is therefore necessary to identify reference sites that are slightly modified. ANZECC (2000) states that: "*the reference condition should represent a substantial achievement in environmental protection that is agreeable to the majority of stakeholders*" and "*It is not acceptable to allow poor environmental performance or water pollution, simply because a waterway is degraded*".

Further information on the derivation of site specific trigger values is specified in the ANZECC guidelines, here: http://www.agriculture.gov.au/water/quality/guidelines; and general information on use of the ANZECC guidelines in NSW is provided in the document entitled: "*Using the ANZECC Guidelines and Water Quality Objectives in NSW*" see: http://www.epa.nsw.gov.au/Water_pollution/work.htm.

For the purposes of the PRP and establishing licence requirements it is recommended that upstream and downstream sampling is limited to potential modifying factors only e.g. water hardness.

Degree of Concentration Values

TRH/BTEXN

A required degree of concentration (RDC) value of 600µg/L has been adopted in Table 1 for TRH/BTEXN (this appears to be based on the Dutch 2000 Groundwater Intervention Value for Total Residual Hydrocarbons (TRH) C10-C40 which is not appropriate for discharges and it may relate to taking action for a contaminated site). A more appropriate value for comparative purposes may be to use the detection limit or make reference to trigger values for specific hydrocarbons, e.g. ANZECC (2000) trigger values for BTEX and PAHs. Further work will be required to establish appropriate discharge levels for any ongoing analytes based on total or combined analyte tests considering the impact of the range of hydrocarbons.

It is recommended that individual BTEXN analytes are sampled and reported against relevant ANZECC (2000) trigger values including those values available as reference values in Volume 2 of ANZECC (2000).

Nutrients

The RDC value for total nitrogen is given as 0.5 (mg/L) and the RDC value for total phosphorous is given as 0.05 (mg/L). The correct trigger value for total nitrogen is 0.35 mg/L and for total phosphorus 0.025 mg/L (ANZECC (2000), Table 3.3.2, Lowland River, footnote d).

Polycyclic Aromatic Hydrocarbons (PAHs)

The RDC value for PAHs is the ANZECC (2000) naphthalene trigger value. The trigger values for the other listed PAHs in ANZECC (2000) Table 3.4.1 should be taken into account based on the information in ANZECC (2000) volume 2 including the low reliability trigger values and potential for bioaccumulation.

Polychlorinated Biphenyls (PCBs) and Dioxins

All of the relevant trigger values in Volume 2 of ANZECC (2000) should be taken into account and referenced when reporting results.

Other analytes
Where there are not default trigger values in Table 3.4.1 of ANZECC (2000), all of the relevant trigger values or environmental concern levels for those analytes in Volume 2 (Detailed Description of Chemicals) of ANZECC (2000) should be taken into account and referenced when reporting results, recognising their application as interim or low reliability trigger values.

Proposed Minimum Number of Rounds of Testing – Dam 2

The proposed minimum of rounds of testing for a given analyte is generally acceptable. For those analytes that are proposed for only two rounds of testing, however, if a non-trivial result is recorded in those first two rounds of testing, then that analyte should be continued to be monitored for the full 5 rounds of sampling.

Analytes proposed for exclusion

The analytes proposed to be excluded from the sampling are accepted by the EPA.

If you have any questions regarding this matter, please contact Melissa Ward on 9995 5747.

Yours sincerely

22 December 2016
CELESTE FORETAL
Unit head Waste Compliance
Environment Protection Authority

Contact officer: MELISSA WARD
(02) 9995 5747

Appendix I

Emergency Response Plan

Emergency Response Plan

Widemere Recycling

Table of Contents

1. General Information

1.1 Forward

The aim of these procedures is to ensure that personnel are capable of coping with any emergency situation. The primary concern is for the safety of employees, visitors, contractors and the community. Vital records, property and other assets should also be protected.

Chief Wardens must ensure that these procedures are kept in a prominent position and that all personnel are made aware of the contents. It is also essential that this document is amended when there are site or personnel changes that impact on the procedures herein.

All personnel must make themselves aware of the location of all emergency alarms, exits and fire appliances within or near their work area and location of the external Safe Assembly Areas.

The effectiveness of these procedures depends on the willingness of all personnel to make themselves aware of the immediate actions they must take in an emergency so that they are capable of acting promptly, calmly and efficiently.

1.2 Emergency Response

A review of the risk assessment at Widemere Rd, Wetherill Park was conducted on 18 January 2012 by

- Tony Vella (Site Supervisor)
- Bob Mount (Trainor and Assessor)
- Alex Ajdinovic (HSE Advisor)

Risk Assessment Number 0001, which has the proposed emergency response to each situation is attached to this plan as Appendix A.

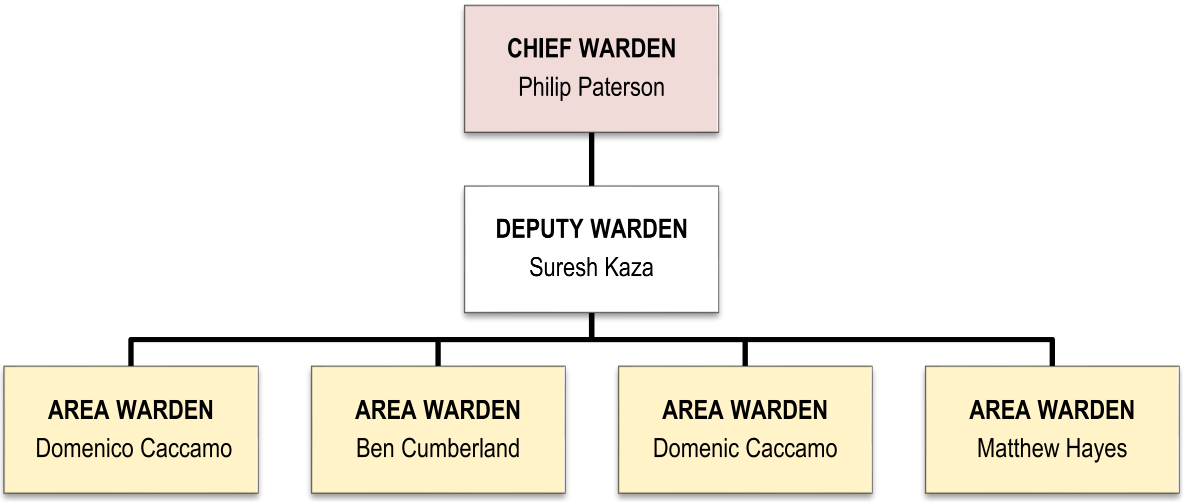
Ongoing reviews are undertaken following drills and or incidents.

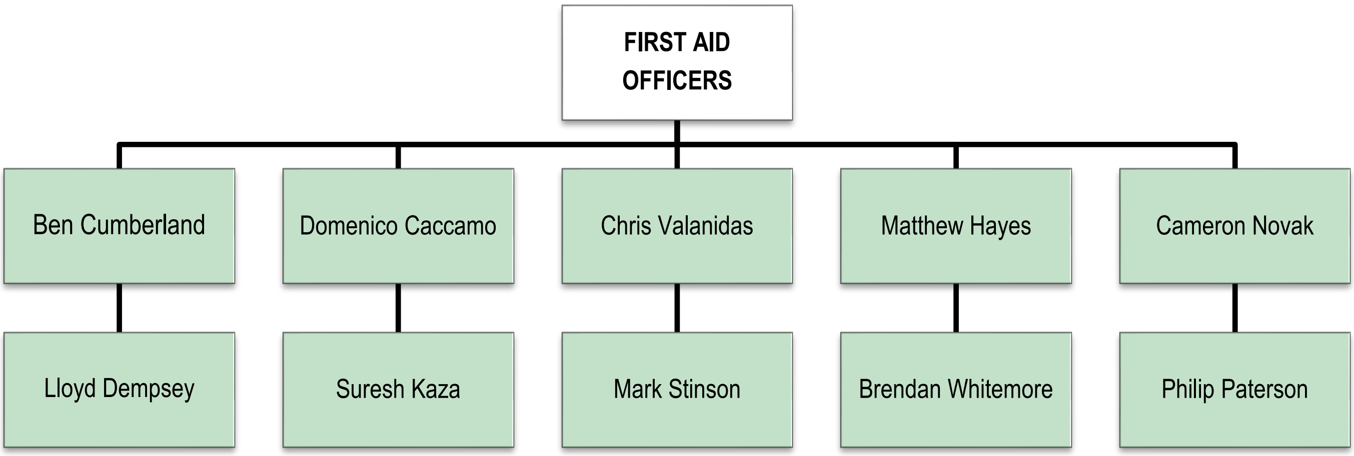
1.3 Emergency Preparedness Checklist

Checks of emergency preparedness must be undertaken using the **General Workplace Safety Inspection Checklist HSEQ -7-08-F03**, which checks for emergency lighting, fire extinguishers, flammable materials etc.

2. Control and Coordination

2.1 Control Organisation





2.2 Control Personnel Identification Helmets

Helmet Colour	Role	# Issued
Red	Chief Warden	
Yellow	Area Warden	
Yellow	Deputy Warden	
Green	First Aiders	

2.3 Manual Distribution

Emergency Manual Location	Number of Copies
Administration	
Chief Warden	
Area Warden	
Deputy Warden	
Workshop	
Reception	
Total	

2.4 Main Control Staff and Wardens

Hours of Operation

Monday – Saturday	6am to Midnight
Sunday	6am to 6pm

After Office Hours Contact Details

Philip Paterson	0401 894 227
Suresh Kaza	0401 892 727

Emergency Appointment	Emergency Control Organisation (ECO)	Stand-in Control Staff (if ECO absent)
Chief Warden	Philip Paterson Recycling Manager 0401 894 227	Suresh Kaza Site Supervisor 0401 892 727
Deputy Warden	Suresh Kaza Site Supervisor 0401 892 727	Domenico Caccamo Leading Hand
Area Warden	Domenico Caccamo Leading Hand	Lloyd Dempsey Leading Hand
Area Warden	Lloyd Dempsey Leading Hand	Cameron Novak or Chris Valanidas Stand In Leading Hand

2.5 Important Notes

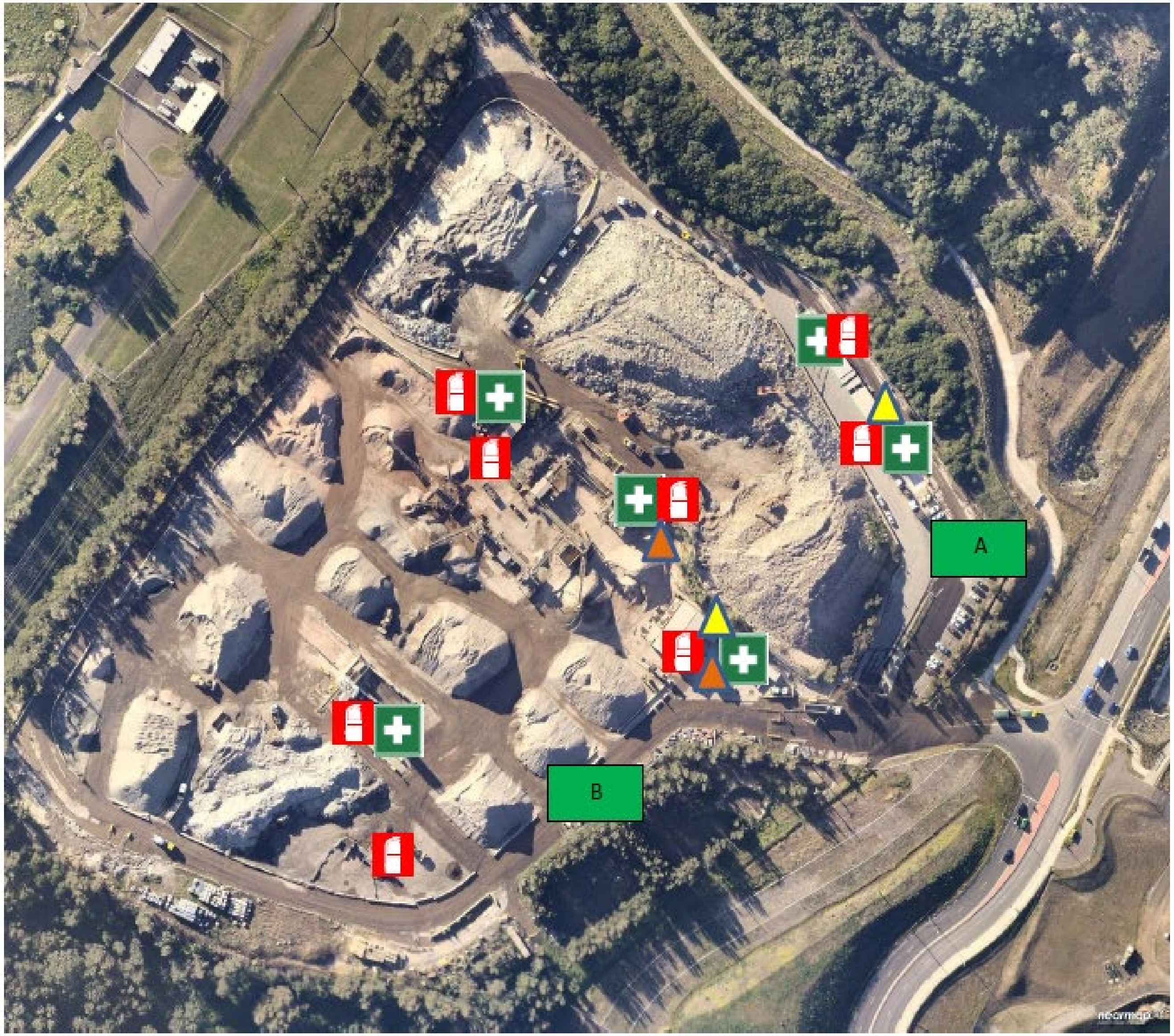
i) Principal Control Staff must take charge of their designated responsibilities when on site.

ii) Stand-in Control Staff must take charge of their designated responsibilities when the Principal Control Staff are not on site.

iii) It is imperative that all personnel are aware of the immediate actions they must take in a Fire/Smoke and Cardiac Arrest/Medical Emergency.

2.6 Site Plan

The following is a site aerial plan showing the general layout of the site including offices, key buildings, warehouses, entrances and exits, hazards and dangerous goods storage, evacuation routes and emergency assembly areas, and emergency equipment. More than one plan may be required.



Legend

🟩 Emergency Assembly area

✚ First Aid

🟥 Fire Extinguisher

△ Spill Kits

▲ Emergency shower or eye wash

2.7 Hazardous and Dangerous Goods

The Hazardous and Dangerous Goods Register is located in the MSDS Folder in the Weighbridge Office.

2.8 Emergency Services

Contact details for emergency services for the site:

Emergency Service	Contact Numbers	Who Contacts
Fire Brigade	000	Communication Officer
Police	000	Communication Officer
Blacktown Local Area Command	9671 9199	Communication Officer
Ambulance	000	Communication Officer
Fairfield Hospital	9616 8111	Communication Officer
Wetherill Park Occupational Health	9756 1344	Communication Officer
Environmental Protection Authority (EPA)	13 15 55	Communication Officer
Poisons Information	13 11 26	Communication Officer
Electricity (Mains)	13 10 03	Communication Officer
Electricity (Concept Engineering)	4861 6955	Communication Officer
Water	13 20 90	Communication Officer
Telstra	13 20 00	Communication Officer
Unified Security	1300 658 657	Communication Officer
WorkCover (Regulator)	13 10 50	Site Manager/Chief Warden

3. General Emergency Requirements

In the event of an emergency the process to follow shall include:

- Make area safe
- If safe to do so, provide assistance to injured persons
- Notify Chief Warden on two-way radio or by phone
- Await further instructions

4. Action Plans

4.1 Fire and Smoke

If you discover fire or smoke on site, follow the steps below immediately.

Step 1: Advise your Front Line Supervisor or Area Warden immediately of the fire or smoke and its location on the site.

Step 2: Front Line Supervisor or Area Warden to move any people in immediate danger to the Safe Assembly Area, and advise the Chief Warden immediately of the fire or smoke and its location on site.

Step 3: The Chief Warden will assess the situation and, if deemed appropriate, evacuate the site and notify emergency services.

FOR EVACUATION

To alert all employees and visitors of evacuation, a siren or other suitable warning system i.e. two way radio/CB radio will be sounded by the Chief Warden. Area Wardens will instruct all personnel to EVACUATE.

Step 4: Area Wardens must ensure that their designated areas are free of all personnel.

If safe to do so, Area Wardens will switch off power to machines and other equipment, and close doors in accordance with specific site emergency procedures. Do not turn off the lights.

If safe to do so, the fire may be extinguished.

Step 5: For evacuation, all personnel must assemble at the designated Assembly Points (refer to Site Map) and remain with their Area Warden at All times.

Step 6: Each Area Warden will conduct a roll call to account for all employees and visitors.

Step 7: First Aid Attendants will treat any injured personnel at the Assembly Point.

Step 8: Await further instructions.

Do not re-enter the site until the Chief Warden gives the all clear

FIRE AND SMOKE – CHIEF WARDEN RESPONSIBILITIES

When notified of emergency and location:

- Proceed to the danger area and assess the situation.
- Where deemed necessary, evacuate personnel from the site. If evacuation is ordered, ensure plant is stopped.
- Initiate the evacuation by sounding the siren.
- For evacuation, confirm that all personnel are being moved to the Safe Assembly Points.
- Advise the emergency services and neighbouring companies as necessary.
- If safe to do so, try to extinguish the fire.

- Collect the Employee Evacuation Checklist and the Visitor Register from reception and proceed to the Safe Assembly Point.
- Conduct a roll call of all employees and visitors. Note any unaccounted for personnel and initiate a search (where safe to do so).
- Ensure that all other immediate and follow-up actions have been taken or are in progress.
- Ensure that ‘NO ENTRY’ signs are positioned correctly.
- Ensure that Chief Fire Officer is met.
- Hand the situation over to the Chief Fire Officer on arrival and advise them of:
    - Any unaccounted for personnel
    - The latest situation and actions taken
- Await instructions from Chief Fire Officer.

FIRE AND SMOKE – AREA WARDEN RESPONSIBILITIES

- Assist the Chief Warden of any smoke or fire you have been alerted to, and its location.
- Ensure a ‘sweep’ of your designated area is completed and that all personnel are moved to the Safe Assembly Point.
- The Area Warden must also do a check of the despatch office, service office, finished goods, toilets and lunch rooms.
- The Office Area Warden must also do a check of the production office, visitor register, toilets, lunch room, accounts and service office.
- Confirm that all doors, windows and hatches have been closed to contain fire and block off smoke.
- Confirm that the alarm has been activated and that emergency services have been advised of details and location.
- Nominated Area Wardens must ensure that ‘NO ENTRY’ signs are positioned correctly.
- Report any personnel not accounted for to the Chief Warden.

IF SAFE TO DO SO AND AS DIRECTED BY CHIEF WARDEN

- Assist in extinguishing fires.
- Shut down or switch off gas, air conditioning, machines and appliances. Leave lights on.
- Try to limit contaminated emissions.

FIRE AND SMOKE – FIRST AID ATTENDANT RESPONSIBILITIES

- Collect the First Aid Kit, as appropriate.
- Act under instructions from the Area Warden or Chief Warden.
- Be prepared to render first aid as requested by the Area Warden or Chief Warden, or as required.
- Bomb threats and other threats.

4.2 Bomb Threats

In all cases of bomb threat:

WARNING

SWITCH OFF RADIOS, CELLULAR PHONES, MOBILE PHONES, PAGERS OR ANY OTHER RADIO TRANSMITTING DEVICES

USE LINE TELEPHONES ONLY

BOMB THREATS BY TELEPHONE – IMMEDIATE ACTION

- Record all information on paper.
- Let caller finish the message; do not interrupt.
- If asked for a response, keep your answer to one or two words.
- Try to attract the attention of people near you.
- Be sympathetic (do not abuse the caller).
- Claim that you cannot hear the caller.
- Ask for the caller to repeat parts of the conversation.
- **Do not hang up**.

IMMEDIATELY AFTER THE CALLER HANGS UP

- Report to the Chief Warden.
- Await further instructions.

BOMB THREATS BY MAIL – IMMEDIATE ACTION

- Take careful note of the time and method of receipt.
- Retain the item but limit handling to a minimum and handle by edges only.
- Notify the Chief Warden and provide details.
- Do not discuss details of the threat with any other person.
- Await further instructions.

BOMB THREATS IN PERSON – IMMEDIATE ACTION

- Evaluate the person making the threat:
    - Has the person made a complaint against your organisation?
    - Did they appear to be under the influence of alcohol or drugs?
    - Was the threat made in a facetious or joking manner?
- Make note of the appearance of the person(s) making the threat.

- When the person has departed, report the threat to Chief Warden.
- Remain with the Chief Warden for interview by Police.
- Do not discuss details of the threat with the media or any other person.
- Await further instructions.

BOMB THREAT – CHIEF WARDEN RESPONSIBILITIES

- Assess information from the recipient of the threat.
- Initiate an evacuation of the premises, if deemed necessary.
- Ensure that the Police have been advised of details.
- Ensure that the recipient has completed the Bomb Threat Checklist 45-F04 and is standing by for interview.
- If directed by the Crisis Team, initiate Area Warden searches and ensure that search results are reported to Chief Warden
- Commence an evacuation as necessary:
    - Ensure that all personnel are evacuated and accounted for, and that 'NO ENTRY' signs are positioned correctly.
- Stand by for further advice from the Crisis Team and Police.

When advised by Police, start to re-enter the premises

4.3 Personal Threat – Immediate Response

Contact the Site/Operations Manager immediately upon receiving any personal threat.

4.4 Extortion – Immediate Response

Contact the Site/Operations Manager immediately upon receiving any extortion threat.

4.5 Response to Other Emergencies

The main concern is the safeguarding of life and immediate treatment of injured people. If safe to do so, vital records and equipment should also be protected.

The following instructions are aimed at preparing staff to cope with any of the following emergencies:

- Toxic emission – leakage of flammable or toxic gases, liquids or materials.
- Explosion – spill.
- Building collapse – trapped person.
- A warning is received of an external disaster which may threaten the safety of staff and/or visitors.
- Any other immediate internal or external occurrence or incident which you consider requires immediate emergency action.

THE IMMEDIATE RESPONSE IS:

- Move people in immediate danger to safety, and ensure their continued safety and care.
- Shut down or switch off plant. **LEAVE LIGHTS ON**.
- Report details to the Area Warden or Chief Warden immediately.
- Restrict access to the area.
- Care for injured personnel.
- Await instructions from the Area Warden or Chief Warden.
- Stand by to provide assistance, and await further instructions.
- For detailed instructions with regards to specific emergency situations, see Section 5.

The first responsibility of all personnel is quickly move anyone in immediate danger to safety and ensure that they are accounted for by the Warden

When in doubt … EVACUATE

5. Stages of Evacuation

Stage 1 – Immediate	Move away from immediate danger
Stage 2 – Total	Total evacuation of the premises

5.1 Evacuation Assessment

Assessment to evacuate is done by the Chief Warden in consultation with Area Wardens

Factors which must be immediately considered to determine stages and priorities are as follows:

- Location and extent of the emergency.
- The proximity of flammable gases, liquids and other flammable materials or suspect item (in the case of a bomb threat).
- If there has been a toxic emission, evacuation must be kept away from direction of emission and wind.
- If fire incident: Whether it is safe to try to extinguish the fire or block off smoke, or whether the initial attack on the fire looks like it will be successful.
- The nature and type of any injuries sustained by people in the danger area and whether those present are capable of evacuating all people in danger.
- The nearest safe exit route.

5.2 Evacuation All-Clear

Entry or re-entry is strictly forbidden until authorised by the Officer-in-Charge of the attending emergency authority. If no emergency authority is in attendance, entry or re-entry is forbidden until the Chief Warden gives the all clear and the Site/Operations Manager authorises re-entry.

5.3 Evacuation Checklist

The following checklist is to be compiled for each evacuation area, and maintained by the Area Warden responsible for each respective area.

An up-to-date EVACUATION CHECKLIST will all details of current employees is kept at reception in the EVACUATION FOLDER.

These must be done by each Area Warden and details given to the Chief Warden at the time of the evacuation.

Employee Evacuation Checklist		
Boral Widemere Recycling		
Chief Warden: Philip Paterson		
Employee	**At Safety Assembly Point**	**Missing**
Ben Cumberland		
Cameron Novak		
Chris Valanidas		
Daniel Finnie		

David Eades		
Domenico Caccamo		
Domenic Caccamo		
George Ritete		
Haseeb Popal		
Mark Stinson		
Matthew Hayes		
Peter Young		
Steven Vella		
Tony Flippin		
Tracey Tjahjadi		
Brendan Whitmore		
Dean Pafitis		
Ian Peti		
John Davies		
Lloyd Dempsey		
Manu Moala		
Stephen Iby		
Suresh Kaza		

5.4 Record of Copies Issued

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6. Other Emergency Situations

Emergency situations which may be applicable:

6.1 Extreme Weather Events

Emergency Procedure	***Extreme Weather Events***
What happened?	*Cyclone, earthquake, hail, lightning, storm, dust storm.*
Immediate response	1. Ensure safety of those in the vicinity of the area. 2. Call emergency services. 3. Follow emergency evacuation procedure to EAA, if safe to do so. 4. If emergency evacuation area unsafe, take shelter in a nearby secure dwelling. This secondary shelter must be chosen on the basis of the emergency at hand. 5. Monitor weather alerts from the Bureau of Meteorology (http://www,bom.gov.au/) and maintain contact with local emergency services for updates.
Further response	1. Protect the area around as best as possible. 2. Try to evacuate site if possible, if not, find a safe place for all personnel. 3. Wait for emergency services.
Who is in charge?	The Chief Warden is in charge of this type of incident until relieved by emergency services.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Site firefighting equipment such as extinguishers ▪ First aid kit ▪ Emergency supplies, such as drinking water ▪ Site communication devices
Resuming operations	▪ Clearance to be obtained from emergency services ▪ Area made safe

6.2 Flood

Emergency Procedure	***Flood***
What happened?	*Any incident involving flooding on site.*
Immediate response	1. If flooding is imminent, Chief Warden shall monitor Bureau of Meteorology alerts via http://www.bom.gov.au/australia/flood/ 2. Should flooding threaten the site, Chief Warden will determine when evacuation is necessary. 3. If evacuation and site closure is necessary and employees are able to vacate using their own transport, site will be closed and employees advised to evacuate via Widemere Rd exit. 4. Put life jackets on. 5. If Widemere Rd exit has flooded and egress via personal vehicles is not possible, personal vehicles may be parked on Concrete Plant raw materials pad. 6. Emergency egress using heavy vehicles will be considered based on water levels and risk. If heavy vehicle egress is required, persons will be transported to a waiting vehicle on the highway ramp to Widemere Rd, which will transport persons to the secondary emergency assembly area. A warden will be station at the traffic lights to account for all persons evacuated. The first person to be evacuated must take with them a copy of the employee evacuation checklist.
Further response	1. Energy to the site will be isolated if possible. 2. Pontoon and other floating equipment to be secured. 3. Chemicals to be secured if possible. 4. Site gates shall be closed.
Who is in charge?	The site Chief Warden is in charge of this type of incident.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Portable first aid kit(s) ▪ Site communication devices ▪ Portable firefighting equipment ▪ Isolation equipment (e.g. locks) ▪ Life jackets
Resuming operations	This type of incident may require regulator notification and regulator approval may be needed before resuming operations. Contact HSE Advisor or Manager to confirm. ▪ Commence internal incident investigation ▪ Equipment damaged by the incident will require inspection by a suitably qualified person after repair and before returning it to service. ▪ Risk assessments of equipment involved in the incident will require review prior to returning equipment to service ▪ Critically damaged equipment may require replacement

6.3 Drowning

Emergency Procedure	***Drowning***
What happened?	*Any incident involving someone falling into a water source on site.*
Immediate response	1. Where possible, use the provided rescue ring, a rope, a pole or other means of rescuing the person without entering the water yourself. **Note.** Panicking swimmers can accidentally drown their rescuers. 2. If the person is conscious, help them to relax and proceed to Step 4. If they are unconscious, commence CPR in accordance with Step 3 and have someone call for help. 3. Conduct CPR in accordance with your training and/or the posters mounted at the water source. 4. As soon as practicable, report the details to the Chief Warden and/or Deputy Warden. Advise what resources are required to manage the emergency.
Further response	1. The Chief Warden will send additional first aid or other resources to the incident scene. 2. The Chief Warden will send a person to the entry gate to meet and direct emergency services. 3. Any person who has potentially inhaled water shall be transported to medical facilities for assessment/monitoring. First aid treatment/monitoring is required until the ambulance arrives.
Who is in charge?	The Chief Warden is in charge of this type of incident.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Portable first aid kit(s) ▪ Rescue ring or equivalent at the water source ▪ CPR posters at the water source ▪ Life jackets
Resuming operations	This type of incident may require regulator notification and regulator approval may be needed before resuming operations. Contact HSE Advisor or Manager to confirm. ▪ Commence internal incident investigation ▪ BEAP counselling shall be offered (if required) ▪ The structure of the water source (e.g. dam walls) may require inspection by a suitably qualified person prior to returning it to service. ▪ Risk assessments of drowning will require review prior to returning the water source to service.

6.4 Bushfire

Emergency Procedure	***Bushfire***
What happened?	*Any incident involving a bushfire, regardless of the size.*
Immediate response	1. Assess the situation. Listen to local radio station or www.rfs.nsw.gov.au for warnings about bushfires in the area 2. Advise Chief Warden of imminent bushfires and follow all instructions 3. Do not attempt to stay and defend against extreme and catastrophic rated bushfires
Further response	1. If safe to do so, shut down any affected equipment 2. The Chief Warden will determine what, if any, level of evacuation is required 3. The Communication Officer will advise all persons to stay clear of the incident site 4. The Chief Warden will send an Area Warden to the entry gate to meet and direct the fire brigade, if applicable.
Who is in charge?	The Chief Warden is in charge of this type of incident until relieved by the fire brigade.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Portable first aid kit(s) ▪ Site communication devices ▪ Portable firefighting equipment ▪ Isolation equipment (e.g. locks)
Resuming operations	This type of incident may require regulator notification and regulator approval may be needed before resuming operations. Contact OHS Advisor or Manager to confirm. ▪ Commence internal incident investigation ▪ Equipment damaged by the incident will require inspection by a suitably qualified person after repair and before returning it to service ▪ Risk assessments of equipment involved in the incident will require review prior to returning the equipment to service ▪ Critically damaged equipment may require replacement

6.5 Fixed or Mobile Plant Fire

Emergency Procedure	***Fixed or Mobile Plant Fire***
What happened?	*Any fire which requires the use of a fire extinguisher or other emergency response. Examples include fires caused by hot work or fuel operated equipment.*
Immediate response	1. Assess the scene: Is it safe to attempt to extinguish the fire? If safe, proceed to Step 2, if not proceed to Step 3 2. If safe, attempt to extinguish the fire using equipment provided. Whether successful or not, proceed to Step 3 3. Move to a safe place and report the details to the Chief Warden and/or Deputy Warden. Advise what resources are required to manage the emergency, including fire brigade, if necessary
Further response	1. If safe to do so, shut down any affected equipment 2. The Chief Warden will determine what, if any, level of evacuation is required 3. The Communication Officer will advise all persons to stay clear of the incident site 4. The Chief Warden will send an Area Warden to the entry gate to meet and direct the fire brigade, if applicable.
Who is in charge?	The site Chief Warden is in charge of this type of incident until relieved by fire brigade.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Site firefighting equipment such as extinguishers ▪ Site communication devices
Resuming operations	This type of incident may require regulator and insurer notification. Regulator approval may be needed before resuming operations. Contact OHS Advisor or Manager to confirm. ▪ Commence internal incident investigation, including alcohol and other drug testing of persons involved ▪ Equipment damaged by the incident will require inspection by a suitably qualified person after repair and before returning it to service ▪ Critically damaged equipment may require removal from site and replacement

6.6 Explosion

Emergency Procedure	***Explosion***
What happened?	*Any incident involving rapid release of pressure, gas, heat or material in a sudden and violent manner.*
Immediate response	1. Evacuate to pre-determined area. 2. Assess cause and effect of incident and call 000 if required. 3. If possible, isolate and shut down supply of electricity/gas/material inflow and outflow. 4. Secure area, which may include fighting of small fires, using spill kits to stop spread, or locking down area to prevent spread of fumes/fire. 5. Recue injured/trapped person if safe to do so, if required.
Further response	1. Area Warden to meet emergency services at front gate. 2. Follow emergency services instructions.
Who is in charge?	The Chief Warden is in charge of this type of incident.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Portable first aid kit(s) ▪ Site communication devices ▪ Portable firefighting equipment ▪ Isolation equipment (e.g. locks)
Resuming operations	This type of incident may require regulator notification and regulator approval may be needed before resuming operations. Contact OHS Advisor or Manager to confirm. ▪ Commence internal incident investigation ▪ Equipment damaged by the incident will require inspection by a suitably qualified person after repair and before returning it to service ▪ Risk assessments of equipment involved in the incident will require review prior to returning the equipment to service ▪ Critically damaged equipment may require replacement

6.7 Fixed Plant Structural Failure

Emergency Procedure	***Fixed Plant Structural Fire***
What happened?	*Major plant incident, including failure of plant or equipment or collapse of structures.*
Immediate response	1. Call emergency services if required 2. Move to a safe place and report the details to the Chief Warden and/or Deputy Warden. Advise what resources are required to manage the emergency. 3. Evacuate to safe assembly location 4. Provide first aid to injured persons within level of competence
Further response	1. Account for all personnel 2. Cordon off access to site until emergency services arrive 3. The Chief Warden will send a person to the entry gate to meet and direct emergency services, if applicable 4. Notify emergency services if any person is missing 5. Provide any assistance required by emergency services
Who is in charge?	The site Chief Warden is in charge of this type of incident until relieved by emergency services.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Personnel list ▪ First aid kit ▪ Site communication devices
Resuming operations	This type of incident may require regulator and insurer notification. Regulator approval may be needed before resuming operations. Contact OHS Advisor or Manager to confirm. ▪ Commence internal incident investigation ▪ Equipment damaged by the incident will require inspection by a suitably qualified person after repair and before returning it to service ▪ Critically damaged equipment may require removal from site and replacement ▪ Clearance to be given by emergency services prior to entry into the area

6.8 LV Electric Shock

Emergency Procedure	***LV Electric Shock***
What happened?	*Any incident involving an electric shock, regardless of the size.*
Immediate response	1. Report the details to the Chief Warden. Advise what resources are required to manage the emergency, including emergency services 2. Assess the scene. Where is the source of electricity? Is it Low Voltage? If no, see HV Electric Shock Procedure. 3. Put on insulated gloves 4. Isolate electricity and place sign on isolator. Do not enter the incident scene until you have confirmed that the power has been isolated/disconnected. Contact energy supplier if required to isolate power to the site 5. Use crook to separate person from power source 6. Once safe, provide assistance (e.g. first aid, firefighting, additional electrical isolation)
Further response	1. The Chief Warden will send additional resources to the incident scene 2. The Chief Warden will organise for additional isolation/disconnection. 3. The Communication Officer will advise all other persons to stay clear of the scene via two-way radio 4. The Chief Warden will send a person to the entry gate to meet and direct emergency services 5. The Chief Warden will determine whether evacuation is required. Refer to Procedure 6 of the Site Emergency Response Plan. 6. Any person who suffered an electric shock shall be transported to medical facilities for assessment/medical treatment. This may include an ECG based on medical advice
Who is in charge?	The site Chief Warden is in charge of this type of incident.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Portable first aid kit(s) ▪ LV rescue kit ▪ Site communication devices ▪ Portable firefighting equipment ▪ Isolation equipment (e.g. locks)
Resuming operations	This type of incident may require regulator notification and regulator approval may be needed before to resuming operations. Contact OHS Advisor or Manager to confirm. ▪ Commence internal incident investigation ▪ Equipment damaged by the incident will require inspection by a suitably qualified person after repair and before returning it to service ▪ Risk assessments of equipment involved in the incident will require review prior to returning the equipment to service ▪ Critically damaged equipment may require replacement

6.9 HV Electric Shock

Emergency Procedure	***HV Electric Shock***
What happened?	*Any incident involving an electric shock, regardless of the size.*
Immediate response	1. Report the details to the Chief Warden. 2. Assess the scene. Do not enter the incident scene until you have confirmed that the power has been isolated/disconnected. 3. Call "'000'" 4. Contact energy supplier if required to isolate power to the site 5. Once safe, provide assistance (e.g. first aid, firefighting, additional electrical isolation)
Further response	1. The Chief Warden will send additional resources to the incident scene 2. The Chief Warden will organise for additional isolation/disconnection 3. The Communication Officer will advise all other persons to stay clear of the scene via two-way radio 4. The Chief Warden will send a person to the entry gate to meet and direct emergency services 5. The Chief Warden will determine whether evacuation is required. Refer to Procedure 6 of the Site Emergency Response Plan 6. Any person who suffered an electric shock shall be transported to medical facilities for assessment/monitoring. This may include an ECG based on medical advice
Who is in charge?	The site Chief Warden is in charge of this type of incident.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Portable first aid kit(s) ▪ Site communication devices ▪ Portable firefighting equipment ▪ Isolation equipment (e.g. locks)
Resuming operations	This type of incident may require regulator notification and regulator approval may be needed before to resuming operations. Contact OHS Advisor or Manager to confirm. ▪ Commence internal incident investigation. ▪ Equipment damaged by the incident will require inspection by a suitably qualified person after repair and before returning it to service ▪ Risk assessments of equipment involved in the incident will require review prior to returning the equipment to service

6.10 Vehicle Contact with Overhead Electrical Cables

Emergency Procedure	***Vehicle Contact with Overhead Electrical Cables***
What happened?	*Any incident involving an electric shock, regardless of the size.*
Immediate response	1. If mobile plant contacts overhead Powerlines, do not leave cabin, or change the position of controls until the all clear has been given by an electrician or the Chief Warden 2. Whilst remaining within the cabin of the mobile plant, the operator will need to avoid touch with metallic surfaces. If possible to isolate mobile plant from within cabin, do so 3. Contact Chief Warden to report incident 4. Chief Warden to warn persons to secure the area to a minimum of 10 metres around the accident scene 5. Where the operator has no option but to leave the mobile plant they are to avoid touching both the ground and the mobile plant at the same time. This will mean that the operator will need to perform a controlled jump clear of the mobile plant from the step closest to the ground and move away by keeping feet pressed together and hopping from the accident scene to the minimum clearance of 10 metres
Further response	1. The Chief Warden will send additional resources to the incident scene 2. The Chief Warden will organise for additional isolation/disconnection 3. The Communication Officer will advise all other persons to stay clear of the scene via two-way radio 4. The Chief Warden will send a person to the entry gate to meet and direct emergency services 5. The Chief Warden will determine whether evacuation is required. Refer to Procedure 6 of the Site Emergency Response Plan 6. Any person who suffered an electric shock shall be transported to medical facilities for assessment/medical treatment. This may include an ECG based on medical advice
Who is in charge?	The site Chief Warden is in charge of this type of incident.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Portable first aid kit(s) ▪ Site communication devices ▪ Portable firefighting equipment ▪ Isolation equipment (e.g. locks)
Resuming operations	This type of incident may require regulator notification and regulator approval may be needed before to resuming operations. Contact OHS Advisor or Manager to confirm. ▪ Commence internal incident investigation ▪ Equipment damaged by the incident will require inspection by a suitably qualified person after repair and before returning it to service ▪ Risk assessments of equipment involved in the incident will require review prior to returning the equipment to service

	- Critically damaged equipment may require replacement

6.11 On Site Road/Rail Incident

Emergency Procedure	***On Site Road/Rail Incident***
What happened?	*Any on-site vehicle collision incidents, including single vehicle, vehicle to vehicle and vehicle to train.*
Immediate response	1. Assess the scene. What appears to have happened? Is there risk of escalation (e.g. fire, explosion, further roll over or people being struck by other vehicles)? 2. If safe to do so, approach and provide assistance (e.g. provide first aid, assist people in climbing out of vehicle(s), assist in firefighting, and determine if emergency services are required) 3. As soon as practicable, report the details to the Chief Warden and/or Deputy Warden. Advise what resources are required to manage the emergency, including emergency services, if necessary.
Further response	1. The Chief Warden will send additional first aid or other resources to the incident scene 2. The Communication Officer will advise all drivers on site to stay clear of the accident site 3. The Chief Warden will send a person to the entry gate to meet and direct emergency services.
Who is in charge?	The site Chief Warden is in charge of this type of incident until relieved by emergency services (if required).
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	- Portable first aid kit(s) - Site communication devices - On board and portable firefighting equipment - Hi-visibility clothing
Resuming operations	This type of incident may require regulator notification and regulator approval may be needed before resuming operations. Contact the OHS Advisor or OHS Manager ASAP to determine if this is required. The following actions must be carried out in accordance with the requirements of the SAP MSMP, including those defined in the site Traffic Management Plan and controls identified through risk assessment. - Commence internal incident investigation - BEAP counselling shall be offered (if required) - The Project Site Manager may approve temporary alternate traffic flows - Vehicles may require retrieval/recovery. - Critically damaged vehicles may require lifting and/or removal from site

6.12 Off Site Road Incident

Emergency Procedure	***Off Site Road Incident***
What happened?	*Any off-site road incident that involves vehicles going to or heading away from Widemere.*
Immediate response	1. Assess the scene. What appears to have happened? Is there risk of escalation (e.g. fire, explosion, people being struck by other vehicles)? 2. Call emergency services (if required) 3. Move vehicles to a safe location if possible 4. Put out traffic management equipment 5. If safe to do so, approach and provide assistance (e.g. provide first aid, help people walk to a safer place) 6. Notify Widemere Recycling Site Manager
Further response	1. If safe to do so, the site Chief Warden may provide resources to assist in managing the scene including first aiders, the Communication Officer and any qualified traffic controllers 2. The site Chief Warden shall assign Area Warden(s) to prevent unauthorised access (e.g. drivers attempting to find a way around the accident if unsafe to do so) 3. All non-essential deliveries to and from site should be postponed
Who is in charge?	The site Chief Warden is in charge of site access and the allocation of site resources. The police or, in their absence, other relevant emergency services are in charge of the incident scene, once they arrive at the scene.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Traffic management triangles ▪ Portable first aid kit(s) ▪ Fire extinguisher ▪ High visibility clothing
Resuming operations	▪ BEAP counselling shall be offered (if required) ▪ Resume normal deliveries to and from site once all clear has been given by emergency services

6.13 Pedestrian Struck by Vehicle

Emergency Procedure	***Pedestrian Struck by Vehicle***
What happened?	*Any on-site incident involving a pedestrian being struck by any vehicle. For off-site vehicle-pedestrian incidents refer to SEP1.*
Immediate response	1. Assess the scene. What appears to have happened? Is there risk of escalation (e.g. rescuers being struck by other vehicles)? 2. When safe to do so, approach and provide assistance (e.g. provide first aid and determine if emergency services are required). Avoid moving the injured person 3. As soon as practicable, report the details to the Chief Warden and/or Deputy Warden. Advise what resources are required to manage the emergency, including ambulance, if necessary
Further response	1. The Chief Warden will send additional first aid or other resources to the incident scene 2. The Communication Officer will advise all drivers on site to stay clear of the incident site via two-way radio 3. The Chief Warden will send a person to the entry gate to meet and direct the ambulance
Who is in charge?	The site Chief Warden is in charge of this type of incident.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Portable first aid kit(s) ▪ Site communication devices
Resuming operations	This type of incident may require regulator notification and regulator approval may be needed before resuming operations. Contact OHS Advisor or Manager to confirm. The following actions must be carried out in accordance with the requirements of the SHPSMP, including those defined in the site Traffic Management Plan and controls identified through risk assessment. ▪ Commence internal incident investigation, including alcohol and other drug testing of persons involved ▪ BEAP counselling shall be offered (if required) ▪ The Site Manager may approve temporary alternate traffic flows ▪ Vehicles may require retrieval/recovery

6.14 Serious Injury

Emergency Procedure	*Serious Injury*
What happened?	*A serious injury (not dealt with by a specific SEP) which requires emergency treatment.* *Refer to SEP3 for Electric Shock, SEP4 for Drowning, SEP5 for Fall from Height, SEP6 for Snake or Spider Bite or SEP7 for Pedestrian Struck by Vehicle.*
Immediate response	1. Call "000" if emergency services are required 2. Assess the scene. What appears to have happened? Is there risk of escalation (e.g. further injury to the patient or rescuers)? 3. Make the scene safe (e.g. shutdown and isolate equipment, stop traffic etc.) 4. Once safe, approach and provide assistance (e.g. provide first aid, assist people in moving out of the incident scene) 5. As soon as practicable, report the details to the Chief Warden and/or Deputy Warden. Advise what resources are required to manage the emergency, including emergency services, if necessary
Further response	1. Keep the person calm 2. The Chief Warden will send additional site emergency resources to the incident scene 3. The Communication Officer will advise all drivers on site to stay clear of the accident site via two-way radio 4. The Chief Warden will send a person to the entry gate to meet and direct emergency services 5. Provide additional standard first aid, as required. The patient shall be treated/monitored by a first aider until the ambulance arrives
Who is in charge?	The site Chief Warden is in charge of this type of incident until relieved by emergency services.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Portable first aid kit(s) ▪ Site communication devices
Resuming operations	Serious incidents require regulator notification and approval before resuming operations. Contact the OHS Advisor or Manager to confirm requirements. ▪ Commence internal incident investigation ▪ BEAP counselling shall be offered (if required)

6.15 Medical Emergency

Emergency Procedure	***Medical Emergency***
What happened?	*Any incident involving a life threatening health event.*
Immediate response	1. Call "000" 2. Keep area clear of unnecessary people 3. Check Medical Conditions Report to determine if there may be an underlying medical issue 4. Perform first aid 5. Area Warden to meet emergency services at front gate 6. Keep person comfortable until emergency services arrive
Further response	1. Return Medical Conditions Report to locked file 2. Debrief those who witnessed incident 3. Ensure counselling is offered via the BEAP service
Who is in charge?	The site Chief Warden is in charge of this type of incident.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Portable first aid kit(s) ▪ Site communication devices
Resuming operations	▪ Site operations may have halted whilst person received first aid and medical treatment. ▪ Operations may resume once they no longer have effect on providing medical treatment

6.16 Mental Health Issues

Emergency Procedure	***Mental Health Issues***
What happened?	*Any incident involving a person's mental health, including but not limited to mental breakdown, psychosis, self-harm, attempted suicide.*
Immediate response	**1.** If there is an immediate threat to you, or someone else, contact emergency services "000" 2. **If there is an immediate risk to the physical health of a person and** emergency medical attention is required, contact "000" and advise of situation. This may include situations where the person has caused or is threatening to cause severe physical harm to themselves (e.g. overdose) **3.** Where there is potential for disruption of operations, or where operations may inflame situation, Chief Warden will cease operations 4. The Communication Officer will advise all other persons to stay clear of the scene via two-way radio 5. The Chief Warden will send a person to the entry gate to meet and direct emergency services, if required 6. Chief Warden will assess the need to shut down operations while incident being attended to
Further response	1. Chief Warden will assess situation and evacuate if necessary 2. Debrief those who are involved or witnessed incident 3. Ensure counselling is offered via the BEAP service.
Who is in charge?	The site Chief Warden is in charge of this type of incident.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Portable first aid kit(s) ▪ Site communication devices
Resuming operations	▪ Clearance to be obtained from emergency services ▪ Area made safe

6.17 Falling in Harness Rescue

Emergency Procedure	***Falling in Harness Rescue***
What happened?	*Any incident involving the arrest of someone's fall using a harness.* *(Note: A task-specific rescue plan shall be developed and reviewed before issuing the High Risk Permit for any work at heights which involves the use of a fall arrest set up. This SEP is meant to complement these specific plans.)*
Immediate response	1. Initiate the task specific rescue plan 2. Call emergency services 3. Immediately report the details to the Chief Warden and request additional first aid support if required
Further response	1. Timely rescue and expert care is critical in avoiding suspension trauma. Therefore the Chief Warden will have emergency rescue services and an ambulance called. If on-site rescue is immediately successful, external rescue resources can be notified of success 2. Unless rescue is immediate, attempts must be made to avoid blood pooling in the victims legs and preventing oxygen flow. If the suspended person is unconscious, proceed to Step 3, otherwise encourage them to: a. Move out of a vertical position, b. Use their leg muscles, and c. Remain calm and avoid strenuous activity as this creates a higher oxygen demand and may result in them fainting 3. If the person is unconscious, efforts should be made to raise their legs into a sitting position by looping rope, or equivalent, under their knees 4. Once rescued, standard first aid shall be provided. The person shall be treated/monitored by a first aider until the ambulance arrives
Who is in charge?	The site Chief Warden is in charge of this type of incident until relieved by emergency services.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Predetermined rescue equipment ▪ Portable first aid kit(s) ▪ Site communication devices
Resuming operations	This type of incident may require regulator notification and regulator approval may be needed before resuming operations. Contact OHS Advisor or Manager to confirm. ▪ Commence internal incident investigation ▪ The harness and other fall arrest equipment shall be permanently taken out of service (but not initially destroyed, until approved by external investigators) ▪ The anchor point used shall be taken out of service until certified as fit for reuse

6.18 Confined Space Rescue

Emergency Procedure	***Confined Space Rescue***
What happened?	*Person in confined space has collapsed or injured themselves and requires rescue.*
Immediate response	1. Assess the scene and notify first aid and emergency services (if required) 2. Notify Chief Warden. Advise what resources are required to manage the emergency, including fire brigade, if necessary i.e. what type of confined space is present and what the perceived emergency is 3. Follow rescue plan 4. DO NOT enter confined space unless fitted with self-contained breathing apparatus, communication device to standby person, torch and tethered, and a qualified confined space rescue standby person is present. 5. Retrieve injured person using lifeline or harness
Further response	1. Conduct first aid on person once removed, if necessary 2. The Chief Warden will send a person to the entry gate to meet and direct emergency services, if applicable
Who is in charge?	The site Chief Warden is in charge of this type of incident until relieved by emergency services.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Lifeline or harness retrieval equipment ▪ Self-contained breathing apparatus ▪ Means to ventilate area before entering if required ▪ Gas detector ▪ Site communication devices ▪ Torch
Resuming operations	This type of incident may require regulator and insurer notification. Regulator approval may be needed before resuming operations. Contact OHS Advisor or Manager to confirm. ▪ Commence internal incident investigation ▪ Area to be made safe before entering

6.19 Exposure to Chemicals

Emergency Procedure	***Exposure to Chemicals***
What happened?	*Person exposed to chemicals; on their skin, inhalation, ingestion.*
Immediate response	1. Remove person from chemical source if safe to do so (follow SDS if unsure) **Note.** SDS available via ChemAlert 2. Contact "000" 3. For skin exposure put person under continuous stream of cool water for a minimum 15 - 20min and remove ALL affected clothing ASAP 4. For inhalation remove them to an unaffected area and monitor their breathing 5. For ingestion call poisons information line for first aid requirements, follow their instruction 6. Consider use of gas detector for constant monitoring of atmosphere to ensure safe levels
Further response	1. Only provide first aid to your level of competence 2. Apply appropriate first aid, depending on type of exposure 3. Wait for ambulance to transport worker to hospital 4. Ensure MSDS is sent with worker to hospital
Who is in charge?	The site Chief Warden is in charge of this type of incident until relieved by emergency services.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ PPE ▪ MSDS ▪ First aid kit ▪ Cold running water ▪ Site communication devices
Resuming operations	This type of incident may require regulator and insurer notification. Regulator approval may be needed before resuming operations. Contact OHS Advisor or Manager to confirm. ▪ Commence internal incident investigation ▪ Area to be made safe

6.20 Environment - Major Spills

Emergency Procedure	***Environment – Major Spills***
What happened?	*A major spill of distillate, oil or chemical on site during delivery, or on site.*
Immediate response	1. Shut down dispenser – prevent further release of spill 2. If spill presents a danger to employees, activate alarm 3. Use sand or absorbent materials to contain 4. Block the flow to stormwater drains or water sources 5. Advise Chief Warden about incident and what resources are required to manage the emergency
Further response	1. If spill has entered stormwater drain or water sources, seek to block down stream 2. Clean up contaminated sand, soil or absorbent material, place in drums or appropriately stockpile to dispose of 3. The Chief Warden will send a person to the entry gate to meet and direct the emergency services, if applicable
Who is in charge?	The site Chief Warden is in charge of this type of incident.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Spill kits or absorbent materials near all dispensing and storage locations ▪ Appropriate signage erected to identify materials ▪ Site communication devices
Resuming operations	▪ Clearance given by emergency services ▪ Area made safe

6.21 Ground Instability

Emergency Procedure	***Ground Instability***
What happened?	*Any incident involving a vehicle rollover, or vehicle submersion.*
Immediate response	1. If mobile plant rolls over on site, incident should be reported to Chief Warden 2. Assess the situation and contact emergency services if required. If unable to exit the vehicle safely, operator should be instructed to remain in cabin with seatbelt on until help arrives 3. If vehicle has become submerged, Chief Warden to organise defibrillator and life jackets to be brought to incident scene 4. All operations to cease to allow free passage of emergency vehicles to incident location 5. Conduct first aid as required until arrival of emergency services
Further response	1. Conduct first aid on person once removed, if necessary 2. The Chief Warden will send additional resources to the incident scene 3. The Communication Officer will advise all other persons to stay clear of the scene via two-way radio 4. The Chief Warden will send a person to the entry gate to meet and direct emergency services
Who is in charge?	The site Chief Warden is in charge of this type of incident.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Portable first aid kit(s) ▪ Site communication devices ▪ Portable firefighting equipment ▪ Isolation equipment (e.g. locks) ▪ Spill kits
Resuming operations	This type of incident may require regulator notification and regulator approval may be needed before to resuming operations. Contact OHS Advisor or Manager to confirm. ▪ Commence internal incident investigation ▪ Equipment damaged by the incident will require inspection by a suitably qualified person after repair and before returning it to service ▪ Risk assessments of equipment involved in the incident will require review prior to returning the equipment to service ▪ Critically damaged equipment may require replacement. The site is not to be disturbed and no plant or equipment moved until assessed or approved by the regulator

6.22 Stockpile Slumping

Emergency Procedure	***Stockpile Slumping (Material Engulfment)***
What happened?	*Any incident involving stockpile slumping, engulfing persons or plant containing persons.*
Immediate response	1. Assess the scene and notify first aid and emergency services (if required) 2. Notify Chief Warden. Advise what resources are required to manage the emergency, including fire brigade, ambulance etc. 3. Check for hazards including further stockpile undercutting prior to rescue 4. Retrieve engulfed person from stockpile using appropriate tools
Further response	1. Conduct first aid on person once removed, if necessary 2. The Chief Warden will send a person to the entry gate to meet and direct the ambulance, if applicable
Who is in charge?	The site Chief Warden is in charge of this type of incident.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Portable first aid kit(s) ▪ Site communication devices ▪ Portable firefighting equipment ▪ Isolation equipment (e.g. locks) ▪ Hand tools/HME for digging ▪ Other appropriate equipment
Resuming operations	This type of incident may require regulator notification and regulator approval may be needed before resuming operations. Contact OHS Advisor or Manager to confirm. ▪ Commence internal incident investigation ▪ Assess material stability and similar areas onsite for potential

6.23 Snake or Spider Bite

Emergency Procedure	*Snake or Spider Bite*
What happened?	*Any incident involving a bite from a snake or spider.* *(Note: While it is helpful to identify the snake or spider, it is not absolutely required for the use of modern anti-venom. Therefore do not risk your safety by trying to catch or kill the animal.)*
Immediate response	1. Ensure the snake or spider is no longer within striking distance before attempting to assist the injured person 2. Do <u>not</u> wash the wound site, tourniquet the limb or attempt to suck out the venom. Take care to avoid touching/transferring the venom onto yourself 3. Apply a compression bandage on the bite site, in accordance with first aid training. Note: Pain from Redback spider bites often prevents the use of pressure, in which case apply ice 4. Immediately report the details to the Chief Warden and request an ambulance 5. If possible, take note of the colour and appearance of the snake or spider for identification purposes
Further response	1. Immobilise the affected area with a compression bandage and keep the patient calm 2. Lay the person down and keep them calm. Do not give food or drink – although the occasional small sip of cool water is ok while waiting for the ambulance 3. Provide additional standard first aid, as required. The patient shall be treated/monitored by a first aider until the ambulance arrives
Who is in charge?	The site Chief Warden is in charge of this type of incident.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Portable first aid kit(s) ▪ Compression bandages or snake bite kit (if available) ▪ Site communication devices
Resuming operations	▪ As required, contact professional snake removal / pest treatment ▪ Commence internal incident investigation

6.24 Personal Threat

Emergency Procedure	*Personal Threat*
What happened?	*Personal threat may include threat of assault, assault, armed holdup, or robbery.*
Immediate response	1. Remain calm 2. Alert someone to the threat if possible 3. Remove yourself to a safe area if possible 4. Contact police/ambulance.
Further response	1. Observe offenders characteristics 2. Record as many details as possible once the threat has been removed 3. The Chief Warden to coordinate debriefing/counselling for staff (BEAP)
Who is in charge?	The site Chief Warden is in charge of this type of incident until relieved by emergency services.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Site communication devices
Resuming operations	This type of incident may require regulator and insurer notification. Regulator approval may be needed before resuming operations. Contact the OHS Advisor or Manager to confirm. ▪ Commence internal incident investigation ▪ Area made safe ▪ External authorities to release site back to Chief Warden

6.25 Civil Disorder

Emergency Procedure	***Civil Disorder***
What happened?	*Any incident involving civil disorder with the potential to disrupt site operations or access, regardless of the size.*
Immediate response	1. If civil disorder threatens to disrupt site operations or access to the site, report the issue immediately to the Chief Warden 2. The Chief Warden shall contact line management and HR Department 3. The Chief Warden should determine whether it is safe for operations to continue and persons can gain access to the site. 4. If it is unsafe for operations to continue the site shall be closed and secured 5. All persons should remain clear of situations where personal threat is present 6. If required, management should contact emergency services and implement a safe evacuation procedure
Further response	1. Senior line management may need to contact the Boral media department depending on the size of the incident and potential outcomes 2. HR should be kept informed of changes in the situation 3. The Boral crisis team may require notification
Who is in charge?	The site Chief Warden is in charge of this type of incident.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Portable first aid kit(s)
Resuming operations	This type of incident may require regulator notification and regulator approval may be needed before to resuming operations. Contact OHS Advisor or Manager to confirm. ▪ Commence internal incident investigation ▪ Equipment damaged by the incident will require inspection by a suitably qualified person after repair and before returning it to service ▪ Critically damaged equipment may require replacement

6.26 Bomb Threat

Emergency Procedure	***Bomb Threat***
What happened?	*Bomb threat or suspect mail received at the site. Refer to Section 5 for details.*
Immediate response	1. Record all information regarding threat, do not interrupt and do not hang up 2. Respond only if asked to. Keep answers to one or two words 3. Ask questions to get more information: when, where, what, why, name, address 4. Report threat to Chief Warden ASAP 5. Notify Site/Operations Manager (if unavailable leave message and continue with Step 6) 6. Call emergency services 7. Follow evacuation procedure 8. Wardens put "No Entry" signs on all entrances
Further response	1. Follow directions of emergency services 2. Person who took call to stand by for interview
Who is in charge?	The site Chief Warden is in charge of this type of incident until relieved by emergency services.
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Site communication devices
Resuming operations	This type of incident may require regulator and insurer notification. Regulator approval may be needed before resuming operations. Contact OHS Advisor or Manager to confirm. ▪ Commence internal incident investigation ▪ BEAP counselling shall be offered (if necessary). ▪ Site to be given clearance by emergency services before returning. ▪ Area to be made safe.

6.27 Plane Crash

Emergency Procedure	***Plane Crash***
What happened?	*Any on-site plane crash.*
Immediate response	1. Contact Chief Warden and emergency services 2. Assess the scene. What appears to have happened? Is there risk of escalation (e.g. fire, explosion, further roll over or people being struck by other vehicles)? 3. If safe to do so, approach and provide assistance (e.g. provide first aid, assist people in climbing out of vehicle(s), assist in firefighting
Further response	1. The Chief Warden will send additional first aid or other resources to the incident scene 2. The Communication Officer will advise all drivers on site to stay clear of the accident site 3. The Chief Warden will send a person to the entry gate to meet and direct emergency services
Who is in charge?	The site Chief Warden is in charge of this type of incident until relieved by emergency services (if required).
Who to call	*Upon identifying this type of emergency, urgently contact:* Chief Warden (Site Manager) – **Philip Paterson** 0401 894 227 Deputy Warden – **Suresh Kaza** 0401 892 727 Deputy Warden – **Domenico Caccamo** UHF CH20, UHF CH01 (Internal) Emergency Services 000 Ambulance (if necessary) 000
Emergency equipment required	▪ Portable first aid kit(s) ▪ Site communication devices ▪ On board and portable firefighting equipment ▪ Hi-visibility clothing
Resuming operations	This type of incident may require regulator notification and regulator approval may be needed before resuming operations. Contact the OHS Advisor or OHS Manager ASAP to determine if this is required. The following actions must be carried out in accordance with the requirements of the SAP MSMP, including those defined in the site Traffic Management Plan and controls identified through risk assessment. ▪ Commence internal incident investigation ▪ BEAP counselling shall be offered (if required) ▪ The Project Plant Supervisor may approve temporary alternate traffic flows. ▪ Vehicles may require retrieval/recovery. ▪ Critically damaged vehicles may require lifting and/or removal from site

Appendix A: Site Risk Assessment

Appendix J

Pollution Incident Response Management Plan

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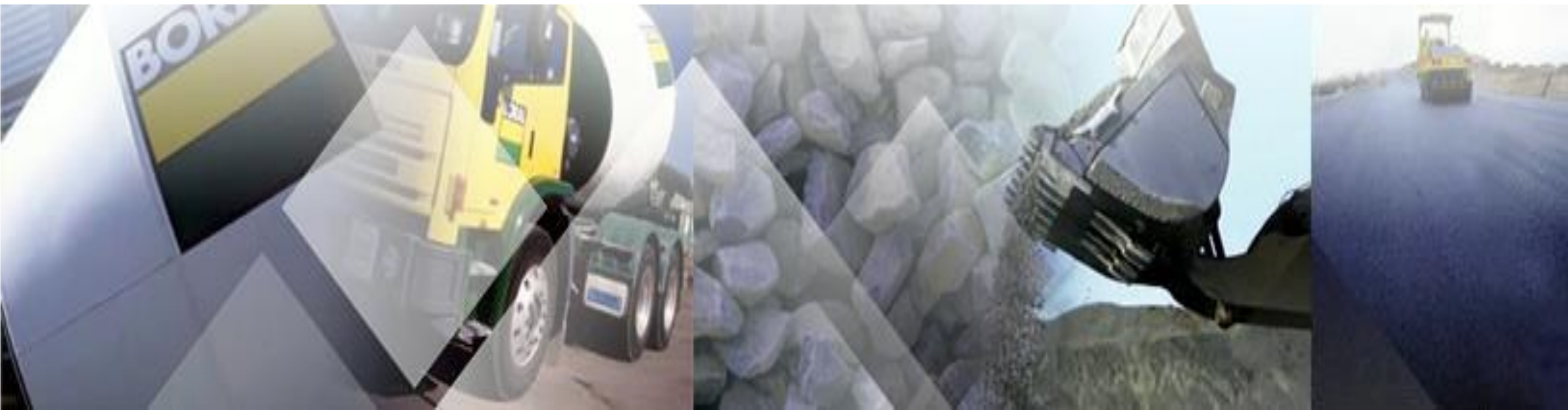
Pollution Incident Response Management Plan

WIDEMERE RECYCLING

Version Eight: 13th March 2017



DOCUMENT CONTROL SHEET

Rev.	Date	Prepared by	Approved By	Revision Details
01	20 Aug 2012	Rod Johnson	Rod Johnson	Document Created
02	11 Dec 2012	Patrick Boyce	Rod Johnson	Site visit Customisation of document
03	10 Apr 2013	Patrick Boyce	Rod Johnson	Document re-format
04	14 Aug 2013	Philip Paterson	Philip Paterson	PIRMP Drill Updated details
05	08 Sep 2014	Philip Paterson	Philip Paterson	PIRMP Drill Updated details
06	14 August 2015	Philip Paterson	Philip Paterson	Updated details
07	15 March 2016	Philip Paterson	Philip Paterson	Updated details
08	13 March 2017	Philip Paterson	Greg Johnson	Updated personnel details Updated risk ratings Added relevant HSEQ references Added new maps / aerials

Current Rev.	Date Implemented	PIRMP Test Schedule	Date for Next Review
08	13 March 2017	12 months	13 March 2018

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1. PURPOSE

The purpose of the Widemere Recycling Pollution Incident Response Plan is to:

- Provide direction to the staff at Widemere Recycling in responding to pollution incidents at the Widemere operations;

- Ensure timely communication about a pollution incident is provided to staff at the premises, the Environment Protection Authority (EPA), other relevant authorities specified in the Protection of the Environment Legislation Amendment Act (POELA Act) (including Fairfield City Council, NSW Ministry of Health, Work Cover NSW, and Fire and Rescue NSW) and persons outside the operations who may be affected by the impacts of a pollution incident;

- Minimise and control the risk of a pollution incident at Widemere Recycling by identifying key risks and planned actions to minimise and manage those risks;

- Detail the training requirements for this plan, identifying persons responsible for implementing it, and ensuring that the plan is regularly tested for accuracy, currency and suitability.

2. LEGISLATIVE REQUIREMENTS

The specific requirements for a PIRMP are set out in Part 5.7A of the POEO Act and the Protection of the Environment Operations (General) Regulation 2009 (POEO(G) Regulation). In summary, this provision requires the following:

- All holders of environment protection licences must prepare a pollution incident response management plan (section 153A, POEO Act).

- The plan must include the information detailed in the POEO Act (section 153C) and be in the form required by the POEO(G) Regulation (clause 98B).

- Licensees must keep the plan at the premises to which the environment protection licence relates (section 153D, POEO Act).

- Licensees must test the plan in accordance with the POEO(G) Regulation (clause 98E).

- if a pollution incident occurs in the course of an activity so that material harm to the environment is caused or threatened, licensees must immediately implement the plan (section 153F, POEO Act)

3. DEFINITION OF 'POLLUTION INCIDENT'

The definition of a pollution incident is:

> *"pollution incident means an incident or set of circumstances during or as a consequence of which there is or is likely to be a leak, spill or other escape or deposit of a substance, as a result of which pollution has occurred, is occurring or is likely to occur. It includes an incident or set of circumstances in which a substance has been placed or disposed of on premises, but it does not include an incident or set of circumstances involving only the emission of any noise."*

A pollution incident is required to be notified if there is a risk of 'material harm to the environment', which is defined in section 147 of the POEO Act as:

a) harm to the environment is material if:

  i. it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or

ii. it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000 (or such other amount as is prescribed by the regulations), and

b) loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment.

Widemere Recycling is now required to report pollution incidents immediately to the EPA, NSW Health, Fire and Rescue NSW, WorkCover NSW and the local council.

4. SCOPE

This PIRMP must be followed by employees, contractors and visitors of Widemere Recycling, to assist in the early response to and reporting of a pollution incident.

5. POTENTIAL POLLUTING SUBSTANCES

The main hazards to human health and the environment at Widemere Recycling are included in the following table.

<table>
<tr><th colspan="8">LIST OF POLLUTING SUBSTANCE STORAGES/USES AT SITE: INITIAL ASSESSMENT
(all Chemicals listed in this sheet are to be subjected to a risk assessment)</th></tr>
<tr><td colspan="6">Site Name:
Widemere Recycling</td><td colspan="1">Responsible Person:
Adrian Preece</td><td>Date:
13/03/17</td></tr>
<tr><td>Name / description</td><td>Covered under Hazardous Chemicals/MSDS?</td><td>Amount stored</td><td>Location of storage</td><td>Map reference</td><td>Need for early warning[1]</td><td>Current controls</td><td>See Risk Ass & PIRMP Response Action (see Below)</td></tr>
<tr><td colspan="8">CHEMICALS/FUELS/LUBRICANTS (raw materials and products which can cause pollution)</td></tr>
<tr><td>Diesel</td><td>Class 3</td><td>2 tanks: 12,500 litres and 9,500 litres</td><td>Diesel Storage Area, and sales area (west of workshop)</td><td>Ref No #1 and #2</td><td>N/A</td><td>• Bunding (including rollover bund)
• Roofed
• PMP
• Training
• Spill Kits
• SOP
• Inductions
• Fire Fighting Equipment
• Security</td><td>Incident #1-3</td></tr>
<tr><td>Oils/Solvents, Lubricants</td><td>Class 3</td><td>Packaged goods up to ~100 litres</td><td>Oil Storage Shed at Workshop</td><td>Ref No #3</td><td>N/A</td><td>• Bunding
• PMP
• Training
• Flammable Cabinet
• Spill Kits
• Inductions
• Fire Fighting Equipment
• Security</td><td>Incident #4</td></tr>
<tr><td>Gases</td><td>Class 2</td><td>Variable</td><td>Workshop</td><td>Ref No #3</td><td>N/A</td><td>• Fire Extinguishers
• Concrete Floor</td><td>Incident #4</td></tr>
</table>

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[1] Early warnings relate to informing neighbours who may be affected by the emission of this substance. If this substance is of a type and quantity which may reach neighbours then early warning assessment of actions is required to be undertaken.

						- Enclosed Shed - Containment Cages and Cabinets	
Oils	Class 3	~2000L	Plant and Equipment (Workshop area). Shipping container.	Ref No #3	N/A	- Bunded Area - PMP - Training - Spill Kits - SOP - Inductions - Fire Fighting Equipment - Security	Incident #4
Acid	Class 3	1000 litres capacity	pH Treatment Plant	Ref No #4	N/A	- PMP - Training - Spill Kits - SOP - Inductions - Bunding	Incident #4
MATERIALS (eg stockpiles, silos, bulk solids etc)							
Aggregate Stockpiles	N/A	Variable	Dedicated on site	Ref No #5 & #6	N/A	- Water sprays - Water cart - Maintain manageable levels - Security	Incident #5
Cement	N/A	3 silos, each with capacity of 55T	Stabilization Plant	Ref No #7	Yes	- High level alarm - Auto closure - Pressure relief valve - Filtered air ducted - Preventative maintenance	Incident #6
AQUEOUS (eg dams, wastewater tanks, other water storage area)							
Water Storage Dam (Sediment)	N/A	Variable		Ref No #8	N/A	- Continue to use for dust suppression - Ensure pumps are	Incident #7

						maintained through scheduled maintenance • Discharge monitoring	
Storm Water Drains	N/A	Variable	Site	N/A	N/A	• Straw Bales • Rubber and Earthen Berms • Audits and Inspections	Incident #7
SUBSTANCES IN PROCESSES (substances which could be emitted from operational process i.e. treatment plants, vehicles etc)							
Name / description	**Covered under Hazardous Chemicals/MSDS?**	**Amount stored**	**Location of storage**	**Map reference**	**Need for early warning[2]**	**Current controls**	**See Risk Ass & PIRMP Response Action (see Below)**
Mobile Plant (Boral)	Class 3	Variable	Dedicated on site	N/A	N/A	• Spill Kits • Pre start checks • PMP • Training	Incident #8
Mobile Plant (Contractor/visitor)	Class 3	Variable	Variable Locations	N/A	N/A	• Spill Kits • Training • Inductions	Incident #9
Car Parking up to 37 vehicles	Class 3	Variable	Site Office	Ref No #9	N/A	• Spill Kits • Training	Incident #10
Traffic Areas (dust, chem. leaks & loss, material drag-out)	Class 3	N/A	Dedicated on site	N/A	N/A	• Training • Water cart • Spill Kits • Traffic management • Wheel wash • Street sweeper	Incident #11

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[2] Early warnings relate to informing neighbours who may be affected by the emission of this substance. If this substance is of a type and quantity which may reach neighbours then early warning assessment of actions is required to be undertaken.

6. ROLES AND RESPONSIBILITIES

Position	Responsibility
Employees and Contractors	Following the procedures outlined in the PIRMP and related documents. Immediately alerting Supervisor or Team Leader of any environmental incidents or near-misses.
Team Leaders / Front Line Supervisors	Following the procedures outlined in the PIRMP and related documents. Immediately alerting Site Manager or, in case of their unavailability, Environmental Representative or Environment Manager of any potentially material environmental incidents or near-misses. Conducting incident investigations.
Site / Operations Manager and/or Site Environmental Coordinator and/or Environment Manager	Authorisation of the PIRMP Administration, maintenance and implementation of the PIRMP Assessing whether the incident has caused or threatens "material environmental harm" and, if so, immediately notifying all Appropriate Regulatory Authorities. Ensuring that investigations are undertaken to a level corresponding to the level of risk and impact.

7. INTERNAL POLLUTION INCIDENT REPORTING

Any pollution incident satisfying the ***material harm*** threshold must be immediately reported to relevant statutory authorities by either the Site/Operations Manager, or Environment Manager.

In cases where “material harm” level cannot be immediately assessed or insufficient information comes to hand on the severity of the incident, the general advice is to err on the side of caution and notify the Relevant Authorities with a qualification that the situation could not yet be fully assessed.

Until further notice the following procedure needs to be followed:

1. When a pollution incident occurs, a person who has become aware of it must immediately bring it to the attention of his/her immediate Supervisor or Manager
2. If necessary, first ring “ 000 ” for Emergency Services
3 At least one of the following BCM personnel must be contacted **immediately**:

Name	Function	Phone number	Mobile number
David Simpson	Operations Manager- NSW/ACT	02 9604 9101	0401 892 097
Adrian Preece	Site Manager	02 9604 9101	0401 894 981
Philip Paterson	Site Supervisor	02 9604 9101	0401 894 227
Matt Wright	Site Supervisor	02 9604 9101	0401 894 909
Michelle King	HSE Advisor- NSW/ACT		0401 893 203
Greg Johnson	Environment Manager- NSW/ACT	02 9033 4916	0401 893 420

4. David Simpson or in case of his unavailability one of the Senior Management personnel listed above, is to **immediately** notify all Appropriate Regulatory Authorities specified in Section 4.3.
5. In borderline situations, where the exceedance of the trigger level of “material harm” of a pollution incident may not be clear, a quick assessment including consultation with

Boral environmental personnel should be undertaken to help the decision whether to notify or not.

6. Boral's Senior Management must be informed promptly of the fact of immediate notification to the Authorities. This includes environmental personnel listed above, as well as David Bolton, Greg Price and Richard Strauch.

8. EXTERNAL POLLUTION INCIDENT REPORTING

As the legislation requires that notification must be done immediately upon becoming aware of the pollution incident, it is unlikely that a detailed picture will be available for reporting. Notwithstanding, is seems that some of the Government Authorities prepared a detailed questionnaire which is being filled at the time of this initial notification. Under the stress of incident handling it could be easy to provide a hasty, inaccurate estimate of the situation when answering these questions.

Therefore, the notification should be restricted to the facts known and nothing should be assumed or guessed. The details will be provided to the asking Authority later when more information comes to hand.

The initial notification should include as much of the following information (if known) as possible:

- location and time of the pollution incident
- type of the incident (spill, fire, unlicensed harmful discharge, etc)
- assessed level of incident gravity: "it seems to be…" (e.g. "a relatively minor spill"; "major fire", "explosion limited to one building", etc.)
- whether the Emergency Services have been required to attend.

Unless known for a fact, the answers to other questions should be politely deferred until a better assessment of the situation can be made.

The Boral person who is responsible for notifying the Authorities (Site/Operations Manager or Environment Manager) about the incident must prepare a Notification Log (a suitable form is attached) with the details of time of notifications and the persons who took to the call. The Authorities are expected to log the calls but early indications are that this is not always the case.

Notification of all Appropriate Government Authorities (at least 5 entities) may take considerable time. Delays may be experienced connecting to the right person or no contact may be possible after hours. All such instances should be recorded in the Notification Log.

9. POLLUTION INCIDENT AUTHORITY CONTACT LIST

Government Authority - compulsory notifications	**Emergency notification phone number**
EPA – Environment Line	131 555
Fire and Rescue NSW (FRNSW)	1300 729 579
Fairfield City Council	9725 0222
Public Health Unit (Sydney West AHS) – Parramatta NC PHU	HealthLink (24 hr)- 1800 063 635 Head Office - Parramatta – 9840 3603
WorkCover Authority of NSW	131050 Company ABN if asked: 51 000 187 002
Government Authority - ring if relevant	**Emergency notification phone number**
Police & Ambulance	000
Roads and Maritime Services (road spills)	132 701
NSW Office of Water	8838 7885
Bush Fire Control Officer	1800 049 933
Poisons Information Centre	131 126
Endeavour (power line emergencies)	13 23 91

Communication with the local community may also be undertaken depending on the circumstances of the pollution incident. Widemere Recycling would consider the following options for providing Early Warning and ongoing information to the community on pollution incidents:

- Direct phone contact with any local residents directly impacted by the pollution incident
- Letter Box drops of incident information and site contacts to local residents impacted by the pollution incident

The Stakeholder Relations Manager can assist in the process of communicating with the community, as per the Stakeholder Engagement Plan for the site.

10. INCIDENT RESPONSE TRAINING

Widemere Recycling will implement the Pollution Incident Response Management Plan by training or providing information to relevant employees and contractors in relevant areas of the Plan.

Training or information will be provided on the following;

- The contents and intent of this PIRMP,
- The roles and responsibilities of site staff in relation to this PIRMP
- Spill response procedures;
- General environmental awareness; and / or
- Hazardous materials awareness.

11. PIRMP AUDIT

The objectives of an audit are to maintain compliance with this plan. Internal audits of this Plan will be undertaken every 3 years.

Routine testing of the plan will be conducted annually, and can be completed through the following methods:

- Simulated environmental emergency, or
- Desktop simulations.

12. PIRMP REVIEW

Revisions are to be coordinated by the Site Manager and Environmental Representative.

The objectives of a review are:

- To maintain compliance with the statutory requirements, and
- To identify opportunities for improvement in the Plan, and reduce the risk to human health and the environment

12.1. EVENT BASED

Events which may trigger a review of this Plan or its associated documents include:

- Within 1 month of reporting to the nominated parties in accordance with the plan, after a pollution incident, or
- Modification/Improvement to the system

12.2. TIME BASED

Widemere Recycling will review this management plan routinely every 12 months. The Plan review will include:

- This Document, and
- Legislation, Approval and Licence changes.

APPENDIX 1.

RISK ASSESSMENT on POTENTIAL IMPACTS

Hazard and Likelihood Risk Assessment and Corrective Control Measures								
Site: Widemere Recycling			Responsible Person: Site Manager/Supervisor			Review Date: 13th March 2017		
Name / ref of pollutant/ chemicals	**Description of Hazard / Incident leading to hazard**	**Conseq-uence**	**Likeli-hood**	**Risk**	**Impact on neighbours**[3]	**Control Measures** **Corrective Action** **Coverage under other Plans**	**Responsible person**	**Action date**
Diesel	**Incident #1** Catastrophic failure of diesel storage tank.	4	1	M(4)	Yes	Consequence: (Major): Failure resulting in loss of all or substantial volume of tanks would be captured entirely by existing primary bund with no release to soil or water. Loss of fuel outside the bund would be captured by the rollover bund. Likelihood: (Unlikely): Due to location within bund, damage to tanks is unlikely to occur from external equipment. In addition, tanks are maintained in good structural integrity with low risk of failure through corrosion.	As per PIRMP action plan	When required
	Incident #2 Loss of diesel outside bund during refuelling operations.	1	1	L(1)	No	Consequence: (Incidental): Failure resulting in loss/leakage from fuelling or re-fuelling from hose, nozzle or plant/equipment would be captured by the rollover bund & spill kits. Likelihood: (Rare): Due to location within the bund an incident while re-fuelling and fuelling is likely to occur on some occasions. Hoses and refuelling equipment are maintained with low risk of failure.	As per PIRMP action plan	When required

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[3] If the incident may impact on neighbours then it will need to trigger the early warnings assessment and actions

	Incident #3 Loss of fuel outside bunded area with leaking or open drain valve.	1	1	L(1)	No	Consequence: (Incidental): Failure resulting in loss of all or substantial volume of tanks would be captured entirely by primary bund with minimal release to soil. Primary bund connected to oil water separator. Likelihood: (Rare): Blind sump, drain valve, hoses and refuelling equipment are maintained in good structural integrity with low risk of failure.	As per PIRMP action plan	When required
Oils/Solvents	**Incident #4** Loss of oils, solvents, lubricants etc inside bund during delivery and or use.	1	1	L(1)	No	Consequence: (Incidental): Failure resulting in loss of oils/solvents from packaged goods would be captured entirely by existing primary bund with no release to soil or water. Likelihood: (Rare): Due to location within the bund, spillage during delivery and use is unlikely to occur. In addition hoses and decanting equipment are maintained in good structural integrity with low risk of failure.	As per PIRMP action plan	When required
Aggregate stockpiles	**Incident #5** Excessive airborne dust from crushing plant and stockpiles.	3	2	M(6)	Yes	Consequence: (Moderate): Excessive dust from the yard during high winds can cause some nuisance to surrounding areas. Likelihood: (Unlikely): Stockpiles are maintained to a manageable level on a monthly basis. Use of water sprinklers and water cart onsite during windy periods.	As per PIRMP action plan	When required
Cement silos	**Incident #6** Overfilling or failure of cement silo during cement delivery and/or daily operations.	3	1	L(3)	Yes	Consequence: (Moderate): Silo malfunction on a windy day will result in cement powder crossing the site boundary. Cement is highly alkaline and will have a negative effect natural water courses and vegetation. Likelihood: (Rare): Fail-safe controls on the cement silos are serviced every 6 months.	As per PIRMP action plan	When required
Sediment Dams	**Incident #7** Catastrophic failure of one or more sediment dams /tanks releasing large volumes of water into on-site and off-site water courses (i.e creek).	4	1	M(4)	Yes	Consequence: (Major): Catastrophic failure of one or more sediment dams/tanks are likely to result in off-site impacts to water courses which would predominantly reduce water quality over a short period of time. As such, impact to the environment/human health is not considered to be significant. The downstream sediment dam has an overflow to prevent the dam from overfilling, and an acid treatment system reduces the water's alkalinity. Likelihood: (Rare): Dams are frequently monitored and inspected for water levels and dam integrity. **Note:** For PIRMP purposes overflow events during extreme wet weather will be reported under POEO Licence obligations and not Immediate Reporting.	As per PIRMP action plan	When required

Mobile Plant (Boral)	**Incident #8** Mobile plant, hydraulic hose or fuel tank failure	1	2	L(2)	No	Consequence: (Incidental): Failure from fuel tank or hydraulic hoses would be restricted to a small localised area on site. Likelihood: (Unlikely): Hose or fuel tank failure from mobile plant would be minimal as prestart and regular maintenance programs are in place to capture and prevent such occurrences. Spills kits are maintained and available.	As per PIRMP action plan	When required
Mobile plant (Contractor/ Visitor)	**Incident #9** Mobile plant, hydraulic hose or fuel tank failure	1	2	L(2)	No	Consequence: (Incidental): Failure from fuel tank or hydraulic hoses would be restricted to a small localised area on site. Likelihood: (Unlikely): Hose or fuel tank failure from mobile plant would be minimal as prestart and regular maintenance programs are in place to capture and prevent such occurrences. Spills kits are maintained and available. Inductions for all contractors demonstrating their accountabilities and responsibilities for reporting environmental incidents.	As per PIRMP action plan	When required
Car Park	**Incident #10** Ruptured fuel tank in the carpark.	1	1	L(1)	No	Consequence: (Incidental): Failure from fuel tank or hydraulic hoses would be restricted to a small localised area in the car park. Likelihood: (Rare): Hose or fuel tank failure from employee or visitor car would be minimal. Car park area is fully sealed, and any significant runoff would be directed to the dam. Spill kits are maintained and available in various areas.	As per PIRMP action plan	When required
Traffic areas (dust)	**Incident # 11** Surface dust from traffic areas	2	3	M(6)	Yes	Consequence: (Minor): Dust is created from continuous mobile plant operations across site. Likelihood: (Possible): Main areas watered with water cart in high wind conditions.	As per PIRMP action plan	When required

APPENDIX 2.

PIRMP RESPONSE ACTIONS

Incident No 1

Incident #1	Catastrophic failure of diesel storage tank. Actions Required: • Contact all relevant people/departments (refer to Immediate Reporting Contact Sheet in office or at spill kit station) • Ensure bunds are capturing full volume of diesel • Ensure bund integrity is sound throughout the entire period of incident (i.e. periodic inspections) • Contact service provider (Caltex No. 1800033111 or Transpacific 02 96007185) to pump-out bund contents • Area to be restricted to Incident Response Personnel • Ensure spill kit available for any release from bund • If any release from bund onto unsealed soil/surface water - Environmental Consultants to be engaged to investigate and remediate contamination. • Repair/replace tanks • Refuel tanks Inspect bund for ongoing serviceability
Alarm raising	Any personnel involved or witnessing incident to report to immediate supervisor and PIRMP actions to be implemented.
Emergency Controller	• David Simpson – Operations Manager • Adrian Preece – Site Manager • Call service provider (Ops Manager) • Spill Kit manager (Supervisor) • Periodic inspections and update reporting of site and bund (Ops Manager)
Scale of incident	Incident would be restricted to Diesel storage area with minimal external impact, however, potential for bund overflow or failure may result in soil and surface water contamination that will require specialist investigation/remediation.
Evacuate	• Only if fire or explosion potential exists. Manager and any advice provided by Fire Dept as part of attendance after immediate notification.
Communications	Internal: • David Simpson – Operations Manager • Adrian Preece – Site Manager • Greg Johnson– Enviro Representative

	External mandatory: - Immediate Reporting Contact Sheet to be used External non-mandatory: N/A
Rescuer / respondent + safety checks	As per Site Emergency Plan or Fire Department as part of Immediate Reporting
Rescue + First Aid	As per Site Emergency Plan or Fire Department as part of Immediate Reporting
Clean up and Waste disposal	Service Provider to dispose of diesel and advise on required clean-up.
Reporting and re-preparedness	See SOPs: - GRP-HSEQ-3-02 Incident Reporting Investigation and Action Management - GRP-HSEQ-8-07 Spill Management

Incident No 2

Incident #2	Loss of diesel outside bund during refueling operations Actions Required: - Contact all relevant people/department (refer to Immediate Reporting Contact Sheet in the office or spill kit station) - Ensure bunds are capturing full volume of diesel - Ensure bund integrity is sound throughout the entire period of incident (i.e. periodic inspections) - Contact service provider (Caltex No. 1800033111 or Transpacific 02 96007185) to pump-out bund contents - Area to be restricted to Incident Response Personnel - Ensure spill kit available for any release from bund - If any release from bund onto unsealed soil/surface water - Environmental Consultants to be engaged to investigate and remediate contamination. - Repair/replace tanks - Refuel tanks Inspect bund for ongoing serviceability
Alarm raising	Any personnel involved or witnessing incident to report to immediate supervisor and PIRMP actions to be implemented.
Emergency Controller	- David Simpson – Operations Manager - Adrian Preece – Site Manager - Call service provider (Ops Manager) - Spill Kit manager (Supervisor)

	• Periodic inspections and update reporting of site and bund (Ops Manager)
Scale of incident	Incident would be restricted to Diesel storage area with minimal external impact. However, potential for bund overflow or failure may result in soil and surface water contamination that will require specialist investigation/remediation.
Evacuate	• Only if fire or explosion potential exists. Manager and any advice provided by Fire Dept as part of attendance after immediate notification.
Communications	Internal: • David Simpson – Operations Manager • Adrian Preece – Site Manager • Greg Johnson – Enviro Representative External mandatory: • Immediate Reporting Contact Sheet to be used External non-mandatory: N/A
Rescuer / respondent + safety checks	As per Site Emergency Plan or Fire Department as part of Immediate Reporting
Rescue + First Aid	As per Site Emergency Plan or Fire Department as part of Immediate Reporting
Clean up and Waste disposal	Service Provider to dispose of diesel and advise on required clean-up.
Reporting and re-preparedness	See SOPs: • GRP-HSEQ-3-02 Incident Reporting Investigation and Action Management • GRP-HSEQ-8-07 Spill Management

Incident No 3

Incident #3	Loss of fuel outside bunded area with leaking or open drain valve Actions Required: • Contact all relevant people/department (refer to Immediate Reporting Contact Sheet in the office or spill kit station) • Ensure bunds are capturing full volume of diesel • Ensure bund integrity is sound throughout the entire period of incident (i.e. periodic inspections) • Contact service provider (Caltex No. 1800033111 or Transpacific 02 96007185) to pump-out bund contents • Area to be restricted to Incident Response Personnel • Ensure spill kit available for any release from bund

	• If any release from bund onto unsealed soil/surface water - Environmental Consultants to be engaged to investigate and remediate contamination. • Repair/replace tanks • Repair/replace the drain valve and lock the valve • Refuel tanks Inspect bund for ongoing serviceability
Alarm raising	Any personnel involved or witnessing incident to report to immediate supervisor and PIRMP actions to be implemented.
Emergency Controller	• David Simpson - Ops Manager • Adrian Preece – Site Manager • Call service provider (Ops Manager) • Spill Kit manager (Supervisor) • Periodic inspections and update reporting of site and bund (Ops Manager)
Scale of incident	Incident would be restricted to chemical storage area with minimal external impact. However, potential for bund overflow or failure may result in soil and surface water contamination that will require specialist investigation/remediation.
Evacuate	• Only if fire or explosion potential exists. Manager and any advice provided by Fire Dept as part of attendance after immediate notification.
Communications	Internal: • David Simpson – Operations Manager • Adrian Preece – Site Manager • Greg Johnson – Enviro Representative External mandatory: • Immediate Reporting Contact Sheet to be used External non-mandatory: N/A
Rescuer / respondent + safety checks	As per Site Emergency Plan or Fire Department as part of Immediate Reporting
Rescue + First Aid	As per Site Emergency Plan or Fire Department as part of Immediate Reporting
Clean up and Waste disposal	Service Provider to dispose of diesel and advise on required clean-up.
Reporting and re-preparedness	See SOPs: • GRP-HSEQ-3-02 Incident Reporting Investigation and Action Management • GRP-HSEQ-8-07 Spill Management

Incident No 4

Incident #4	Loss off oil/solvents, lubricants etc inside bund during delivery and/or use Actions Required: • Contact all relevant people/department (refer to Immediate Reporting Contact Sheet in the office or spill kit station) • Ensure bunds are capturing full volume of oil/solvents • Ensure bund integrity is sound throughout the entire period of incident (i.e. periodic inspections) • Contact service provider (Caltex No. 1800033111or Transpacific 02 96007185) to pump-out bund contents • Area to be restricted to Incident Response Personnel • Ensure spill kit available for any release from bund • If any release from bund onto unsealed soil/surface water - Environmental Consultants to be engaged to investigate and remediate contamination. • Inspect bund for ongoing serviceability
Alarm raising	Any personnel involved or witnessing incident to report to immediate supervisor and PIRMP actions to be implemented.
Emergency Controller	• Davy Simpson Operations Manager • Adrian Preece – Site Manager • Call service provider (Ops Manager) • Spill Kit manager (Supervisor) • Periodic inspections and update reporting of site and bund (Operations Manager)
Scale of incident	Incident would be restricted to chemical storage area with minimal external impact. However, potential for bund overflow or failure may result in soil and surface water contamination that will require specialist investigation/remediation.
Evacuate	• Only if fire or explosion potential exists. Manager and any advice provided by Fire Dept as part of attendance after immediate notification.
Communications	Internal: • David Simpson – Operations Manager • Adrian Preece – Site Manager • Greg Johnson– Enviro Representative External mandatory: • Immediate Reporting Contact Sheet to be used External non-mandatory: N/A
Rescuer / respondent + safety checks	As per Site Emergency Plan or Fire Department as part of Immediate Reporting
Rescue + First	As per Site Emergency Plan or Fire Department as part of Immediate Reporting

Aid	
Clean up and Waste disposal	Service Provider to dispose of diesel, oil, grease and advise on required clean-up.
Reporting and re-preparedness	See SOPs: • GRP-HSEQ-3-02 Incident Reporting Investigation and Action Management • GRP-HSEQ-8-07 Spill Management

Incident No 5

Incident #5	Excessive airbourne dust from crushing plant and stockpiles Actions Required: • Employees, Contractor/Visitor to notify site representative of issue immediately. (induction) • Daily monitoring to be undertaken to assess weather and site conditions • Contact all relevant people/department (refer to Immediate Reporting Contact Sheet) • Dust suppression activity to commence immediately on stockpiles
Alarm raising	Any personnel involved or witnessing incident to report to immediate supervisor and PIRMP actions to be implemented.
Emergency Controller	• David Simpson - Operations Manager • Adrian Preece – Site Manager • Call service provider (Ops Manager) • Spill Kit manager (Supervisor) • Periodic inspections and update reporting of site and bund (Operations Manager)
Scale of incident	Incident would be localised to the area surrounding stockpile area, with minimal external impact.
Evacuate	• Only if fire or explosion potential exists. Manager and any advice provided by Fire Dept as part of attendance after immediate notification.
Communications	Internal: • David Simpson – Operations Manager • Adrian Preece – Site Manager • Greg Johnson – Enviro Representative

	External mandatory: • Immediate Reporting Contact Sheet to be used External non-mandatory: N/A
Rescuer / respondent + safety checks	As per Site Emergency Plan or Fire Department as part of Immediate Reporting
Rescue + First Aid	As per Site Emergency Plan or Fire Department as part of Immediate Reporting
Clean up and Waste disposal	Service Provider to dispose of diesel and advise on required clean-up.
Reporting and re-preparedness	See SOPs: • GRP-HSEQ-3-02 Incident Reporting Investigation and Action Management • GRP-HSEQ-8-07 Spill Management

Incident No 6

Incident #6	Overfilling or failure of cement silo during cement delivery and/or daily operations. Actions Required: • If event is during cement delivery, immediately cease activity • Employees, Contractor/Visitor to notify site representative of issue immediately. (induction) • Contact all relevant people/department (refer to Immediate Reporting Contact Sheet)
Alarm raising	Any personnel involved or witnessing incident to report to immediate supervisor and PIRMP actions to be implemented.
Emergency Controller	• David Simpson - Operations Manager • Adrian Preece – Site Manager • Call service provider (Ops Manager) • Spill Kit manager (Supervisor) • Periodic inspections and update reporting of site and bund (Operations Manager)
Scale of incident	A Minor spillage while filling the silo would be localised to the area surrounding Stabilization Plant, with minimal external impact. Catastrophic failure of silo could result in cement dust being blown across site boundary depending on wind force and direction.

Evacuate	• Only if fire or explosion potential exists. Manager and any advice provided by Fire Dept as part of attendance after immediate notification.
Communications	Internal: • David Simpson – Operations Manager • Adrian Preece – Site Manager • Greg Johnson – Enviro Representative External mandatory: • Immediate Reporting Contact Sheet to be used External non-mandatory: N/A
Rescuer / respondent + safety checks	As per Site Emergency Plan or Fire Department as part of Immediate Reporting
Rescue + First Aid	As per Site Emergency Plan or Fire Department as part of Immediate Reporting
Clean up and Waste disposal	Site Management to decide appropriate clean up method and disposal.
Reporting and re-preparedness	See SOPs: • GRP-HSEQ-3-02 Incident Reporting Investigation and Action Management • GRP-HSEQ-8-07 Spill Management

Incident No 7

Incident #7	Catastrophic failure of one or more sediment dams/tanks releasing large volumes of water into on-site and off-site water courses Actions Required: • Contact all relevant people/department (refer to Immediate Reporting Contact Sheet in the office or spill kit station) • Ensure bund integrity is sound throughout the entire period of incident (i.e. periodic inspections) • Contact local neighbours if going to be in inundated by rise of water • Area to be restricted to Incident Response Personnel • If any release from site onto unsealed soil/surface water - Environmental Consultants to be engaged to investigate and remediate contamination if any • Contact local contractor to rebuild dams immediately
Alarm raising	Any personnel involved or witnessing incident to report to immediate supervisor and PIRMP actions to be implemented.
Emergency	• David Simpson- Operations Manager

Controller	• Adrian Preece – Site Manager • Call service provider (Ops Manager) • Spill Kit manager (Supervisor) • Periodic inspections and update reporting of site and bund (Ops Manager)
Scale of incident	Catastrophic failure of one or more sediment dams are likely to result in off-site impacts to water courses which would predominantly reduce water quality over a short period of time. As such, impact to the environment/human health is not considered to be significant.
Evacuate	• Only if flood potential exists. Business Manager and any advice provided by Fire Dept as part of attendance after immediate notification.
Communications	Internal: • David Simpson – Operations Manager • Adrian Preece – Site Manager • Greg Johnson – Enviro Representative External mandatory: • Immediate Reporting Contact Sheet to be used External non-mandatory: N/A
Rescuer / respondent + safety checks	As per Site Emergency Plan or Fire Department as part of Immediate Reporting
Rescue + First Aid	As per Site Emergency Plan or Fire Department as part of Immediate Reporting
Clean up and Waste disposal	Consultants to be contacted to advise on required clean-up.
Reporting and re-preparedness	See SOPs: • GRP-HSEQ-3-02 Incident Reporting Investigation and Action Management • GRP-HSEQ-8-07 Spill Management

Incident No 8

Incident #8	Mobile plant, hydraulic hose or fuel tank failure. Actions Required: • Contact all relevant people/department (refer to Immediate Reporting Contact Sheet in the office or spill kit station)

	• Area to be restricted to Incident Response Personnel • Ensure spill kit available for any release from mobile plant & equipment • If any release from mobile plant onto unsealed soil/surface water is investigated and remediated immediately • Call service provider to inspect plant & equipment for serviceability
Alarm raising	Any personnel involved or witnessing incident to report to immediate supervisor and PIRMP actions to be implemented.
Emergency Controller	• David Simpson - Operations Manager • Adrian Preece – Site Manager • Call service provider (Ops Manager) • Spill Kit manager (Supervisor) • Periodic inspections and update reporting of site and bund (Ops Manager)
Scale of incident	Incident would be localised to the area with no external impact.
Evacuate	• Only if fire or explosion potential exists. Site Manager and any advice provided by Fire Dept as part of attendance after immediate notification.
Communications	Internal: • David Simpson – Operations Manager • Adrian Preece – Site Manager • Greg Johnson – Enviro Representative External mandatory: • Immediate Reporting Contact Sheet to be used External non-mandatory: N/A
Rescuer / respondent + safety checks	As per Site Emergency Plan or Fire Department as part of Immediate Reporting
Rescue + First Aid	As per Site Emergency Plan or Fire Department as part of Immediate Reporting
Clean up and Waste disposal	Service Provider to dispose of diesel and advise on required clean-up.
Reporting and re-preparedness	See SOPs: • GRP-HSEQ-3-02 Incident Reporting Investigation and Action Management • GRP-HSEQ-8-07 Spill Management

Incident No 9

Incident $^{\#}$9	Mobile plant, hydraulic hose or fuel tank failure from contractors / visitors. Actions Required: • Contractor/Visitor to notify site representative of issue immediately. (induction) • Contact all relevant people/department (refer to Immediate Reporting Contact Sheet) • Area to be restricted to Incident Response Personnel • Ensure spill kit available for any release from mobile plant & equipment • If any release from mobile plant onto unsealed soil/surface water is investigated and remediated immediately • Call service provider to inspect plant & equipment for serviceability
Alarm raising	Any personnel involved or witnessing incident to report to immediate supervisor and PIRMP actions to be implemented.
Emergency Controller	• David Simpson- Operations Manager • Adrian Preece – Site Manager • Call service provider (Ops Manager) • Spill Kit manager (Supervisor) • Periodic inspections and update reporting of site and bund (Ops Manager)
Scale of incident	Incident would be localised to the area with no external impact.
Evacuate	• Only if fire or explosion potential exists. Manager and any advice provided by Fire Dept as part of attendance after immediate notification.
Communications	Internal: • David Simpson – Operations Manager • Adrian Preece – Site Manager • Greg Johnson – Enviro Representative External mandatory: • Immediate Reporting Contact Sheet to be used External non-mandatory: N/A
Rescuer / respondent + safety checks	As per Site Emergency Plan or Fire Department as part of Immediate Reporting
Rescue + First	As per Site Emergency Plan or Fire Department as part of Immediate Reporting

Aid	
Clean up and Waste disposal	Service Provider to dispose of contaminates.
Reporting and re-preparedness	See SOPs: • GRP-HSEQ-3-02 Incident Reporting Investigation and Action Management • GRP-HSEQ-8-07 Spill Management

Incident No 10

Incident #10	Ruptured fuel tank in the carpark. Actions Required: • Contractor/Visitor to notify site representative of issue immediately. (induction) • Area to be restricted to Incident Response Personnel • Ensure spill kit available for any release from mobile plant • If any release from mobile plant onto unsealed soil/surface water is investigated and remediated immediately
Alarm raising	Any personnel involved or witnessing incident to report to immediate supervisor and PIRMP actions to be implemented.
Emergency Controller	• David Simpson- Operations Manager • Adrian Preece – Site Manager • Call service provider (Ops Manager) • Spill Kit manager (Supervisor) • Periodic inspections and update reporting of site and bund (Ops Manager)
Scale of incident	Incident would be localised to the area with no external impact.
Evacuate	Only if fire or explosion potential exists. Manager and any advice provided by Fire Dept as part of attendance after immediate notification.
Communications	Internal: • David Simpson – Operations Manager • Adrian Preece – Site Manager • Greg Johnson – Enviro Representative External mandatory: • Immediate Reporting Contact Sheet to be used External non-mandatory: N/A

Rescuer / respondent + safety checks	As per Site Emergency Plan or Fire Department as part of Immediate Reporting
Rescue + First Aid	As per Site Emergency Plan or Fire Department as part of Immediate Reporting
Clean up and Waste disposal	Service Provider to dispose of contaminate
Reporting and re-preparedness	See SOPs: • GRP-HSEQ-3-02 Incident Reporting Investigation and Action Management • GRP-HSEQ-8-07 Spill Management

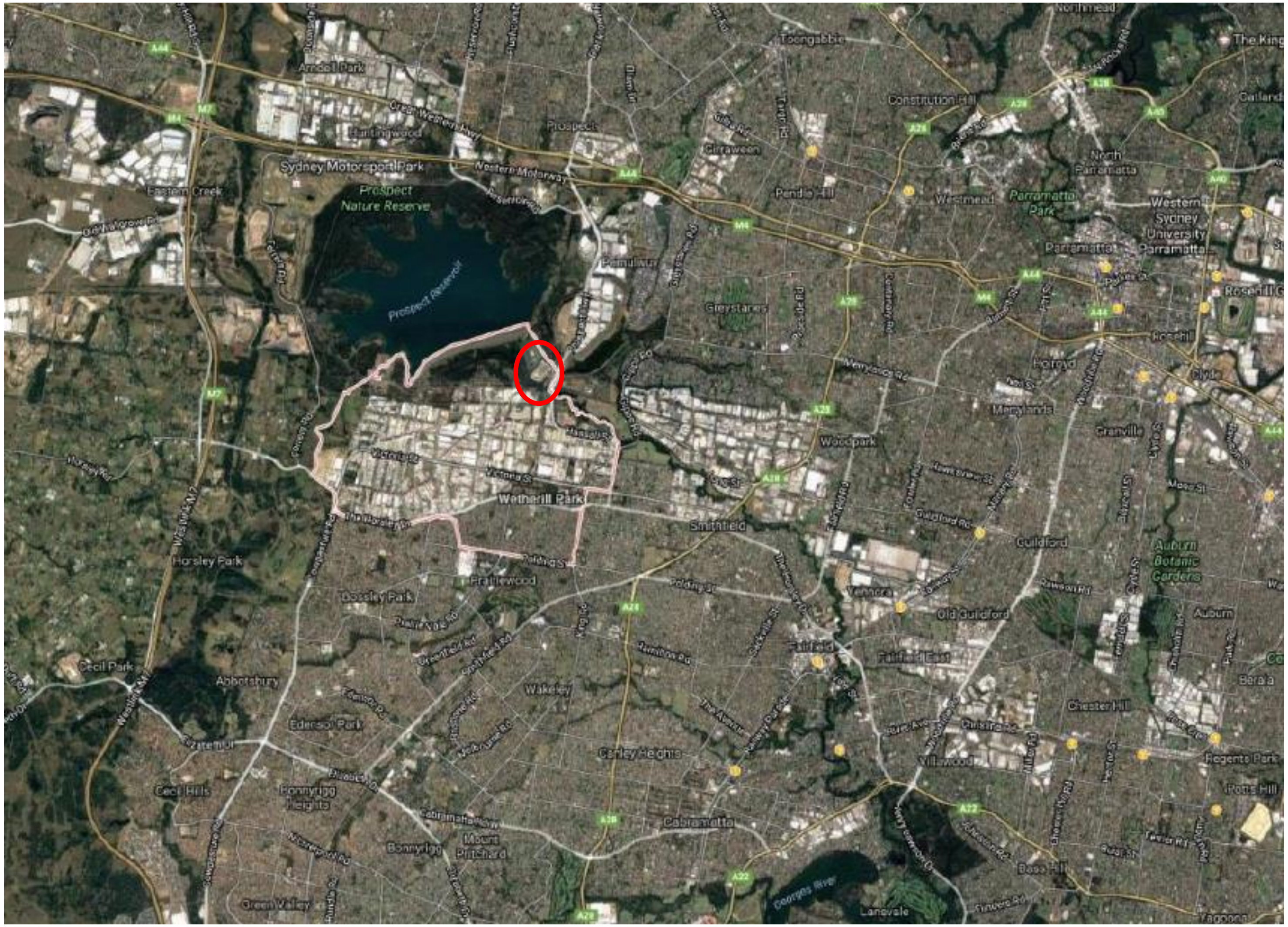
Incident No 11

Incident #11	Dust from traffic areas. Actions Required: • Employees, Contractor/Visitor to notify site representative of issue immediately. (induction) • Daily monitoring to be undertaken to capture whether and site conditions • Contact all relevant people/department (refer to Immediate Reporting Contact Sheet) • Dust suppression activity to commence immediately on unsealed roads & dusty areas of site
Alarm raising	Any personnel involved or witnessing incident to report to immediate supervisor and PIRMP actions to be implemented.
Emergency Controller	• David Simpson - Operations Manager • Adrian Preece – Site Manager • Business Manager to instruct site personnel (Ops Manager)
Scale of incident	Incident would be localised to the area with minimal external impact.
Evacuate	Only if fire or potential exists. Manager and any advice provided by Fire Dept as part of attendance after immediate notification.
Communications	Internal: • David Simpson – Operations Manager • Adrian Preece – Site Manager • Greg Johnson – Enviro Representative

	External mandatory: - Immediate Reporting Contact Sheet to be used if required External non-mandatory: N/A
Rescuer / respondent + safety checks	As per Site Emergency Plan or Fire Department as part of Immediate Reporting
Rescue + First Aid	As per Site Emergency Plan or Fire Department as part of Immediate Reporting
Clean up and Waste disposal	N/A
Reporting and re-preparedness	See SOPs: - GRP-HSEQ-3-02 Incident Reporting Investigation and Action Management - GRP-HSEQ-8-07 Spill Management

APPENDIX 3.

WIDEMERE RECYCLING LOCATION MAP



APPENDIX 4.

WIDEMERE RECYCLING REFERENCE MAP

APPENDIX 5.

WIDEMERE RECYCLING – MAP OF AFFECTED AREAS

APPENDIX 6.

POLLUTION INCIDENT NOTIFICATION LOG

Person undertaking notification (Name/Function):		
Date and time when first become aware of the incident:		
Incident type:		
Comments:		

Initial immediate notification log				
Appropriate Regulatory Authority	**Time of call**	**Respondent's name/function**	**Approximate call duration**	**Comments**
EPA				
Public Health Unit				
Fire and Rescue NSW				
Local Council				
WorkCover				
Other:				
Other:				
Summary of initial communication:				

Person undertaking notification (Name/Function):		
Date and time when additional information become available:		
Comments:		

Immediate notification of further pertinent information (if applicable)				
Appropriate Regulatory Authority	**Time of call**	**Respondent's name/function**	**Approximate call duration**	**Comments**
EPA				
Public Health Unit				
Fire and Rescue NSW				
Local Council				
WorkCover				
Other:				
Other:				
Summary of additional communication				

Appendix K

One Point Lesson – Reporting Environmental Incidents

WROPL R-9

Reporting Incidents to the DoPE & EPA

Boral Widemere Recycling shall report any incidents with actual or potential significant off-site impacts on people or the biophysical environment as soon as practicable after the occurrence of the incident.

1. Report incidents of actual or potential to site supervisor and / or site manager immediately. Reportable incidents may include; excessive water discharged off site, deposited dust exceedances, large hydrocarbon spills.
2. Site manager to report incident to Environment Manager immediately.
3. Site Manager / Environment Manager to notify DoPE & EPA as soon as practicable.
4. Written report to be provided to the DoPE & EPA with seven (7) days of the incident occurring.

Date Created: 11/01/2017	**Completed by :** Philip Paterson	**Approved by:** Adrian Preece
Training Required: Yes -Toolbox talk	**SOP Updated:** Yes	**Documents to be Updated:**

Appendix L

One Point Lesson – Stockpile Heights

One Point Lesson

Stockpile Heights

- As per Development Consent (SSD-6521) & EPL 11815 – Stockpile height limit is 20m
- Stockpile heights can be measured in relation to the telecom pole located adjacent to the receivals stockpile (which is just below 20m).

Date Created: 02/02/17	**Completed by:** Philip Paterson	**Approved by:** Adrian Preece
Training Required: Yes/No	**OPL Updated:**	**Documents to be Updated:** When required

Appendix M

Groundwater investigations

Ground Floor, Suite 01, 20 Chandos Street
St Leonards, NSW, 2065
PO Box 21
St Leonards, NSW, 1590

T +61 2 9493 9500
F +61 2 9493 9599
E info@emmconsulting.com.au

www.emmconsulting.com.au

29 February 2017

Philip Paterson
Site Supervisor - Recycling
Boral Recycling

Philip.Paterson@boral.com.au

Re: Boral Widemere Recycling Facility - Groundwater monitoring bores drilling completion report

1 Introduction

1.1 Background

Boral Recycling Pty Limited (Boral) have commissioned EMM Consulting Pty Limited (EMM) to install and design a groundwater monitoring network at their Boral Widemere Recycling Facility, located in Wetherill Park, New South Wales (NSW), on Lot 4001 DP 1173524.

The facility separates, crushes and blends construction and demolition waste with quarry material to produce a range of recycled aggregate and road base products. Development consent (DA 25-11-2016-i) was granted on 26 November 2016 under the Environmental Planning and Assessment Act 1979 (EP&A Act) expanding the capacity of the existing operations. The facility is now approved to process 1,000,000 tonnes per annum of material.

A groundwater monitoring network was installed in January 2017 to comply with Condition 38 of the development consent, which requires a groundwater monitoring program to be conducted within six months of the commencement of the expanded operations. Condition 38 also requires assessment of the potential for leakage from the sediment basins present in the southern part of the site (Figure 1).

1.2 Scope of work

The scope of works included:

- drilling and construction of a groundwater monitoring network;
- installation of pressure transducers (dataloggers) at groundwater monitoring bores;
- hydraulic conductivity testing at groundwater monitoring bores;
- water quality testing of groundwater and sediment basins; and
- a report outlining the construction details for the monitoring bores and results of the testing to inform a preliminary indication of the potential for leakage from the sediment basins and the potential influence of groundwater on the basins.

Source: EMM (2017); LPMA (2014)

KEY

⊖ Monitoring bore

☐ Cadastral boundary

— Watercourse

T:\Jobs\2017\J17004 - Widemere drilling\GIS\02 Maps\W001 GWMonitoring 20170215 03.mxd 15/02/2017

Groundwater
monitoring network

Boral Widemere
Groundwater Monitoring
Figure 1

2 Drilling program

Between 16 and 19 January 2017, four groundwater monitoring bores were drilled and constructed in the project area (Figure 1 and Table 1). The geological bore logs for each monitoring bore are presented in Appendix A.

The drilling of all monitoring bores was undertaken by Terratest Pty Ltd, using a reverse circulation rig under the supervision of an EMM hydrogeologist. The target depth of the boreholes and the construction details were confirmed on site by the supervising EMM hydrogeologist following assessment of encountered geology and depth to groundwater.

Table 1 Monitoring bore construction details

Bore ID	Total depth (m bgl)[1]	Screened interval (m bgl)	Screened lithology	Purpose
MW01	25.5	17.5 – 23.5	Ashfield Shale	Regional groundwater level monitoring
MW02	11.0	3.0 – 9.0	Clay	Sediment basin seepage monitoring
MW03	11.0	3.0 – 9.0	Clay	Sediment basin seepage monitoring
MW04	29.0	20.0 – 26.0	Ashfield Shale	Regional groundwater level monitoring

Notes: 1.m bgl = metres below ground level.

Solinst M30 dataloggers were installed in all four bores set to record a water level every six hours. A barometric logger was installed at MW01 to record local changes in barometric pressure that will be used to calibrate the level data.

2.1 Survey details

The groundwater monitoring bores locations were surveyed by registered surveyors (Mepstead & Associates) to Map Grid of Australia (MGA), a UTM grid coordinate system based on the Geocentric Datum of Australia 1994. The monitoring bores were all surveyed for surfaced elevation to metres above Australian Height Datum (m AHD). The results of the survey are detailed in Table 2.

Table 2 Monitoring bore survey details

Bore ID	Easting[1]	Northing[1]	Ground level (m AHD)[2]	Top of casing (m AHD)[2]
MW01	305828.8	6254316	40.45	40.98
MW02	306054.4	6254252	39.16	39.78
MW03	306088.9	6254274	39.54	40.19
MW04	306010.5	6254560	47.33	47.86

Notes: 1.Grid system: MAG56.

2.m AHD = metres above Australian Height Datum.

3 Hydraulic conductivity testing

3.1 Methodology

In-situ horizontal hydraulic conductivity testing was completed in the form of rising head or falling head (‘slug’) tests. These tests are simple field procedures designed to calculate the approximate hydraulic conductivity of aquifer formations adjacent to the groundwater monitoring bore screens. The slug test results are presented as the indicative hydraulic conductivity (as m/day) for the formations tested, this information can be used to quantify the ease with which groundwater moves horizontally through rock and can inform estimates of groundwater inflow.

The rising head tests were completed by lowering a purpose built ‘slug’ (a 33 mm diameter, 0.5 m long solid PVC conjugate tube) into the saturated section of the groundwater monitoring bore. The slug is instantaneously removed from the bore, causing the water level to rise as water is drawn into the bore from the aquifer. The opposite, a falling head test is achieved where by the slug is instantaneously added to the well, causing the water level to fall as water enters the formation. The time taken for the displaced water to dissipate either into or out of the well is used to calculate the hydraulic conductivity. A slug test schematic is shown in Figure 2**.**

At the commencement of the test, the groundwater standing water level (SWL) was measured from a fixed reference point at the top of casing and a datalogger was installed in the bore to continuously measure the groundwater level changes (programmed to 1 second to 1 minute intervals). During the test both manual and electronic SWL measurements were recorded.

Test results were analysed in using the Bouwer and Rice (Bouwer 1976), and Hvorslev (1951) method, as the monitoring wells partially penetrate the aquifer. Both the Hvorslev, and Bouwer and Rice methods are suitable for confined and semi-confined aquifers showing an over damped response (ie water level recovery to initial static level is smooth and approximately exponential) (Fetter 2001).

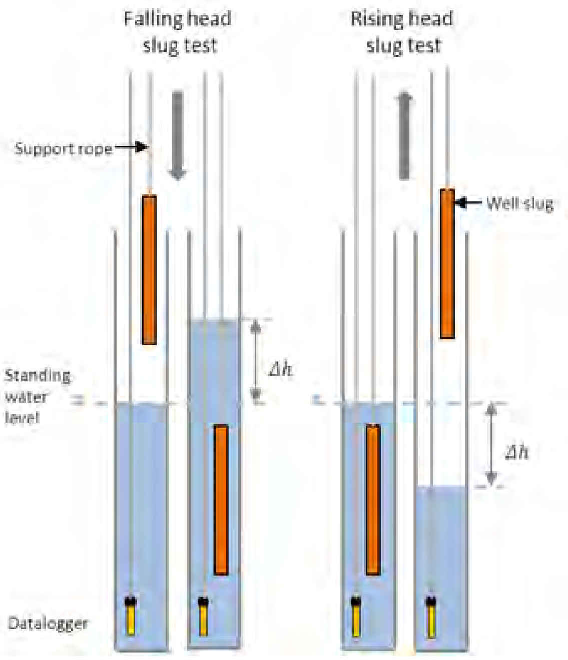


Figure 2 Slug test schematic (after Waterra In-Situ 2011)

3.2 Results

The range and average hydraulic conductivity values for the monitoring bores are presented in Table 3.

Table 3 Hydraulic conductivity estimates

Bore ID	Lithology	Standing water level (m btoc)[1]	Hydraulic conductivity range (m/day)[2]	Average hydraulic conductivity (m/day)[2]
MW01	Shale	9.67	$4.5 \times 10^{-4} – 4.9 \times 10^{-4}$	4.7×10^{-4}
MW02	Clay	7.96	$1.2 \times 10^{-3} – 2.2 \times 10^{-3}$	1.7×10^{-3}
MW03	Clay	6.71	5.1×10^{-4}	5.1×10^{-4}
MW04	Shale	16.23	1.2×10^{-3}	1.2×10^{-3}

Notes: 1. m btoc = metres below top of casing.

2. m/day = metres per day.

3 Water quality

3.3 Sampling methodology

Water quality sampling was completed between 19 and 20 January 2017 following the installation of the monitoring bores.

To obtain a water quality sample, the following methods were used:

- a 12 V submersible pump was used to purge all monitoring bores. Water quality parameters were measured during and following purging to monitor water quality changes and to indicate groundwater representative of the formation suitable for sampling and analysis. In summary:
    - MW01 and MW03: purged dry after one bore volume was removed; a grab sample of the recharge water was collected using a disposable bailer; and
    - MW02 and MW04: three bore volumes were removed prior to sampling.
- a telescopic sampler was used to collect water quality samples from the sediment basins.

It should be noted that the water samples were collected during a wet weather event, where direct rainfall was contributing to the water in the basins and surface runoff was contributing to Basin 1.

Water quality samples were analysed for a broad chemical suite designed to specifically assess the chemical characteristics of the different hydrogeological units. Water quality samples were collected in the sample bottles specified by the laboratory, with appropriate preservation where required. Samples undergoing dissolved metal analysis were filtered through 0.45 µm filters in the field prior to collection. The samples were analysed by ALS Environmental (Smithfield) a NATA accredited laboratory.

3.4 Results

Complete water quality results are presented in Appendix B and laboratory reports are presented in Appendix C.

Water quality results are compared against the ANZECC/ARMCANZ (2000) guidelines for freshwater ecosystems (south-east Australia – NSW lowland rivers) because rivers are believed to be the ultimate receiving waters for groundwater discharge. However, these water guidelines are often naturally exceeded in many catchments, and should not be considered as water quality objectives or thresholds.

Key findings for this monitoring event are:

- pH conditions in groundwater ranged from near neutral in the deeper Ashfield Shale monitoring bores (pH 6.92 at MW04 and pH 7.36 at MW01) to alkaline in the shallow clay seepage monitoring bores (pH 7.93 at MW02 and pH 8.3 at MW03).pH conditions in the sediment basins were alkaline (pH 10.68 at Basin 1 and pH 8.33 at Basin 2); the ANZECC/ARMCANZ (2000) guideline (NSW lowland river ecosystems) was exceeded at MW03 and at the basins;

- salinity ranged from fresh in the clay monitoring bores (624 µS/cm at MW02 and 827 µS/cm at MW03) and the basins (566 µS/cm at the Basin 2 and 1,126 µS/cm at Basin 1) to slightly saline in the Ashfield Shale monitoring bores (3536 µS/cm at MW04 and 7,170 µS/cm at MW01) and exceeded the ANZECC/ARMCANZ (2000) guideline (NSW lowland river ecosystems) in the shale;

- the major ion characteristics of water samples are shown in a piper diagram in Figure 3. Groundwater in the clay monitoring bores (MW02 and MW03) is dominated by sodium and bicarbonate (Na-HCO_3 type); groundwater in the Ashfield Shale monitoring bores (MW01 and MW04) is dominated by sodium and chloride (Na-Cl type); and water in the sediment basins is dominated by sodium with moderate bicarbonate;

- dissolved metal concentrations were generally present in groundwater and in the sediment basins at concentrations below the ANZECC/ARMCANZ (2000) guidelines, with the exception of detections of aluminium and copper in the basins and copper at MW03, which exceeded the guidelines;

- nutrient concentrations generally exceeded the ANZECC/ARMCANZ (2000) guidelines for total nitrogen and total phosphorus concentrations, with concentrations generally the highest in the clay monitoring bores;

- concentrations of polynuclear aromatic hydrocarbons (PAH), total recoverable hydrocarbons (TRH), total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene, total xylenes and naphthalene (BTEXN) were below the laboratory limit of reporting (LOR).

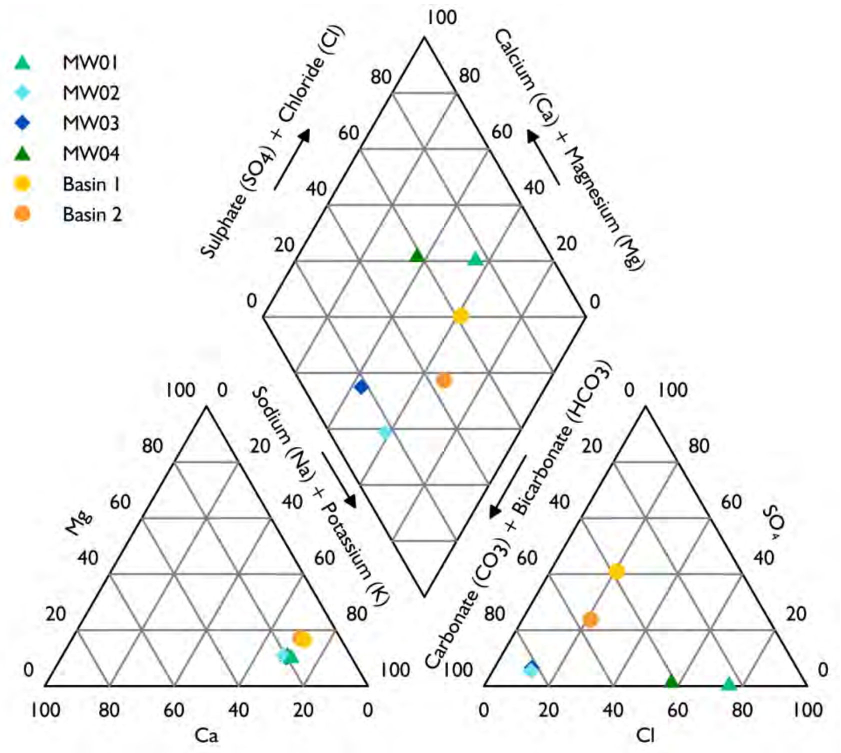


Figure 3 Piper diagram displaying major ion chemistry

4 Conclusions

Two regional groundwater monitoring bores were installed to monitor groundwater encountered in the Ashfield shale underlying the facility. Two shallow seepage monitoring bores were also installed in the shallow clay substrate to monitor potential seepage from the two sediment basins on site and to assess the potential influence of local groundwater on the basins. Groundwater was encountered in all four bores and groundwater level dataloggers were installed.

Hydraulic testing indicates relatively low hydraulic conductivity across all monitoring bores.

Initial water quality results indicate differences between water quality in the clay (seepage) monitoring bores (MW02 and MW03) and in the Ashfield Shale regional groundwater monitoring bores (MW01 and MW04).

A less clear distinction is observed between the seepage monitoring bores and the sediment basins (Appendix B). In summary:

- concentrations of arsenic, barium, copper, molybdenum, nickel and ammonia are detected at comparable levels; while
- concentrations of aluminium, chromium, vanadium, nitrite and nitrate are detected in the basins and not in groundwater; and
- concentrations of manganese and total phosphorus are detected at higher concentrations in groundwater compared to the basins.

Based on the available data, no clear conclusion can be made at this stage on the potential for seepage from the sediment basins and the influence of groundwater on the basins.

5 Recommendations

It is recommended that further monitoring is undertaken to better characterise the groundwater system and to further assess the potential for seepage from the sediment basins and the influence of groundwater on the basins. The following is recommended:

- installation of dataloggers in the basins to allow for correlation of water levels between the seepage monitoring bores and the basins (completed in February 2017); and
- complete a further round of water quality sampling at the groundwater monitoring bores, at the existing monitoring bore installed on the site boundary (MW24) and at Basin 2 during a dry weather period (completed in February 2017).

The development conditions requires a groundwater monitoring program (GMP) to be conducted within six months of the commencement of the expanded operations. The GMP will collect baseline groundwater levels and groundwater quality data; assess the potential for leakage of the sediment basins; and identify if further groundwater monitoring is required.

Yours sincerely

Carolina Sardella
Senior Hydrogeologist
csardella@emmconsulting.com.au

Appendix A – Geological and construction bore logs
Appendix B – Water quality summary tables
Appendix C – Laboratory report

Appendix A

Geological bore logs

www.emmconsulting.com.au
Suite 01, 20 Chandos Street
St Leonards NSW 2065
T: 02 9493 9500
F: 02 9493 9599

WATER MONITORING BORE LOG

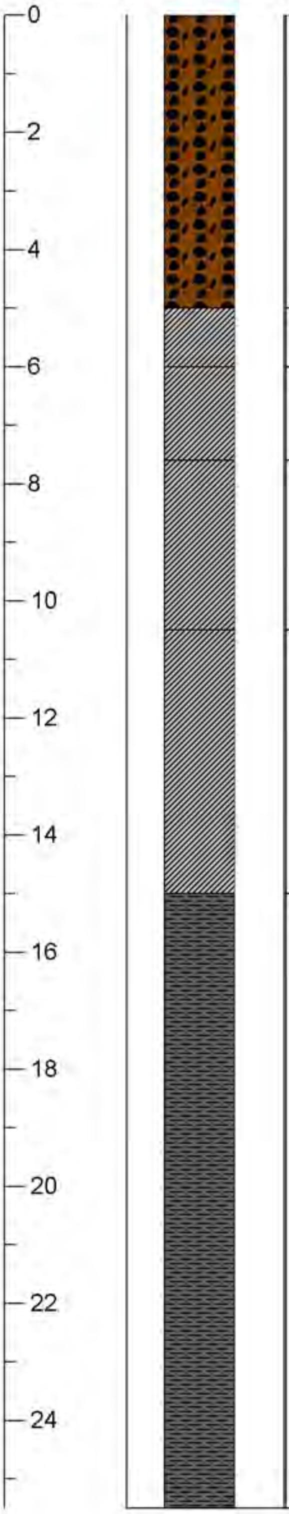
Bore ID: MW01

Client: Boral Recycling Pty Limited
Project: Boral Widemere Recycling Facility

Date completed: 17/01/2017
Drilling contractor: Terratest Pty Ltd
Drilling method: Reverse circulation
Hydrogeologist: Kele Maher
Static Water Level: 9.890 (m below top of casing)

Project number: J17004
Elevation: N/A
Easting: N/A
Northing: N/A
Date: 18/01/2017

Depth (mbgl) | **Lithology Graphic** | **Description** | **Bore Completion Diagram**: **Diagram** | **Design notes**



FILL: Dark brown, basalt and soil

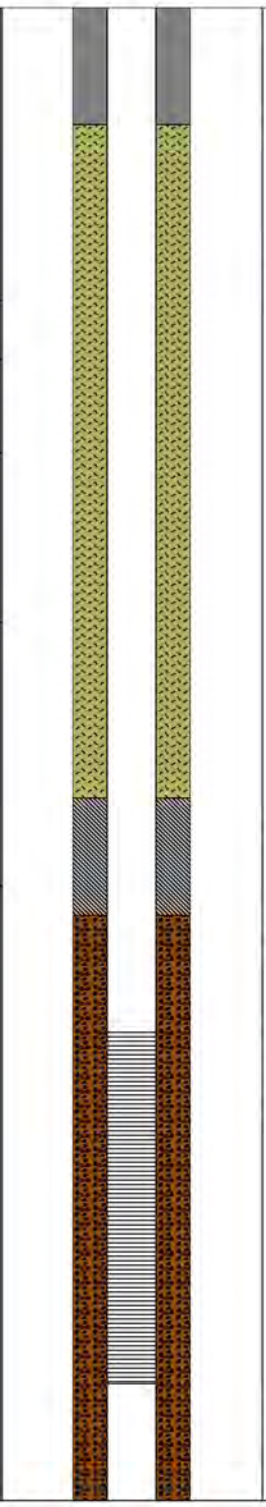
CLAY: Dark grey, and shale (20%)

CLAY: Green and grey, and dark grey soft clay

CLAY: Light brown, soft with green mottles

CLAY: Yellow, dry

SHALE: Dark grey, dark grey siltstone (10%), yellow to brown clay (5%)



Cement grout

Backfill

50mm blank PN18 U-PVC casing (threaded)

Bentonite seal

Gravel pack (2-5 mm washed)

50mm slotted PN18 U-PVC casing (0.5mm aperture)

50mm blank PN18 U-PVC sump (threaded)

EMM
www.emmconsulting.com.au
Suite 01, 20 Chandos Street
St Leonards NSW 2065
T: 02 9493 9500
F: 02 9493 9599

WATER MONITORING BORE LOG

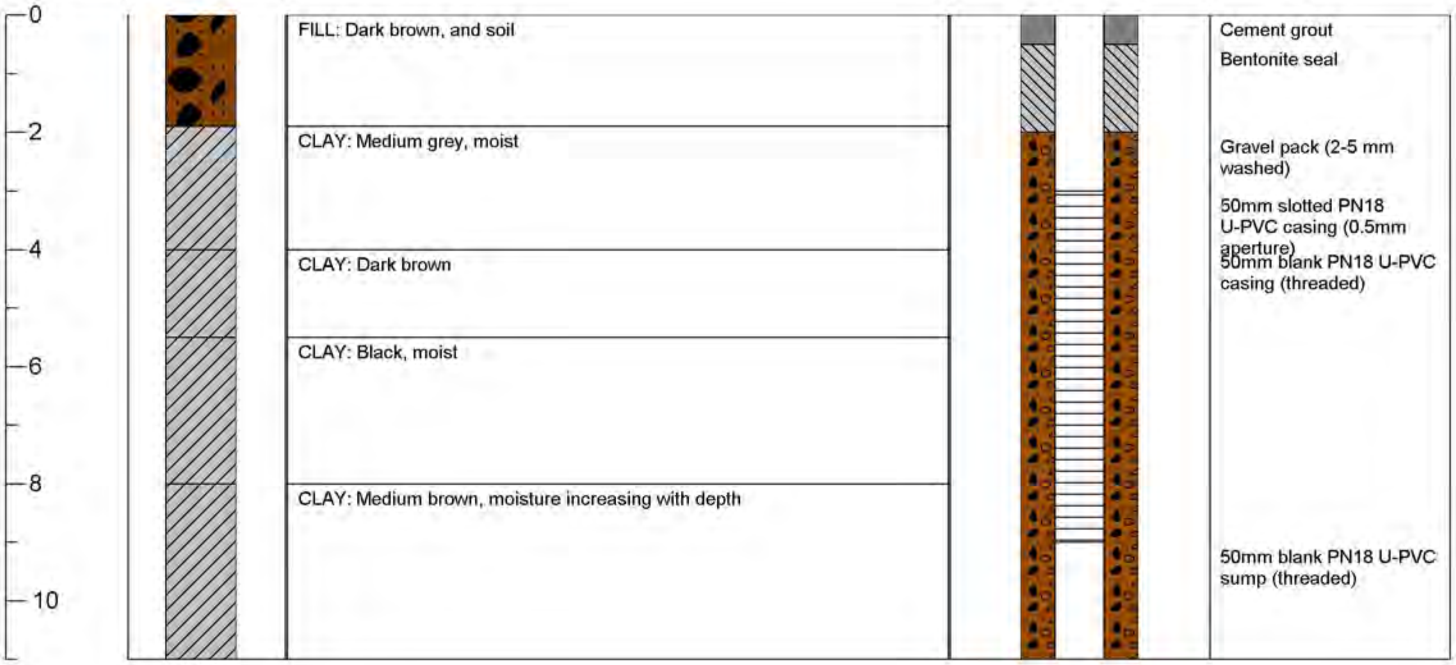
Bore ID: MW02

Client: Boral Recycling Pty Limited
Project: Boral Widemere Recycling Facility

Date completed: 17/01/2017
Drilling contractor: Terratest Pty Ltd
Drilling method: Reverse circulation
Hydrogeologist: Kele Maher
Static Water Level: 7.96 (m below top of casing)

Project number: J17004
Elevation: N/A
Easting: N/A
Northing: N/A
Date: 19/01/2017

Depth (mbgl)	Lithology Graphic	Description	Bore Completion Diagram	
			Diagram	Design notes



FILL: Dark brown, and soil

CLAY: Medium grey, moist

CLAY: Dark brown

CLAY: Black, moist

CLAY: Medium brown, moisture increasing with depth

Cement grout

Bentonite seal

Gravel pack (2-5 mm washed)

50mm slotted PN18 U-PVC casing (0.5mm aperture)

50mm blank PN18 U-PVC casing (threaded)

50mm blank PN18 U-PVC sump (threaded)

EMM
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Suite 01, 20 Chandos Street
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T: 02 9493 9500
F: 02 9493 9599

WATER MONITORING BORE LOG

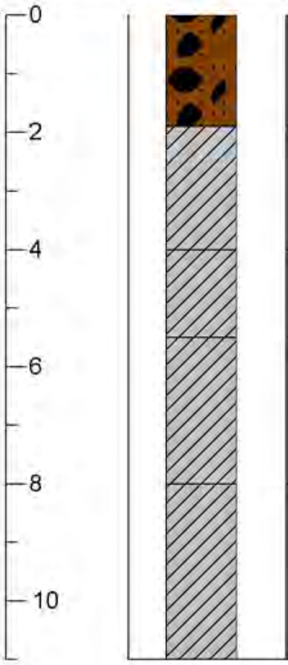
Bore ID: MW03

Client: Boral Recycling Pty Limited
Project: Boral Widemere Recycling Facility

Date completed: 18/01/2017
Drilling contractor: Terratest Pty Ltd
Drilling method: Reverse circulation
Hydrogeologist: Kele Maher
Static Water Level: 6.750 (m below top of casing)

Project number: J17004
Elevation: N/A
Easting: N/A
Northing: N/A
Date: 20/01/2017

Depth (mbgl) | **Lithology Graphic** | **Description** | **Bore Completion Diagram**: **Diagram** | **Design notes**



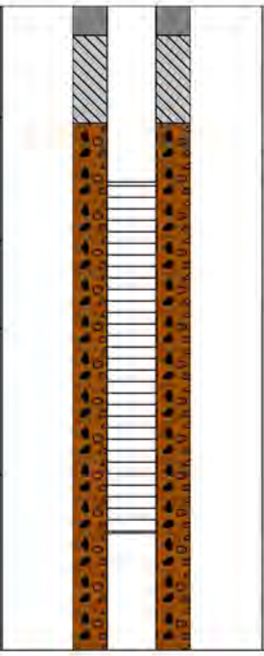
FILL: Dark grey, and soil

CLAY: Brown, wet

CLAY: Brown, some basalt

CLAY: Black, moist

CLAY: Medium to dark brown, some black clay



Cement grout

Bentonite seal

Gravel pack (2-5 mm washed)

50mm slotted PN18 U-PVC casing (0.5mm aperture)

50mm blank PN18 U-PVC casing (threaded)

50mm blank PN18 U-PVC sump (threaded)

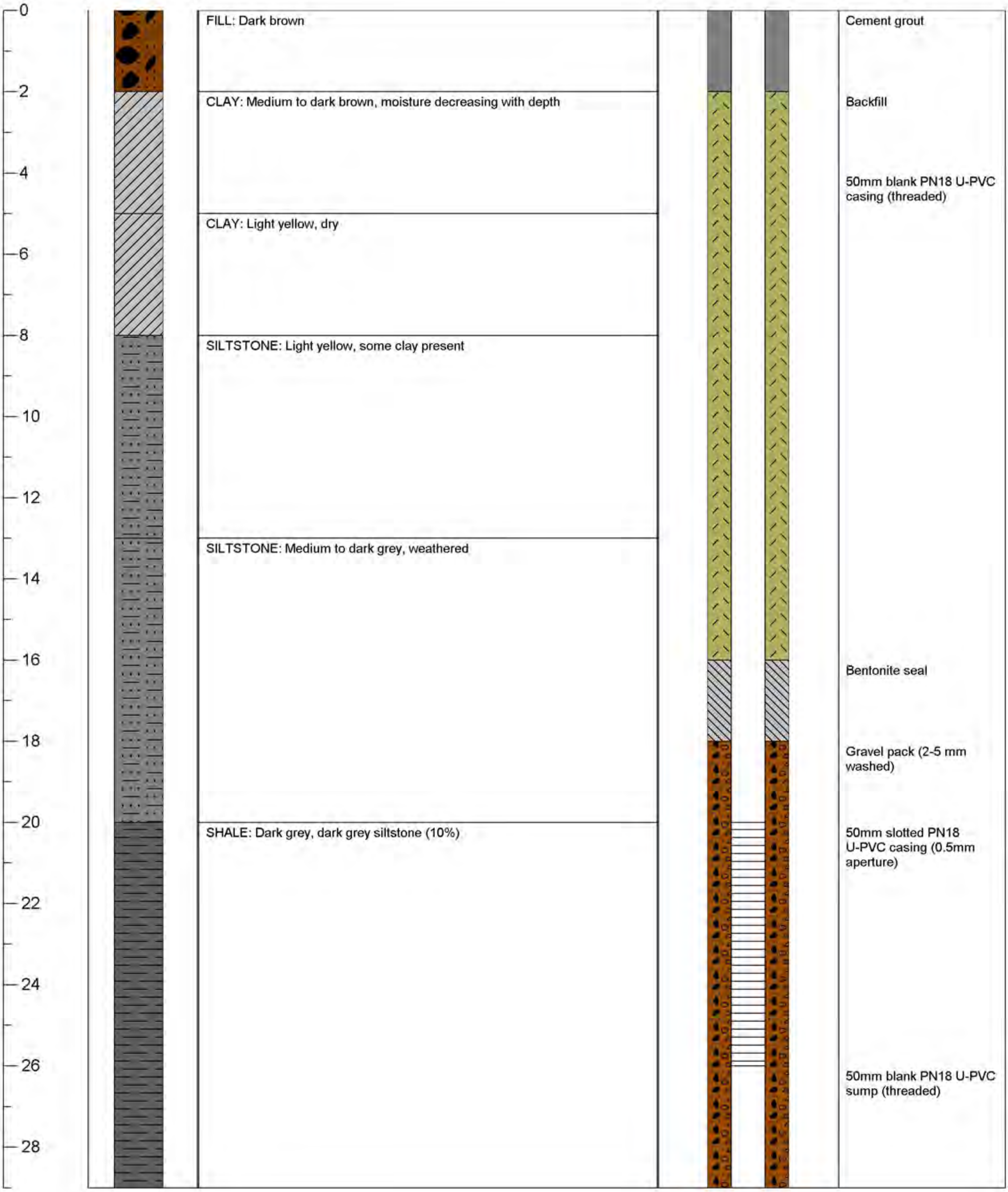
EMM
www.emmconsulting.com.au
Suite 01, 20 Chandos Street
St Leonards NSW 2065
T: 02 9493 9500
F: 02 9493 9599

WATER MONITORING BORE LOG

Bore ID: MW04

Client: Boral Recycling Pty Limited
Project: Boral Widemere Recycling Facility
Date completed: 19/01/2017
Drilling contractor: Terratest Pty Ltd
Drilling method: Reverse circulation
Hydrogeologist: Sean Moran
Static Water Level: 16.23 (m below top of casing)
Project number: J17004
Elevation: N/A
Easting: N/A
Northing: N/A
Date: 19/01/2017

Depth (mbgl)	**Lithology Graphic**	**Description**	**Bore Completion Diagram** **Diagram**	**Design notes**



FILL: Dark brown

CLAY: Medium to dark brown, moisture decreasing with depth

CLAY: Light yellow, dry

SILTSTONE: Light yellow, some clay present

SILTSTONE: Medium to dark grey, weathered

SHALE: Dark grey, dark grey siltstone (10%)

Cement grout

Backfill

50mm blank PN18 U-PVC casing (threaded)

Bentonite seal

Gravel pack (2-5 mm washed)

50mm slotted PN18 U-PVC casing (0.5mm aperture)

50mm blank PN18 U-PVC sump (threaded)

Appendix B

Water quality summary table

Appendix B - Water quality results January 2017

				Site ID	Site ID	MW01[2]	MW02[1]	MW03[1]	MW04[2]	Basin 1[1]	Basin 2[1]
				Sample date	Sample date	20/01/2017	19/01/2017	20/01/2017	19/01/2017	20/01/2017	20/01/2017
Chemical Group	**Chemical Name**	**Units**	**LOR**	ANZECC 2000 FW 95% (moderate hardness)[1]	ANZECC 2000 FW 95% (extreme hardness)[2]						
Field	pH (field)	pH units		6.5-8	6.5-8	7.36	7.93	8.3	6.92	10.68	8.33
	Electrical conductivity (field)	uS/cm		125-2200	125-2200	7,020	624	827	3,536	1,126	566
	Electrical conductivity (lab)	µS/cm	1	125-2200	125-2200	7,170	602	715	4,260	1,030	491
	Temp (Field)	°C				22.8	19	20.6	20.4	25.7	25.2
	Dissolved Oxygen (%)	%		85-110	85-110	31.1	34.1	50	17.2	59.2	57.9
	DO (Field)	mg/L				2.65	3.14	4.51	1.51	4.81	4.76
	Redox	mV				-82.8	-96.1	84.8	-105.5	-78.7	-79.3
	Total dissolved solids (lab)	mg/L	10			4,550	667	875	2,950	570	346
	Suspended solids	mg/L	5			205	2,270	14,800	466	315	64
Laboratory analytes	Alkalinity (Hydroxide) as CaCO3	mg/L	1			<1	<1	<1	<1	66	<1
	Carbonate Alkalinity-mg CaCO3/L	mg/L	1			<1	15	20	<1	65	<1
	Bicarbonate Alkalinity-mg CaCO3/L	mg/L	1			385	213	242	485	<1	82
	Alkalinity (total) as CaCO3	mg/L	1			385	228	263	485	130	82
	Sulfate as SO4 - Turbidimetric	mg/L	1			36	29	40	45	156	67
	Chloride	mg/L	1			1,740	46	52	954	58	44
	Calcium	mg/L	1			177	18	27	200	63	25
	Magnesium	mg/L	1			260	21	35	207	<1	3
	Sodium	mg/L	1			857	85	73	354	82	56
	Potassium	mg/L	1			8	<1	1	10	57	26
	Fluoride	mg/L	0.01			0.641	0.577	0.514	0.264	<0.01	0.587
Dissolved metals	Aluminium	mg/L	0.01	0.055	0.055	0.03	<0.01	0.01	0.05	2.61	0.12
	Arsenic	mg/L	0.001			0.003	0.001	<0.001	0.014	0.002	0.003
	Barium	mg/L	0.001			0.916	0.028	0.031	1.29	0.017	0.014
	Beryllium	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Cadmium	mg/L	0.0001	**0.0005**	**0.002**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Chromium	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	0.036	0.004
	Copper	mg/L	0.001	**0.0035**	**0.0126**	0.003	0.001	0.005	0.003	0.024	0.006
	Lead	mg/L	0.001	**0.014**	**0.091**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Manganese	mg/L	0.001	1.9	1.9	0.847	0.1	0.417	0.247	<0.001	<0.001
	Mercury	mg/L	0.0001	0.0006	0.0006	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Molybdenum	mg/L	0.001			0.016	0.02	0.015	0.006	0.022	0.01
	Nickel	mg/L	0.001	**0.028**	**0.099**	0.007	0.003	0.006	0.011	0.004	0.001
	Vanadium	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	0.04	0.02
	Zinc	mg/L	0.005	**0.02**	**0.072**	0.011	<0.005	<0.005	0.015	<0.005	<0.005
Nutrients	Ammonia (as N)	mg/L	0.01	0.9	0.9	0.24	0.4	0.36	0.28	0.25	0.13
	Nitrite (as N)	mg/L	0.01			<0.01	<0.01	<0.01	<0.01	1.5	0.04
	Nitrate (as N)	mg/L	0.01			<0.01	<0.01	<0.01	0.02	1.19	0.53
	Nitrate + Nitrite (as N)	mg/L	0.01			<0.01	<0.01	<0.01	0.02	2.69	0.57
	Nitrogen (Total)	mg/L	0.1	0.35	0.35	0.3	0.8	2.3	0.5	4.3	1.3
	Kjeldahl Nitrogen Total	µg/L	100			300	800	2,300	500	1,600	700
	Total phosphorus	mg/L	0.01	0.025	0.025	0.05	3.28	2.4	0.2	0.1	0.02
	Reactive phosphorus (as P)	mg/L	0.01			<0.01	0.04	<0.01	<0.01	<0.01	<0.01
Polycyclic aromatic hydrocarbons	Acenaphthene	µg/L	1			<1	<1	<1	<1	<1	<1
	Acenaphthylene	µg/L	1			<1	<1	<1	<1	<1	<1
	Fluorene	µg/L	1			<1	<1	<1	<1	<1	<1
	Phenanthrene	µg/L	1			<1	<1	<1	<1	<1	<1
	Anthracene	µg/L	1			<1	<1	<1	<1	<1	<1
	Fluoranthene	µg/L	1			<1	<1	<1	<1	<1	<1
	Pyrene	µg/L	1			<1	<1	<1	<1	<1	<1
	Benz(a)anthracene	µg/L	1			<1	<1	<1	<1	<1	<1
	Chrysene	µg/L	1			<1	<1	<1	<1	<1	<1
	Benzo(k)fluoranthene	µg/L	1			<1	<1	<1	<1	<1	<1
	Benzo(b&j)fluoranthene	µg/L	1			<1	<1	<1	<1	<1	<1
	Benzo(a) pyrene	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(a)pyrene TEQ calc (Zero)	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Indeno(1,2,3-c,d)pyrene	µg/L	1			<1	<1	<1	<1	<1	<1
	Dibenz(a,h)anthracene	µg/L	1			<1	<1	<1	<1	<1	<1
	Benzo(g,h,i)perylene	µg/L	1			<1	<1	<1	<1	<1	<1
	PAHs (Sum of total)	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total petroleum hydrocarbons	C 6 - C 9 Fraction	µg/L	20			<20	<20	<20	<20	<20	<20
	C10 - C14 Fraction	µg/L	50			<50	<50	<50	<50	<50	<50
	C15 - C28 Fraction	µg/L	100			<100	<100	<100	<100	<100	<100
	C29 - C36 Fraction	µg/L	50			<50	<50	<50	<50	<50	<50
	TPH+C10 - C36 (Sum of total)	µg/L	50			<50	<50	<50	<50	<50	<50
Total recoverable hydrocarbons	C6-C10 fraction	µg/L	20			<20	<20	<20	<20	<20	<20
	C6 - C10 fraction minus BTEX	µg/L	20			<20	<20	<20	<20	<20	<20
	C10 - C16 fraction	µg/L	100			<100	<100	<100	<100	<100	<100
	TRH >C10-C16 less Naphthalene (F2)	µg/L	100			<100	<100	<100	<100	<100	<100
	C16 - C34 fraction	µg/L	100			<100	<100	<100	<100	<100	<100
	C34 - C40 fraction	µg/L	100			<100	<100	<100	<100	<100	<100
	C10 - C40 fraction (Sum)	µg/L	100			<100	<100	<100	<100	<100	<100
Aromatic hydrocarbons	Benzene	µg/L	1	950	950	<1	<1	<1	<1	<1	<1
	Toluene	µg/L	2			<2	<2	<2	<2	<2	<2
	Ethylbenzene	µg/L	2			<2	<2	<2	<2	<2	<2
	Xylene (m & p)	µg/L	2			<2	<2	<2	<2	<2	<2
	Xylene (o)	µg/L	2	350	350	<2	<2	<2	<2	<2	<2
	Xylene Total	µg/L	2			<2	<2	<2	<2	<2	<2
	Total BTEX	µg/L	1			<1	<1	<1	<1	<1	<1
	Naphthalene	µg/L	1	16	16	<1	<1	<1	<1	<1	<1
Ionic balance	Anions Total	meq/L	0.01			57.5	6.46	7.55	37.5	7.48	4.27
	Cations Total	meq/L	0.01			67.7	6.32	7.43	42.7	8.17	4.6
	Ionic Balance	%	0.01			8.14	1.04	0.84	6.4	4.39	3.62

Bold values have been corrected for moderate water hardness as follows based on ANZECC/ARMCANZ (2000) Table 3.4.4:

1. Moderate hardness (60 - 119 mg/L as CaCO3): MW02, MW03, Basin 1 and Basin 2; and
2. Extreme hardness (>240 mg/L as CaCO3): MW01 and MW04.

Appendix C

Laboratory report

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order : **ES1701445**
Amendment : **2**
Client : **EMM CONSULTING PTY LTD**
Contact : MS CAROLINA SARDELLA
Address : Ground Floor Suite 1 20 Chandos Street
St Leonards NSW 2065
Telephone : +61 02 9493 9500
Project : J17004
Order number : ----
C-O-C number : ----
Sampler : Sean Moran
Site : ----
Quote number : SYBQ/202/15
No. of samples received : 6
No. of samples analysed : 6

Page : 1 of 11
Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 20-Jan-2017 18:40
Date Analysis Commenced : 21-Jan-2017
Issue Date : 20-Mar-2017 12:49

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Raymond Commodore	Instrument Chemist	Sydney Inorganics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- TDS by method EA-015 may bias high for various samples due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- Amendment (20/03/2017): This report has been amended as a result of a request to change sample identification numbers (IDs) received by ALS from Carolina on 20/3/17. All analysis results are as per the previous report.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 1 (Inflow)**
			Client sampling date / time	20-Jan-2017 10:00	19-Jan-2017 16:00	20-Jan-2017 10:30	19-Jan-2017 16:30	20-Jan-2017 12:45
Compound	*CAS Number*	*LOR*	*Unit*	**ES1701445-001**	**ES1701445-002**	**ES1701445-003**	**ES1701445-004**	**ES1701445-005**
				Result	Result	Result	Result	Result
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**7170**	**602**	**715**	**4260**	**1030**
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	**4550**	**667**	**875**	**2950**	**570**
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**205**	**2270**	**14800**	**466**	**315**
ED009: Anions								
Fluoride	16984-48-8	0.01	mg/L	**0.641**	**0.577**	**0.514**	**0.264**	<0.010
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	**66**
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	**15**	**20**	<1	**65**
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**385**	**213**	**242**	**485**	<1
Total Alkalinity as CaCO3	----	1	mg/L	**385**	**228**	**263**	**485**	**130**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**36**	**29**	**40**	**45**	**156**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**1740**	**46**	**52**	**954**	**58**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**177**	**18**	**27**	**200**	**63**
Magnesium	7439-95-4	1	mg/L	**260**	**21**	**35**	**207**	<1
Sodium	7440-23-5	1	mg/L	**857**	**85**	**73**	**354**	**82**
Potassium	7440-09-7	1	mg/L	**8**	<1	**1**	**10**	**57**
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.03**	<0.01	**0.01**	**0.05**	**2.61**
Arsenic	7440-38-2	0.001	mg/L	**0.003**	**0.001**	<0.001	**0.014**	**0.002**
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	7440-39-3	0.001	mg/L	**0.916**	**0.028**	**0.031**	**1.29**	**0.017**
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	**0.036**
Copper	7440-50-8	0.001	mg/L	**0.003**	**0.001**	**0.005**	**0.003**	**0.024**
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	**0.847**	**0.100**	**0.417**	**0.247**	<0.001
Molybdenum	7439-98-7	0.001	mg/L	**0.016**	**0.020**	**0.015**	**0.006**	**0.022**
Nickel	7440-02-0	0.001	mg/L	**0.007**	**0.003**	**0.006**	**0.011**	**0.004**
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	**0.04**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 1 (Inflow)**
			Client sampling date / time	20-Jan-2017 10:00	19-Jan-2017 16:00	20-Jan-2017 10:30	19-Jan-2017 16:30	20-Jan-2017 12:45
Compound	*CAS Number*	*LOR*	*Unit*	**ES1701445-001**	**ES1701445-002**	**ES1701445-003**	**ES1701445-004**	**ES1701445-005**
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Zinc	7440-66-6	0.005	mg/L	**0.011**	<0.005	<0.005	**0.015**	<0.005
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.24**	**0.40**	**0.36**	**0.28**	**0.25**
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	**1.50**
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	**0.02**	**1.19**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	**0.02**	**2.69**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**0.3**	**0.8**	**2.3**	**0.5**	**1.6**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**0.3**	**0.8**	**2.3**	**0.5**	**4.3**
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.05**	**3.28**	**2.40**	**0.20**	**0.10**
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	**0.04**	<0.01	<0.01	<0.01
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	**57.5**	**6.46**	**7.55**	**37.5**	**7.48**
Total Cations	----	0.01	meq/L	**67.7**	**6.32**	**7.43**	**42.7**	**8.17**
Ionic Balance	----	0.01	%	**8.14**	**1.04**	**0.84**	**6.40**	**4.39**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 1 (Inflow)**
			Client sampling date / time	20-Jan-2017 10:00	19-Jan-2017 16:00	20-Jan-2017 10:30	19-Jan-2017 16:30	20-Jan-2017 12:45
Compound	*CAS Number*	*LOR*	*Unit*	**ES1701445-001**	**ES1701445-002**	**ES1701445-003**	**ES1701445-004**	**ES1701445-005**
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Chrysene	218-01-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	<100	<100	<100	<100
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	<100	<100	<100	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ **Total Xylenes**	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ **Sum of BTEX**	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5

Analytical Results

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

			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 1 (Inflow)**
			Client sampling date / time	20-Jan-2017 10:00	19-Jan-2017 16:00	20-Jan-2017 10:30	19-Jan-2017 16:30	20-Jan-2017 12:45
Compound	CAS Number	LOR	Unit	**ES1701445-001**	**ES1701445-002**	**ES1701445-003**	**ES1701445-004**	**ES1701445-005**
				Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	**15.6**	**23.7**	**21.9**	**25.0**	**18.4**
2-Chlorophenol-D4	93951-73-6	1	%	**39.5**	**52.8**	**48.9**	**58.7**	**44.1**
2.4.6-Tribromophenol	118-79-6	1	%	**40.4**	**62.6**	**61.2**	**72.3**	**34.1**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	**48.3**	**73.4**	**69.0**	**75.6**	**87.7**
Anthracene-d10	1719-06-8	1	%	**56.6**	**79.8**	**55.4**	**61.9**	**67.3**
4-Terphenyl-d14	1718-51-0	1	%	**54.3**	**73.6**	**71.3**	**79.8**	**64.6**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**119**	**118**	**118**	**119**	**117**
Toluene-D8	2037-26-5	2	%	**118**	**117**	**120**	**116**	**121**
4-Bromofluorobenzene	460-00-4	2	%	**109**	**110**	**109**	**108**	**109**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Basin 2**	**----**	**----**	**----**	**----**
			Client sampling date / time	20-Jan-2017 13:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1701445-006**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**491**	----	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	**346**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**64**	----	----	----	----
ED009: Anions								
Fluoride	16984-48-8	0.01	mg/L	**0.587**	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**82**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**82**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**67**	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**44**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**25**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	**3**	----	----	----	----
Sodium	7440-23-5	1	mg/L	**56**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**26**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.12**	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L	**0.003**	----	----	----	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	----	----	----	----
Barium	7440-39-3	0.001	mg/L	**0.014**	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	**0.004**	----	----	----	----
Copper	7440-50-8	0.001	mg/L	**0.006**	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Manganese	7439-96-5	0.001	mg/L	<0.001	----	----	----	----
Molybdenum	7439-98-7	0.001	mg/L	**0.010**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	**0.001**	----	----	----	----
Vanadium	7440-62-2	0.01	mg/L	**0.02**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Basin 2**	----	----	----	----
			Client sampling date / time	20-Jan-2017 13:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1701445-006**	--------	--------	--------	--------
				Result	----	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.13**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	**0.04**	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.53**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.57**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**0.7**	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**1.3**	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.02**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	----	----	----	----
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	**4.27**	----	----	----	----
Total Cations	----	0.01	meq/L	**4.60**	----	----	----	----
Ionic Balance	----	0.01	%	**3.62**	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**Basin 2**	----	----	----	----
			Client sampling date / time	20-Jan-2017 13:00	----	----	----	----
Compound	CAS Number	LOR	Unit	**ES1701445-006**	--------	--------	--------	--------
				Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Chrysene	218-01-9	1	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ **Total Xylenes**	1330-20-7	2	µg/L	<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**Basin 2**	----	----	----	----
			Client sampling date / time	20-Jan-2017 13:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1701445-006**	--------	--------	--------	--------
				Result	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	**23.6**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%	**51.5**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%	**58.1**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	**77.6**	----	----	----	----
Anthracene-d10	1719-06-8	1	%	**85.1**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1	%	**79.3**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**117**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**121**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**108**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	*CAS Number*	*Recovery Limits (%)* Low	*Recovery Limits (%)* High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

31 March 2017

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Boral Recycling

Philip.Paterson@boral.com.au

Re: Boral Widemere Recycling Facility – February 2017 water monitoring results

1 Introduction

1.1 Background

Boral Recycling Pty Limited (Boral) have commissioned EMM Consulting Pty Limited (EMM) to install and design a groundwater monitoring network at their Boral Widemere Recycling Facility, located in Wetherill Park, New South Wales (NSW), on Lot 4001 DP 1173524.

A groundwater monitoring network was installed in January 2017 to comply with Condition 38 of the development consent, which requires a groundwater monitoring program to be conducted within six months of the commencement of the expanded operations. Condition 38 also requires assessment of the potential for leakage from the sediment basins located in the southern part of the site (Figure 1).

1.2 Scope of work

The scope of works included:

- water quality testing of groundwater and Sediment Basin 2; and
- download of the dataloggers installed in the groundwater monitoring bores and in the sediment basins.

2 Groundwater levels

Pressure transducers (dataloggers) were installed in all monitoring bores in January 2017 and programmed to record groundwater levels every six hours (referred to as ‘continuous data’). A barometric datalogger installed above the water table at monitoring bore MW04 records changes in atmospheric pressure. Data from this logger is used to correct for the effects of changing barometric pressure on water levels as recorded in the monitoring bores.

Hydrographs showing groundwater levels and rainfall (recorded at the Prospect Reservoir Bureau of Meteorology weather station (67019)) from the start of monitoring until 17 February 2017 are presented in Figure 2 and Figure 3.

The monitoring period was relatively dry with only one rainfall event of significance, 61 mm on 8 February 2017.

Groundwater levels in the clay monitoring bores (MW02 and MW03) show a response to the 8 February 2017 rainfall event, with monitoring bore MW03 showing a greater response.

Groundwater levels in Ashfield Shale monitoring bores (MW01 and MW04) are comparable and show a muted response to the 8 February 2017 rainfall event.

Source: EMM (2017); LPMA (2014)

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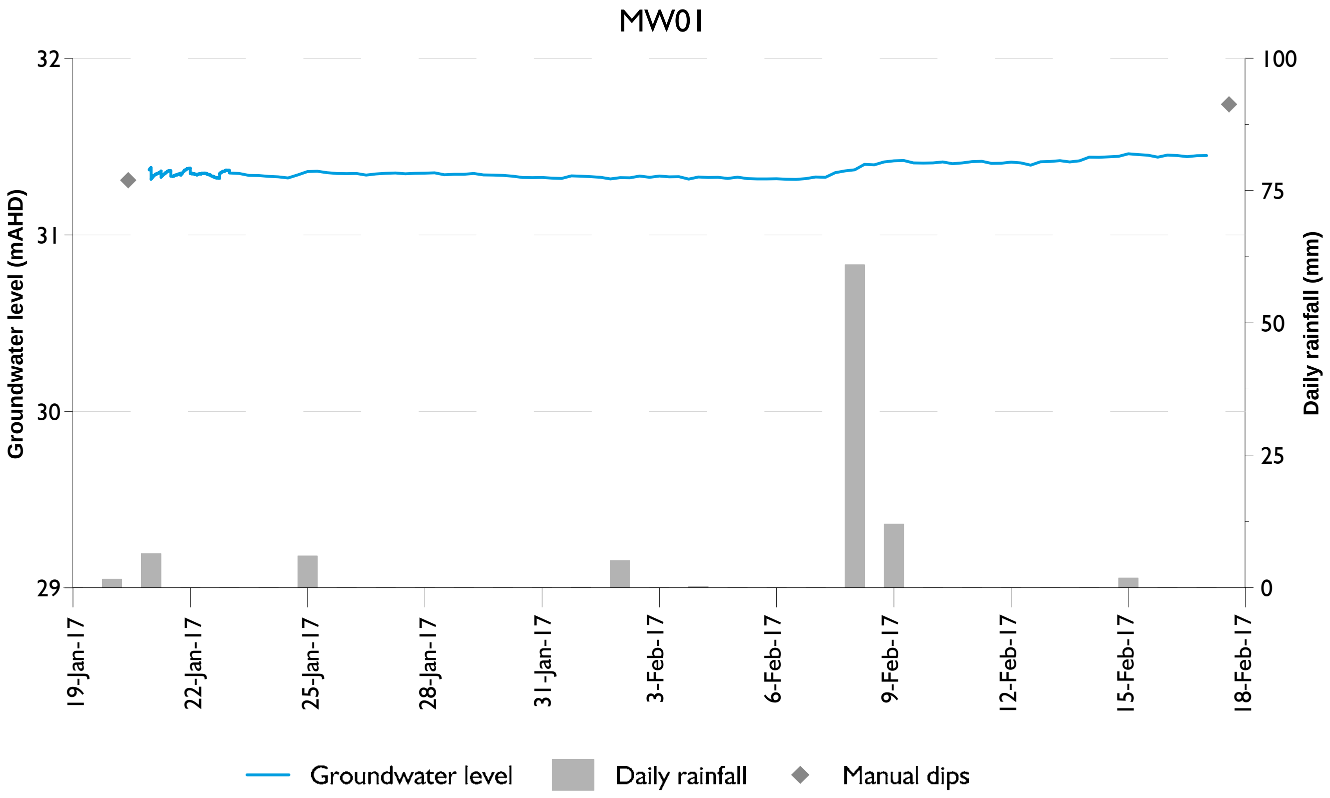
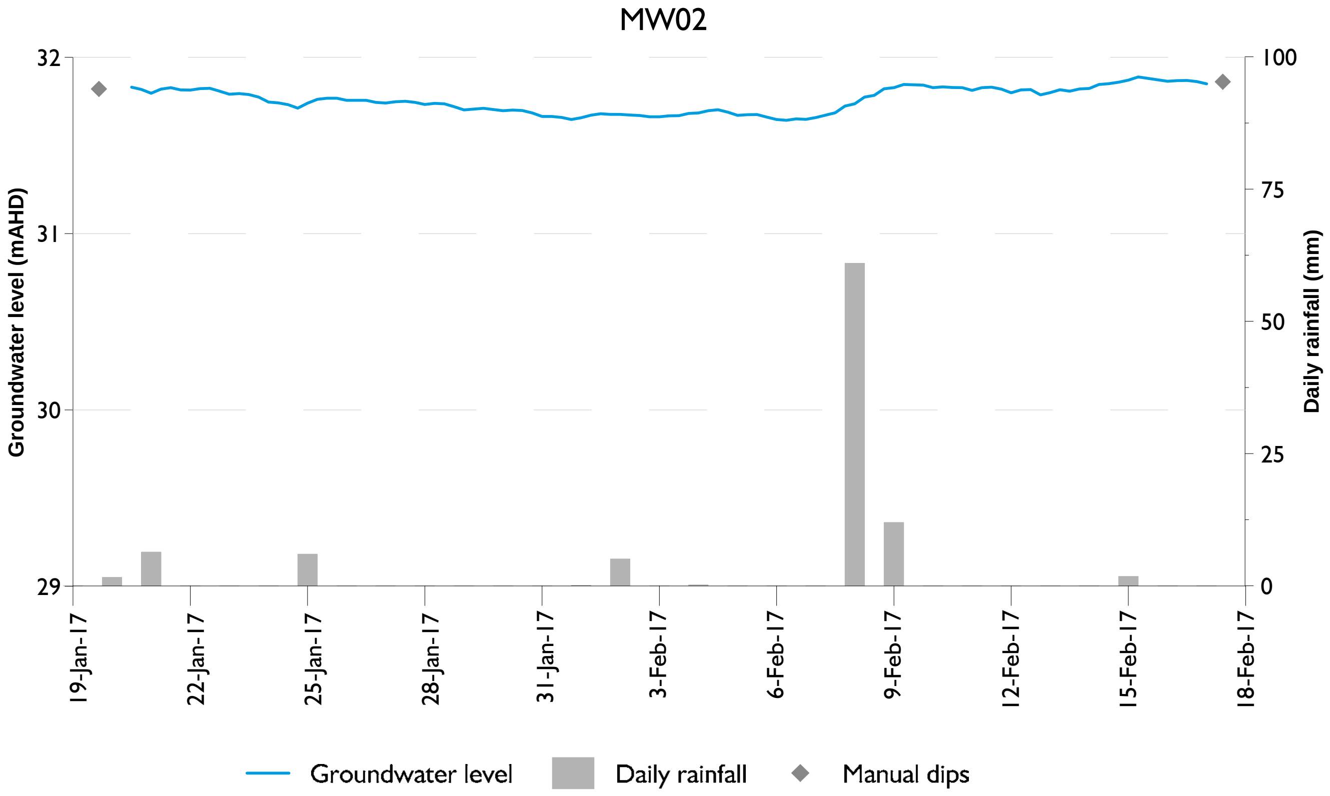
Groundwater monitoring network

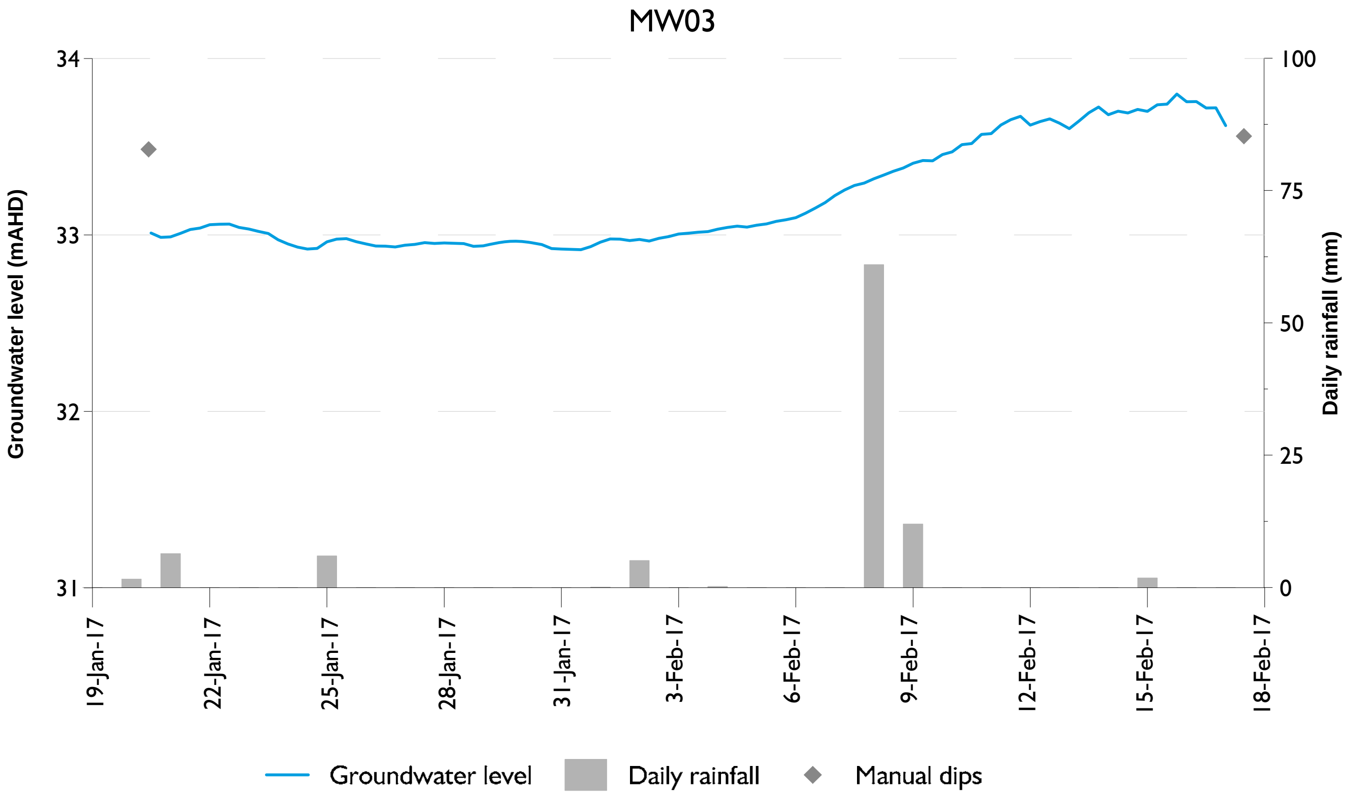
Boral Widemere
Groundwater Monitoring
Figure 1

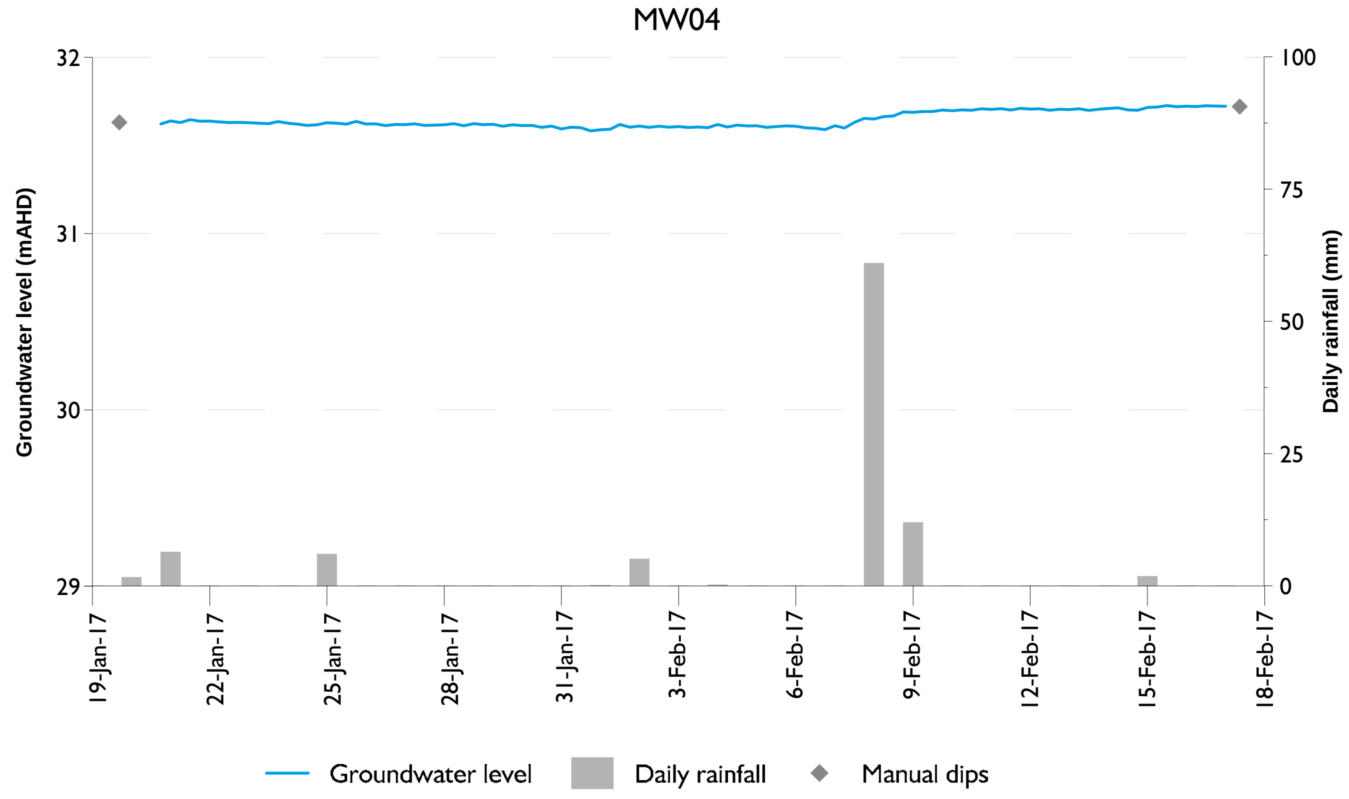




MW01 and MW02 hydrographs

Widemere Water Monitoring Program
Boral Recycling
Figure 2





EMM

MW03 and MW04 hydrographs

Widemere Water Monitoring Program
Boral Recycling
Figure 3

3 Water quality

2.1 Sampling methodology

Water quality sampling was completed on 17 February 2017 using a 12 V submersible pump at the groundwater monitoring bores and using a telescopic sampler to collect water quality samples from the sediment basin. A grab sample was also collected from a surface leak of a water main leaking into Basin 1.

Water quality samples were analysed for a broad chemical suite designed to specifically assess the chemical characteristics of the different hydrogeological units. Samples were collected in bottles specified by the laboratory, with appropriate preservation where required. Samples undergoing dissolved metal analysis were filtered through 0.45 µm filters in the field prior to collection. The samples were analysed by ALS Environmental (Smithfield) a NATA accredited laboratory.

2.2 Results

Complete water quality results are presented in Appendix A. Laboratory certificates of analysis are presented in Appendix B.

Water quality results are compared against the ANZECC/ARMCANZ (2000) guidelines for freshwater ecosystems (south-east Australia – NSW lowland rivers) since rivers are believed to be the ultimate receiving waters for groundwater discharge. However, these water guidelines are often naturally exceeded in many catchments, and should not be considered as water quality objectives or thresholds.

Key findings for this monitoring event are:

- pH conditions in groundwater ranged from slightly acidic to near neutral in the deeper Ashfield Shale monitoring bores (pH 6.22 at MW04 and pH 6.9 at MW01); and were near neutral in the shallow clay seepage monitoring bores (pH 6.81 at MW02 and pH 7.12 at MW03). pH conditions in Basin 2 were slightly alkaline (pH 7.52); the ANZECC/ARMCANZ (2000) guideline value (NSW lowland river ecosystems) was exceeded at MW04;

- salinity ranged from fresh in the clay monitoring bores (562 µS/cm at MW02 and 708 µS/cm at MW03), Basin 2 (383 µS/cm), and the water leak (495 µS/cm) to slightly saline in the Ashfield Shale monitoring bores (3,551 µS/cm at MW04 and 6,851 µS/cm at MW01); and exceeded the ANZECC/ARMCANZ (2000) guideline value (NSW lowland river ecosystems) in the shale;

- the major ion characteristics of the water samples are shown in a piper diagram in Figure 4. Groundwater in the clay monitoring bores (MW02 and MW03) is dominated by sodium and bicarbonate (Na-HCO_3 type); groundwater in the Ashfield Shale monitoring bores (MW01 and MW04) is dominated by sodium and chloride (Na-Cl type); and water in the sediment basin is dominated by sodium with moderate bicarbonate;

- dissolved metal concentrations were generally present in groundwater and in the sediment basin at concentrations below the ANZECC/ARMCANZ (2000) guidelines, with the exception of detections of aluminium in the basin and at MW02, which exceeded the guidelines;

- no hexavalent chromium (Cr-VI) was detected in groundwater or in the sediment basin;

- nutrient concentrations generally exceeded the ANZECC/ARMCANZ (2000) guidelines for total nitrogen and total phosphorus concentrations, with concentrations generally the highest in the clay monitoring bores;

- concentrations of polynuclear aromatic hydrocarbons (PAH), total recoverable hydrocarbons (TRH), total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, total xylenes and naphthalene (BTEXN), and chlorinated hydrocarbons were below the laboratory limit of reporting (LOR), with the exception of detections of TRH ($C_{10} – C_{36}$) and TPH ($C_{10} – C_{40}$) at MW02;
- concentrations of volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs), solvents, pesticides and phthalates were below the laboratory LOR with the exception of detection of phthalates at MW02; and
- concentrations of most analytes in the water main leak sample were comparable to concentrations observed in the sediment basin, with the exception of concentrations of TPH which were detected at higher concentrations in the water leak.

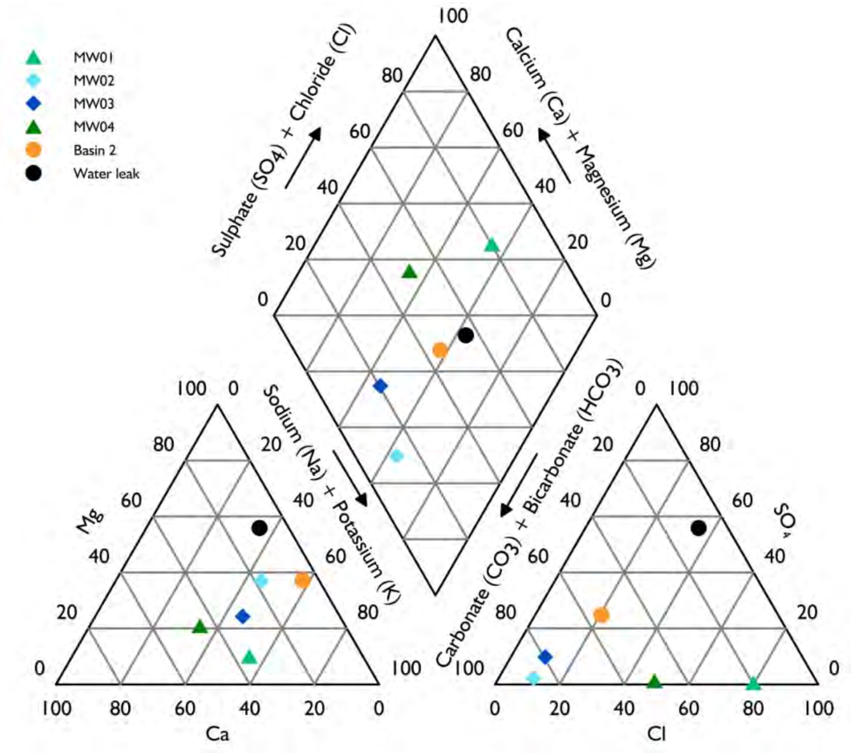


Figure 4 Piper diagram displaying major ion chemistry

4 Conclusions

Water quality results of the February 2017 monitoring round indicate differences between water quality in the clay (seepage) monitoring bores (MW02 and MW03) and in the Ashfield Shale regional groundwater monitoring bores (MW01 and MW04).

A less clear distinction is observed between the seepage monitoring bores and the sediment basin (Appendix A). Based on the available data, no clear conclusion can be made at this stage on the potential for seepage from the sediment basins and the influence of groundwater on the basins.

5 Recommendations

It is recommended that baseline groundwater monitoring continues at a monthly frequency to better characterise the groundwater system and to further assess the potential for seepage from the sediment basins and the influence of groundwater on the basins.

The development conditions requires a groundwater monitoring program (GMP) to be conducted within six months of the commencement of the expanded operations. The data collected to date will be incorporated in the GMP. The GMP will also assess the potential for leakage of the sediment basins; and identify if further groundwater monitoring is required.

Yours sincerely

Carolina Sardella
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Appendix A – Water quality summary tables
Appendix B – Laboratory certificate of analysis

Appendix A

Water quality summary table

Appendix A - Water quality results February 2017

					Site ID	Basin 2	MW01	MW02	MW03	MW04	Water leak
					Sample date	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Chem_Group	**ChemName**	**Units**	**LOR**	ANZECC 2000 FW 95% (extreme hardness)	ANZECC 2000 FW 95% (moderate hardness)						
Field	DO mg/L (Field)_	mg/L				2.52	0.71	2.1	5.47	1.04	2.01
	Electrical conductivity (field)	uS/cm		125-2200	125-2200	383	6,851	562	7.08	3,551	495
	Electrical conductivity (lab)	µS/cm	1	125-2200	125-2200	384	7,900	580	732	4,190	489
	Dissolved oxygen (field)	%				30.5	8.7	23.8	70.3	11.8	22.5
	pH (field)	pH units		6.5-8	6.5-8	7.52	6.9	6.81	7.12	6.22	7.24
	Redox	mV				-86.9	-76.3	-68.9	-83.2	-78.9	16
	Temp (Field)	°C				24.3	27.6	21	28.1	21.2	27.2
	Suspended solids	mg/L	5			202	168,000	20,300	20,600	48	22
	Total dissolved solids (field)	mg/L				249	4,450	364	462	2,307	325
	Total dissolved solids (lab)	mg/L	10			337	6,660	1,060	2,070	2,680	330
Laboratory analytes	Alkalinity (Hydroxide) as CaCO3	mg/L	1			<1	<1	<1	<1	<1	<1
	Alkalinity (total) as CaCO3	mg/L	1			62	434	227	242	692	112
	Bicarbonate Alkalinity-mg CaCO3/L	mg/L	1			62	434	227	242	692	112
	Carbonate Alkalinity-mg CaCO3/L	mg/L	1			<1	<1	<1	<1	<1	<1
	Chloride	mg/L	1			33	2,480	40	46	955	42
	Calcium	mg/L	1			24	159	17	36	182	51
	Fluoride	mg/L	0.01			0.6	0.8	0.7	0.6	0.1	0.8
	Magnesium	mg/L	1			2	337	17	27	237	5
	Potassium	mg/L	1			15	9	1	1	8	8
	Sulfate as SO4 - Turbidimetric	mg/L	1			54	26	11	57	35	46
	Sodium	mg/L	1			34	989	88	77	335	32
Dissolved metals	Aluminium	mg/L	0.01	**0.055**	**0.055**	0.14	<0.01	0.17	0.02	<0.01	0.03
	Arsenic	mg/L	0.001			0.003	0.002	<0.001	<0.001	0.012	0.002
	Barium	mg/L	0.001			0.011	0.986	0.032	0.054	1.47	0.034
	Beryllium	mg/L	0.001			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Cadmium	mg/L	0.0001	**0.002**	**0.0005**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Chromium	mg/L	0.001			0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Cobalt	mg/L	0.001			<0.001	0.004	0.002	<0.001	<0.001	<0.001
	Copper	mg/L	0.001	**0.0126**	**0.0035**	0.002	<0.001	0.003	0.004	<0.001	0.003
	Lead	mg/L	0.001	**0.091**	**0.014**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Manganese	mg/L	0.001	1.9	1.9	0.002	0.863	0.232	0.005	0.162	0.017
	Mercury	mg/L	0.0001	**0.0006**	**0.0006**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Molybdenum	mg/L	0.001			0.012	0.006	0.012	0.018	0.002	0.015
	Nickel	mg/L	0.001	**0.099**	**0.028**	0.002	0.003	0.005	0.002	<0.001	0.001
	Vanadium	mg/L	0.01			0.06	<0.01	<0.01	<0.01	<0.01	0.02
	Zinc	mg/L	0.005	**0.072**	**0.02**	<0.005	<0.005	<0.005	<0.005	0.006	0.005
Metals	Chromium (hexavalent)	µg/L	10	1	1	<10	<10	<10	<10	<10	<10
Nutrients	Ammonia (as N)	mg/L	0.01	0.9	0.9	0.69	0.58	1.27	0.07	0.26	0.14
	Nitrite (as N)	mg/L	0.01			0.42	<0.01	<0.01	<0.01	<0.01	0.03
	Nitrate (as N)	mg/L	0.01			0.3	0.04	0.02	0.14	0.09	0.05
	Nitrogen (Total)	mg/L	0.1	0.35	0.35	2.5	7.6	10	14.3	0.4	1.5
	Kjeldahl Nitrogen Total	µg/L	100			1,800	7,600	10,000	14,200	300	1,400
	Reactive phosphorus (as P)	mg/L	0.01			<0.01	<0.01	0.12	<0.01	<0.01	0.02
	Total phosphorus	mg/L	0.01	0.025	0.025	0.2	4.37	5.39	12.8	0.03	0.08
Phenolic compounds	2-chlorophenol	µg/L	2	490	490	<2	-	<2	<2	-	-
	2-methylphenol	µg/L	2			<2	-	<2	<2	-	-
	3-&4-methylphenol	µg/L	4			<4	-	<4	<4	-	-
	2-nitrophenol	µg/L	2			<2	-	<2	<2	-	-
	2,4-dimethylphenol	µg/L	2			<2	-	<2	<2	-	-
	2,4-dichlorophenol	µg/L	2	160	160	<2	-	<2	<2	-	-
	2,6-dichlorophenol	µg/L	2			<2	-	<2	<2	-	-
	4-chloro-3-methylphenol	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	2,4,6-trichlorophenol	µg/L	2	20	20	<2	-	<2	<2	-	-
	2,4,5-trichlorophenol	µg/L	2			<2	-	<2	<2	-	-
	Phenol	µg/L	2	320	320	<2	-	<2	<2	-	-
	Pentachlorophenol	µg/L	0.1	10	10	<4 - 0.13	-	<0.1	<0.1	-	-
Polycyclic aromatic hydrocarb	Acenaphthene	µg/L	1			<1	<1	<1	<1	<1	<1
	Acenaphthylene	µg/L	1			<1	<1	<1	<1	<1	<1
	Anthracene	µg/L	1			<1	<1	<1	<1	<1	<1
	Benz(a)anthracene	µg/L	1			<1	<1	<1	<1	<1	<1
	Benzo(k)fluoranthene	µg/L	1			<1	<1	<1	<1	<1	<1
	Benzo(b&j)fluoranthene	µg/L	1			<1	<1	<1	<1	<1	<1
	Benzo(a) pyrene	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(a)pyrene TEQ calc (Zero)	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(g,h,i)perylene	µg/L	1			<1	<1	<1	<1	<1	<1
	Chrysene	µg/L	1			<1	<1	<1	<1	<1	<1
	Dibenz(a,h)anthracene	µg/L	1			<1	<1	<1	<1	<1	<1
	Fluorene	µg/L	1			<1	<1	<1	<1	<1	<1
	Fluoranthene	µg/L	1			<1	<1	<1	<1	<1	<1
	Indeno(1,2,3-c,d)pyrene	µg/L	1			<1	<1	<1	<1	<1	<1
	Phenanthrene	µg/L	1			<1	<1	<1	<1	<1	<1
	Polycylic aromatic hydrocarbons EPA448	ug/L	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Pyrene	µg/L	1			<1	<1	<1	<1	<1	<1
Total petroleum hydrocarbons	C 6 - C 9 Fraction	µg/L	20			<20	<20	<20	<20	<20	<20
	C10 - C14 Fraction	µg/L	50			<50	<50	<50	<50	<50	<50
	C15 - C28 Fraction	µg/L	100			<100	<100	560	<100	<100	140
	C29 - C36 Fraction	µg/L	50			<50	<50	230	<50	<50	<50
	TPH+C10 - C36 (Sum of total)	µg/L	50			<50	<50	790	<50	<50	140
Total recoverable hydrocarbons	C6-C10 fraction	µg/L	20			<20	<20	<20	<20	<20	<20
	C6 - C10 fraction minus BTEX	µg/L	20			<20	<20	<20	<20	<20	<20
	C10 - C16 fraction	µg/L	100			<100	<100	<100	<100	<100	<100
	C16 - C34 fraction	µg/L	100			<100	<100	700	110	<100	140
	C34 - C40 fraction	µg/L	100			<100	<100	100	<100	<100	<100
	C10 - C40 fraction (Sum)	µg/L	100			<100	<100	800	110	<100	140
	TRH >C10-C16 less Naphthalene (F2)	µg/L	100			<100	<100	<100	<100	<100	<100
Aromatic hydrocarbons	Benzene	µg/L	1	950	950	<1	<1	<1	<1	<1	<1
	Ethylbenzene	µg/L	2			<2	<2	<2	<2	<2	<2
	Naphthalene	µg/L	1	16	16	<1	<1	<1	<1	<1	<1
	Toluene	µg/L	2			<2	<2	<2	<2	<2	<2

Appendix A - Water quality results February 2017

					Site ID	Basin 2	MW01	MW02	MW03	MW04	Water leak
					Sample date	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Chem_Group	**ChemName**	**Units**	**LOR**	ANZECC 2000 FW 95% (extreme hardness)	ANZECC 2000 FW 95% (moderate hardness)						
	Total BTEX	µg/L	1			<1	<1	<1	<1	<1	<1
	Xylene (m & p)	µg/L	2			<2	<2	<2	<2	<2	<2
	Xylene (o)	µg/L	2	350	350	<2	<2	<2	<2	<2	<2
	Xylene Total	µg/L	2			<2	<2	<2	<2	<2	<2
Ionic balance	Anions Total	meq/L	0.01			3.29	79.2	5.89	7.32	41.5	4.38
	Cations Total	meq/L	0.01			3.22	78.9	6.1	7.39	43.4	4.55
	Ionic Balance	%	0.01			1.06	0.16	1.73	0.5	2.2	1.93
PAH	7,12-dimethylbenz(a)anthracene	µg/L	2			<2	-	<2	<2	-	-
	Azoxystrobin	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Brodifacoum	µg/L	0.05			<0.05	-	<0.05	<0.05	-	-
	Cyproconazole	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Fenoxycarb	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Haloxyfop	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Hexaconazole	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Indoxacarb	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Metalaxyl-M	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Penconazole	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
	Pyrimethanil	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Thiamethoxam	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Carfentrazone-ethyl	mg/L	0.0001			<0.0001	-	<0.0001	<0.0001	-	-
	Cyprodinil	mg/L	0.00001			<0.00001	-	<0.00001	<0.00001	-	-
	Diflufenican	mg/L	0.00002			<0.00002	-	<0.00002	<0.00002	-	-
	Fipronil	mg/L	0.00001			<0.00001	-	<0.00001	<0.00001	-	-
	Flupropanate	mg/L	0.0001			<0.0001	-	<0.0001	<0.0001	-	-
	Imazapyr	mg/L	0.01			<0.01	-	<0.01	<0.01	-	-
	Metaldehyde	mg/L	0.01			<0.01	-	<0.01	<0.01	-	-
	Nicarbazin	mg/L	0.0001			<0.0001	-	<0.0001	<0.0001	-	-
	Nitrite+Nitrate as N	mg/L	0.01			0.72	0.04	0.02	0.14	0.09	0.08
	Pyrasulfotole	mg/L	0.0001			<0.0001	-	<0.0001	<0.0001	-	-
	Pyroxsulam	mg/L	0.0001			<0.0001	-	<0.0001	<0.0001	-	-
	Spirotetramat	mg/L	0.0001			<0.0001	-	<0.0001	<0.0001	-	-
	Toltrazuril	mg/L	0.0001			<0.0001	-	<0.0001	<0.0001	-	-
	Naphthalophos	mg/L	0.001			<0.001	-	<0.001	<0.001	-	-
	Chloroxuron	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Metribuzin	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Oryzalin	µg/L	0.05			<0.05	-	<0.05	<0.05	-	-
	Propachlor	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Vernolate	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Acephate	µg/L	0.5			<0.5	-	<0.5	<0.5	-	-
	Bisphenol A	µg/L	0.05			0.22	-	0.4	1.28	-	-
	Avermectin	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Chlorantraniliprole	mg/L	0.0001			<0.0001	-	<0.0001	<0.0001	-	-
	Chlorothalonil	µg/L	2			<2	-	<2	<2	-	-
	Londax	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Paclobutrazol	µg/L	0.05			<0.05	-	<0.05	<0.05	-	-
	N-Nitrosodiphenyl & Diphenylamine	µg/L	4			<4	-	<4	<4	-	-
	Pyriproxyfen	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Triadimenol	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
Amino Aliphatics	N-nitrosodiethylamine	µg/L	2			<2	-	<2	<2	-	-
	N-nitrosodi-n-butylamine	µg/L	2			<2	-	<2	<2	-	-
	N-nitrosodi-n-propylamine	µg/L	2			<2	-	<2	<2	-	-
	N-Nitrosomethylethylamine	µg/L	2			<2	-	<2	<2	-	-
Amino Aromatics	1-naphthylamine	µg/L	2			<2	-	<2	<2	-	-
Anilines	2-nitroaniline	µg/L	4			<4	-	<4	<4	-	-
	3-nitroaniline	µg/L	4			<4	-	<4	<4	-	-
	4-chloroaniline	µg/L	2			<2	-	<2	<2	-	-
	4-nitroaniline	µg/L	2			<2	-	<2	<2	-	-
	5-nitro-o-toluidine	µg/L	2			<2	-	<2	<2	-	-
	Aniline	µg/L	2	250	250	<2	-	<2	<2	-	-
Carbamates	Propamocarb	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Methiocarb	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
Chlorinated Hydrocarbons	1,1,1,2-tetrachloroethane	µg/L	5			<5	-	<5	<5	-	-
	1,1,1-trichloroethane	µg/L	5			<5	-	<5	<5	-	-
	1,1,2,2-tetrachloroethane	µg/L	5			<5	-	<5	<5	-	-
	1,1,2-trichloroethane	µg/L	5	6500	6500	<5	-	<5	<5	-	-
	1,1-dichloroethane	µg/L	5			<5	-	<5	<5	-	-
	1,1-dichloroethene	µg/L	5			<5	-	<5	<5	-	-
	1,1-dichloropropene	µg/L	5			<5	-	<5	<5	-	-
	1,2,3-trichloropropane	µg/L	5			<5	-	<5	<5	-	-
	1,2-dibromo-3-chloropropane	µg/L	5			<5	-	<5	<5	-	-
	1,2-dichloroethane	µg/L	5			<5	-	<5	<5	-	-
	1,2-dichloropropane	µg/L	5			<5	-	<5	<5	-	-
	1,3-dichloropropane	µg/L	5			<5	-	<5	<5	-	-
	2,2-dichloropropane	µg/L	5			<5	-	<5	<5	-	-
	Bromodichloromethane	µg/L	5			<5	-	<5	<5	-	-
	Bromoform	µg/L	5			<5	-	<5	<5	-	-
	Carbon tetrachloride	µg/L	5			<5	-	<5	<5	-	-
	Chlorodibromomethane	µg/L	5			<5	-	<5	<5	-	-
	Chloroethane	µg/L	50			<50	-	<50	<50	-	-
	Chloroform	µg/L	5			5	-	<5	<5	-	-
	Chloromethane	µg/L	50			<50	-	<50	<50	-	-
	cis-1,2-dichloroethene	µg/L	5			<5	-	<5	<5	-	-
	cis-1,3-dichloropropene	µg/L	5			<5	-	<5	<5	-	-
	Dibromomethane	µg/L	5			<5	-	<5	<5	-	-
	Hexachlorobutadiene	µg/L	2			<2	-	<2	<2	-	-
	Hexachlorocyclopentadiene	µg/L	10			<10	-	<10	<10	-	-
	Hexachloroethane	µg/L	2	360	360	<2	-	<2	<2	-	-
	Trichloroethene	µg/L	5			<5	-	<5	<5	-	-
	Tetrachloroethene	µg/L	5			<5	-	<5	<5	-	-

Appendix A - Water quality results February 2017

					Site ID	Basin 2	MW01	MW02	MW03	MW04	Water leak
					Sample date	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Chem_Group	**ChemName**	**Units**	**LOR**	ANZECC 2000 FW 95% (extreme hardness)	ANZECC 2000 FW 95% (moderate hardness)						
	trans-1,2-dichloroethene	µg/L	5			<5	-	<5	<5	-	-
	trans-1,3-dichloropropene	µg/L	5			<5	-	<5	<5	-	-
	Vinyl chloride	µg/L	50			<50	-	<50	<50	-	-
Explosives	1,3,5-Trinitrobenzene	µg/L	2			<2	-	<2	<2	-	-
	2,4-Dinitrotoluene	µg/L	4	65	65	<4	-	<4	<4	-	-
	2,6-dinitrotoluene	µg/L	4			<4	-	<4	<4	-	-
	Nitrobenzene	µg/L	2	550	550	<2	-	<2	<2	-	-
Fungicides	Benomyl	µg/L	0.01			0.18	-	<0.01	<0.01	-	-
	Carbendazim	µg/L	0.1			0.2	-	<0.1	<0.1	-	-
	Carboxin	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Difenoconazole	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Etridiazole	µg/L	0.5			<0.5	-	<0.5	<0.5	-	-
	Fenarimol	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Fosetyl-al	µg/L	10			<10	-	<10	<10	-	-
	Iprodione	µg/L	0.05			<0.05	-	<0.05	<0.05	-	-
	Metalaxyl	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	NuStar	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Prochloraz	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Propiconazole	µg/L	0.05			<0.05	-	<0.05	<0.05	-	-
	Systhane	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Triadimefon	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
Halogenated Benzenes	1,2,3-trichlorobenzene	µg/L	5	10	10	<5	-	<5	<5	-	-
	1,2,4-trichlorobenzene	µg/L	2	170	170	<2	-	<2	<2	-	-
	1,2-dichlorobenzene	µg/L	2	160	160	<2	-	<2	<2	-	-
	1,3-dichlorobenzene	µg/L	2	260	260	<2	-	<2	<2	-	-
	1,4-dichlorobenzene	µg/L	2	60	60	<2	-	<2	<2	-	-
	2-chlorotoluene	µg/L	5			<5	-	<5	<5	-	-
	4-chlorotoluene	µg/L	5			<5	-	<5	<5	-	-
	Bromobenzene	µg/L	5			<5	-	<5	<5	-	-
	Chlorobenzene	µg/L	5			<5	-	<5	<5	-	-
	Hexachlorobenzene	µg/L	4			<4	-	<4	<4	-	-
	Pentachlorobenzene	µg/L	2			<2	-	<2	<2	-	-
Halogenated Hydrocarbons	1,2-dibromoethane	µg/L	5			<5	-	<5	<5	-	-
	Bromomethane	µg/L	50			<50	-	<50	<50	-	-
	Dichlorodifluoromethane	µg/L	50			<50	-	<50	<50	-	-
	Iodomethane	µg/L	5			<5	-	<5	<5	-	-
	Trichlorofluoromethane	µg/L	50			<50	-	<50	<50	-	-
Herbicides	Ametryn	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
	Asulam	µg/L	2			<2	-	<2	<2	-	-
	Atrazine	µg/L	0.01	13	13	<0.01	-	<0.01	<0.01	-	-
	Bromacil	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Bromoxynil	µg/L	0.05			<0.05	-	<0.05	<0.05	-	-
	Butachlor	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Chlorsulfuron	µg/L	0.2			<0.2	-	<0.2	<0.2	-	-
	Cyanazine	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Dalapon	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Dichlobenil	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Diclofop-methyl	µg/L	0.05			<0.05	-	<0.05	<0.05	-	-
	Dinoseb	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Diphenamid	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Diuron	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Endothall	µg/L	1			<1	-	<1	<1	-	-
	EPTC (S-Ethyl dipropylthiocarbamate)	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Flamprop-methyl	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Fluometuron	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
	Hexaflurate	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Hexazinone	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Isoproturon	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Metachlor	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Metolachlor	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
	Molinate	µg/L	0.1	3.4	3.4	<0.1	-	<0.1	<0.1	-	-
	Napropamide	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Nitralin	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Norflurazon	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Oxyfluorfen	µg/L	1			<1	-	<1	<1	-	-
	Pebulate	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Pendimethalin	µg/L	0.05			<0.05	-	<0.05	<0.05	-	-
	Prometryn	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
	Pronamide	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Propanil	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Propazine	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
	Simazine	µg/L	0.02	3.2	3.2	<0.02	-	<0.02	<0.02	-	-
	Tebuthiuron	µg/L	0.02	2.2	2.2	<0.02	-	<0.02	<0.02	-	-
	Terbacil	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Terbutryn	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
	Thiobencarb	µg/L	0.01	2.8	2.8	<0.01	-	<0.01	<0.01	-	-
	Trifluralin	µg/L	10	4.4	4.4	<10	-	<10	<10	-	-
Inorganics	Gallium	µg/L	1			<1	<1	<1	<1	<1	<1
MAH	1,2,4-trimethylbenzene	µg/L	5			<5	-	<5	<5	-	-
	1,3,5-trimethylbenzene	µg/L	5			<5	-	<5	<5	-	-
	Isopropylbenzene	µg/L	5			<5	-	<5	<5	-	-
	n-butylbenzene	µg/L	5			<5	-	<5	<5	-	-
	n-propylbenzene	µg/L	5			<5	-	<5	<5	-	-
	p-isopropyltoluene	µg/L	5			<5	-	<5	<5	-	-
	sec-butylbenzene	µg/L	5			<5	-	<5	<5	-	-
	Styrene	µg/L	5			<5	-	<5	<5	-	-
	tert-butylbenzene	µg/L	5			<5	-	<5	<5	-	-
Nitroaromatics	2-Picoline	µg/L	2			<2	-	<2	<2	-	-
	4-aminobiphenyl	µg/L	2			<2	-	<2	<2	-	-

Appendix A - Water quality results February 2017

					Site ID	Basin 2	MW01	MW02	MW03	MW04	Water leak
					Sample date	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Chem_Group	**ChemName**	**Units**	**LOR**	ANZECC 2000 FW 95% (extreme hardness)	ANZECC 2000 FW 95% (moderate hardness)						
	Pentachloronitrobenzene	µg/L	2			<2	-	<2	<2	-	-
Organic	Terbutylazine	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
Organochlorine Pesticides	4,4-DDE	µg/L	2			<2	-	<2	<2	-	-
	a-BHC	µg/L	2			<2	-	<2	<2	-	-
	Aldrin	µg/L	2			<2	-	<2	<2	-	-
	Aldrin + Dieldrin	µg/L	4			<4	-	<4	<4	-	-
	b-BHC	µg/L	2			<2	-	<2	<2	-	-
	d-BHC	µg/L	2			<2	-	<2	<2	-	-
	DDD	µg/L	2			<2	-	<2	<2	-	-
	DDT	µg/L	4	0.01	0.01	<4	-	<4	<4	-	-
	DDT+DDE+DDD	µg/L	4			<4	-	<4	<4	-	-
	Dicofol	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Dieldrin	µg/L	2			<2	-	<2	<2	-	-
	Endosulfan I	µg/L	2			<2	-	<2	<2	-	-
	Endosulfan II	µg/L	2			<2	-	<2	<2	-	-
	Endosulfan sulphate	µg/L	2			<2	-	<2	<2	-	-
	Endrin	µg/L	2	0.02	0.02	<2	-	<2	<2	-	-
	g-BHC (Lindane)	µg/L	2	0.2	0.2	<2	-	<2	<2	-	-
	Heptachlor	µg/L	2	0.09	0.09	<2	-	<2	<2	-	-
	Heptachlor epoxide	µg/L	2			<2	-	<2	<2	-	-
Organophosphorous Pesticides	Azinophos methyl	µg/L	0.02	0.02	0.02	<0.02	-	<0.02	<0.02	-	-
	Bolstar (Sulprofos)	µg/L	0.05			<0.05	-	<0.05	<0.05	-	-
	Bromophos-ethyl	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Carbophenothion	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Azinphos Ethyl	mg/L	0.00002			<0.00002	-	<0.00002	<0.00002	-	-
	Chlorfenvinphos	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Chlorpyrifos	µg/L	0.02	0.01	0.01	<0.02	-	<0.02	<0.02	-	-
	Chlorpyrifos-methyl	µg/L	0.2			<0.2	-	<0.2	<0.2	-	-
	Coumaphos	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
	Demeton-O	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Demeton-S	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Diazinon	µg/L	0.01	0.01	0.01	<0.01	-	<0.01	<0.01	-	-
	Dichlorvos	µg/L	0.2			<0.2	-	<0.2	<0.2	-	-
	Dimethoate	µg/L	0.02	0.15	0.15	<0.02	-	<0.02	<0.02	-	-
	Disulfoton	µg/L	0.05			<0.05	-	<0.05	<0.05	-	-
	Ethion	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Ethoprop	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
	Fenitrothion	µg/L	2	0.2	0.2	<2	-	<2	<2	-	-
	Fensulfothion	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
	Fenthion	µg/L	0.05			<0.05	-	<0.05	<0.05	-	-
	Malathion	µg/L	0.02	0.05	0.05	<0.02	-	<0.02	<0.02	-	-
	Methidathion	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Methyl parathion	µg/L	2			<2	-	<2	<2	-	-
	Mevinphos (Phosdrin)	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Monocrotophos	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Omethoate	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
	Phorate	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Prothiofos	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Pyrazophos	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Ronnel	µg/L	10			<10	-	<10	<10	-	-
	Terbufos	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
	Thiometon	µg/L	0.5			<0.5	-	<0.5	<0.5	-	-
	Trichloronate	µg/L	0.5			<0.5	-	<0.5	<0.5	-	-
	Tetrachlorvinphos	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
Other	Tebuconazole	mg/L	0.00001			<0.00001	-	<0.00001	<0.00001	-	-
	Triazophos	mg/L	0.000005			<0.000005	-	<0.000005	<0.000005	-	-
PAH/Phenols	2,4-dinitrophenol	µg/L	0.01	45	45	<0.01	-	<0.01	<0.01	-	-
	2-chloronaphthalene	µg/L	2			<2	-	<2	<2	-	-
	2-methylnaphthalene	µg/L	2			<2	-	<2	<2	-	-
	3-methylcholanthrene	µg/L	2			<2	-	<2	<2	-	-
	4,6-Dinitro-2-methylphenol	µg/L	0.05			<0.05	-	<0.05	<0.05	-	-
	4-nitrophenol	µg/L	0.1			0.13	-	<0.1	<0.1	-	-
	Acetophenone	µg/L	2			<2	-	<2	<2	-	-
Pesticides	3-Hydroxy Carbofuran	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Aldicarb	µg/L	0.05			<0.05	-	<0.05	<0.05	-	-
	Amitraz	µg/L	100			<100	-	<100	<100	-	-
	Bendiocarb	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Carbaryl	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
	Carbofuran	µg/L	0.01	1.2	1.2	<0.01	-	<0.01	<0.01	-	-
	Chlorobenzilate	µg/L	2			<2	-	<2	<2	-	-
	Cyromazine	µg/L	0.05			<0.05	-	<0.05	<0.05	-	-
	Demeton-S-methyl	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Diflubenzuron	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Fenamiphos	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
	Formothion	µg/L	20			<20	-	<20	<20	-	-
	Methomyl	µg/L	0.01	3.5	3.5	<0.01	-	<0.01	<0.01	-	-
	Oxamyl	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
	Parathion	µg/L	0.2	0.004	0.004	<0.2	-	<0.2	<0.2	-	-
	Pirimicarb	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Pirimiphos-methyl	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
	Pirimphos-ethyl	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
	Profenofos	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
	Promecarb	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Propargite	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Sulfotepp	µg/L	0.005			<0.005	-	<0.005	<0.005	-	-
	Temephos	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Trichlorfon	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Thiodicarb	µg/L	0.01			<0.01	-	<0.01	<0.01	-	-
Pesticides by	Aminopyralid	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-

Appendix A - Water quality results February 2017

					Site ID	Basin 2	MW01	MW02	MW03	MW04	Water leak
					Sample date	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Chem_Group	**ChemName**	**Units**	**LOR**	ANZECC 2000 FW 95% (extreme hardness)	ANZECC 2000 FW 95% (moderate hardness)						
LCMSMS (Positive	Novaluron	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Rimsulfuron	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Irgarol	µg/L	0.002			<0.002	-	<0.002	<0.002	-	-
	Siduron	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Bensulide	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Boscalid	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Atrazine-desethyl	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Atrazine-desisopropyl	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Demeton-O & Demeton-S	µg/L	0.02			<0.02	-	<0.02	<0.02	-	-
	Iodosulfuron methyl	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Pyraclostrobin	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Quinclorac	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Trinexapac Ethyl	µg/L	1			<1	-	<1	<1	-	-
	Tetraconazole	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Trifloxysulfuron-sodium	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
Phenolics and other Polar Comp	4-Nonylphenol (mixture of isomers)	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
Phthalates	Bis(2-ethylhexyl) phthalate	µg/L	10			<10	-	669	<10	-	-
	Butyl benzyl phthalate	µg/L	2			<2	-	<2	<2	-	-
	Diethylphthalate	µg/L	2	1000	1000	<2	-	<2	<2	-	-
	Dimethyl phthalate	µg/L	2	3700	3700	<2	-	<2	<2	-	-
	Di-n-butyl phthalate	µg/L	2	26	26	<2	-	<2	<2	-	-
	Di-n-octyl phthalate	µg/L	2			<2	-	4	<2	-	-
Solvents	2-butanone (MEK)	µg/L	50			<50	-	<50	<50	-	-
	2-hexanone (MBK)	µg/L	50			<50	-	<50	<50	-	-
	4-Methyl-2-pentanone	µg/L	50			<50	-	<50	<50	-	-
	Carbon disulfide	µg/L	5			<5	-	<5	<5	-	-
	Isophorone	µg/L	2			<2	-	<2	<2	-	-
	Vinyl acetate	µg/L	50			<50	-	<50	<50	-	-
SVOCs	2-(acetylamino) fluorene	µg/L	2			<2	-	<2	<2	-	-
	3,3-Dichlorobenzidine	µg/L	2			<2	-	<2	<2	-	-
	4-(dimethylamino) azobenzene	µg/L	2			<2	-	<2	<2	-	-
	4-bromophenyl phenyl ether	µg/L	2			<2	-	<2	<2	-	-
	4-chlorophenyl phenyl ether	µg/L	2			<2	-	<2	<2	-	-
	4-Nitroquinoline-N-oxide	µg/L	2			<2	-	<2	<2	-	-
	Azobenzene	µg/L	2			<2	-	<2	<2	-	-
	Bis(2-chloroethoxy) methane	µg/L	2			<2	-	<2	<2	-	-
	Bis(2-chloroethyl)ether	µg/L	2			<2	-	<2	<2	-	-
	Carbazole	µg/L	2			<2	-	<2	<2	-	-
	Dibenzofuran	µg/L	2			<2	-	<2	<2	-	-
	EPN	µg/L	0.05			<0.05	-	<0.05	<0.05	-	-
	Hexachlorophene	µg/L	0.1			<0.1	-	<0.1	<0.1	-	-
	Hexachloropropene	µg/L	2			<2	-	<2	<2	-	-
	Methapyrilene	µg/L	2			<2	-	<2	<2	-	-
	N-nitrosomorpholine	µg/L	2			<2	-	<2	<2	-	-
	N-nitrosopiperidine	µg/L	2			<2	-	<2	<2	-	-
	N-nitrosopyrrolidine	µg/L	4			<4	-	<4	<4	-	-
	Phenacetin	µg/L	2			<2	-	<2	<2	-	-
VOCs	cis-1,4-Dichloro-2-butene	µg/L	5			<5	-	<5	<5	-	-
	trans-1,4-Dichloro-2-butene	µg/L	5			<5	-	<5	<5	-	-
	Pentachloroethane	µg/L	5			<5	-	<5	<5	-	-

Bold values have been corrected for moderate water hardness as follows based on ANZECC/ARMCANZ (2000) Table 3.4.4:

1. Moderate hardness (60 - 119 mg/L as CaCO3): MW02, MW03, Basin 1 and Basin 2; and
2. Extreme hardness (>240 mg/L as CaCO3): MW01 and MW04.

Appendix B

Laboratory certificate of analysis

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1703849**	Page	: 1 of 22
Amendment	: **1**		
Client	: **EMM CONSULTING PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS CAROLINA SARDELLA	Contact	: Customer Services ES
Address	: Ground Floor Suite 1 20 Chandos Street St Leonards NSW 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9493 9500	Telephone	: +61-2-8784 8555
Project	: J17004	Date Samples Received	: 17-Feb-2017 19:45
Order number	: ----	Date Analysis Commenced	: 18-Feb-2017
C-O-C number	: SYBQ-202-16 EMM	Issue Date	: 07-Mar-2017 11:14
Sampler	: Scarolina Sardella		
Site	: ----		
Quote number	: SYBQ/202/15		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ashesh Patel	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Dian Dao		Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- EK071G: Poor spike recovery for Reactive Phosphorus due to matrix interferences(confirmed by re-analysis).
- EG050G: Poor spike recovery for Hexavalent Chromium due to matrix interferences(confirmed by re-analysis).
- TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- EP075: 'Sum of PAH' is the sum of the USEPA 16 priority PAHs
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**7900**	**580**	**732**	**4190**	**384**
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	**6660**	**1060**	**2070**	**2680**	**337**
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**168000**	**20300**	**20600**	----	----
Suspended Solids (SS)	----	5	mg/L	----	----	----	**48**	**202**
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**434**	**227**	**242**	**692**	**62**
Total Alkalinity as CaCO3	----	1	mg/L	**434**	**227**	**242**	**692**	**62**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**26**	**11**	**57**	**35**	**54**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**2480**	**40**	**46**	**955**	**33**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**159**	**17**	**36**	**182**	**24**
Magnesium	7439-95-4	1	mg/L	**337**	**17**	**27**	**237**	**2**
Sodium	7440-23-5	1	mg/L	**989**	**88**	**77**	**335**	**34**
Potassium	7440-09-7	1	mg/L	**9**	**1**	**1**	**8**	**15**
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	**0.17**	**0.02**	<0.01	**0.14**
Arsenic	7440-38-2	0.001	mg/L	**0.002**	<0.001	<0.001	**0.012**	**0.003**
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	7440-39-3	0.001	mg/L	**0.986**	**0.032**	**0.054**	**1.47**	**0.011**
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	**0.001**
Cobalt	7440-48-4	0.001	mg/L	**0.004**	**0.002**	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	<0.001	**0.003**	**0.004**	<0.001	**0.002**
Gallium	7440-55-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	**0.863**	**0.232**	**0.005**	**0.162**	**0.002**
Molybdenum	7439-98-7	0.001	mg/L	**0.006**	**0.012**	**0.018**	**0.002**	**0.012**
Nickel	7440-02-0	0.001	mg/L	**0.003**	**0.005**	**0.002**	<0.001	**0.002**

Analytical Results

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

			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	**0.06**
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	**0.006**	<0.005
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.8**	**0.7**	**0.6**	**0.1**	**0.6**
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.58**	**1.27**	**0.07**	**0.26**	**0.69**
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	**0.42**
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.04**	**0.02**	**0.14**	**0.09**	**0.30**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.04**	**0.02**	**0.14**	**0.09**	**0.72**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**7.6**	**10.0**	**14.2**	**0.3**	**1.8**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**7.6**	**10.0**	**14.3**	**0.4**	**2.5**
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**4.37**	**5.39**	**12.8**	**0.03**	**0.20**
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	**0.12**	<0.01	<0.01	<0.01
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	**79.2**	**5.89**	**7.32**	**41.5**	**3.29**
Total Cations	----	0.01	meq/L	**78.9**	**6.10**	**7.39**	**43.4**	**3.22**
Ionic Balance	----	0.01	%	**0.16**	**1.73**	**0.50**	**2.20**	**1.06**
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	5	µg/L	----	<5	<5	----	<5
Isopropylbenzene	98-82-8	5	µg/L	----	<5	<5	----	<5
n-Propylbenzene	103-65-1	5	µg/L	----	<5	<5	----	<5
1.3.5-Trimethylbenzene	108-67-8	5	µg/L	----	<5	<5	----	<5

Analytical Results

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

			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP074A: Monocyclic Aromatic Hydrocarbons - Continued								
sec-Butylbenzene	135-98-8	5	µg/L	----	<5	<5	----	<5
1.2.4-Trimethylbenzene	95-63-6	5	µg/L	----	<5	<5	----	<5
tert-Butylbenzene	98-06-6	5	µg/L	----	<5	<5	----	<5
p-Isopropyltoluene	99-87-6	5	µg/L	----	<5	<5	----	<5
n-Butylbenzene	104-51-8	5	µg/L	----	<5	<5	----	<5
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	50	µg/L	----	<50	<50	----	<50
2-Butanone (MEK)	78-93-3	50	µg/L	----	<50	<50	----	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	----	<50	<50	----	<50
2-Hexanone (MBK)	591-78-6	50	µg/L	----	<50	<50	----	<50
EP074C: Sulfonated Compounds								
Carbon disulfide	75-15-0	5	µg/L	----	<5	<5	----	<5
EP074D: Fumigants								
2.2-Dichloropropane	594-20-7	5	µg/L	----	<5	<5	----	<5
1.2-Dichloropropane	78-87-5	5	µg/L	----	<5	<5	----	<5
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	----	<5	<5	----	<5
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	----	<5	<5	----	<5
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	----	<5	<5	----	<5
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	50	µg/L	----	<50	<50	----	<50
Chloromethane	74-87-3	50	µg/L	----	<50	<50	----	<50
Vinyl chloride	75-01-4	50	µg/L	----	<50	<50	----	<50
Bromomethane	74-83-9	50	µg/L	----	<50	<50	----	<50
Chloroethane	75-00-3	50	µg/L	----	<50	<50	----	<50
Trichlorofluoromethane	75-69-4	50	µg/L	----	<50	<50	----	<50
1.1-Dichloroethene	75-35-4	5	µg/L	----	<5	<5	----	<5
Iodomethane	74-88-4	5	µg/L	----	<5	<5	----	<5
trans-1.2-Dichloroethene	156-60-5	5	µg/L	----	<5	<5	----	<5
1.1-Dichloroethane	75-34-3	5	µg/L	----	<5	<5	----	<5
cis-1.2-Dichloroethene	156-59-2	5	µg/L	----	<5	<5	----	<5
1.1.1-Trichloroethane	71-55-6	5	µg/L	----	<5	<5	----	<5
1.1-Dichloropropylene	563-58-6	5	µg/L	----	<5	<5	----	<5
Carbon Tetrachloride	56-23-5	5	µg/L	----	<5	<5	----	<5
1.2-Dichloroethane	107-06-2	5	µg/L	----	<5	<5	----	<5

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued								
Trichloroethene	79-01-6	5	µg/L	----	<5	<5	----	<5
Dibromomethane	74-95-3	5	µg/L	----	<5	<5	----	<5
1.1.2-Trichloroethane	79-00-5	5	µg/L	----	<5	<5	----	<5
1.3-Dichloropropane	142-28-9	5	µg/L	----	<5	<5	----	<5
Tetrachloroethene	127-18-4	5	µg/L	----	<5	<5	----	<5
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	----	<5	<5	----	<5
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	----	<5	<5	----	<5
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	----	<5	<5	----	<5
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	----	<5	<5	----	<5
1.2.3-Trichloropropane	96-18-4	5	µg/L	----	<5	<5	----	<5
Pentachloroethane	76-01-7	5	µg/L	----	<5	<5	----	<5
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	----	<5	<5	----	<5
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	5	µg/L	----	<5	<5	----	<5
Bromobenzene	108-86-1	5	µg/L	----	<5	<5	----	<5
2-Chlorotoluene	95-49-8	5	µg/L	----	<5	<5	----	<5
4-Chlorotoluene	106-43-4	5	µg/L	----	<5	<5	----	<5
1.2.3-Trichlorobenzene	87-61-6	5	µg/L	----	<5	<5	----	<5
EP074G: Trihalomethanes								
Chloroform	67-66-3	5	µg/L	----	<5	<5	----	**5**
Bromodichloromethane	75-27-4	5	µg/L	----	<5	<5	----	<5
Dibromochloromethane	124-48-1	5	µg/L	----	<5	<5	----	<5
Bromoform	75-25-2	5	µg/L	----	<5	<5	----	<5
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

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

			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
EP075A: Phenolic Compounds								
Phenol	108-95-2	2	µg/L	----	<2	<2	----	<2
2-Chlorophenol	95-57-8	2	µg/L	----	<2	<2	----	<2
2-Methylphenol	95-48-7	2	µg/L	----	<2	<2	----	<2
3- & 4-Methylphenol	1319-77-3	4	µg/L	----	<4	<4	----	<4
2-Nitrophenol	88-75-5	2	µg/L	----	<2	<2	----	<2
2.4-Dimethylphenol	105-67-9	2	µg/L	----	<2	<2	----	<2
2.4-Dichlorophenol	120-83-2	2	µg/L	----	<2	<2	----	<2
2.6-Dichlorophenol	87-65-0	2	µg/L	----	<2	<2	----	<2
4-Chloro-3-methylphenol	59-50-7	2	µg/L	----	<2	<2	----	<2
2.4.6-Trichlorophenol	88-06-2	2	µg/L	----	<2	<2	----	<2
2.4.5-Trichlorophenol	95-95-4	2	µg/L	----	<2	<2	----	<2
Pentachlorophenol	87-86-5	4	µg/L	----	<4	<4	----	<4
EP075B: Polynuclear Aromatic Hydrocarbons								
2-Methylnaphthalene	91-57-6	2	µg/L	----	<2	<2	----	<2
2-Chloronaphthalene	91-58-7	2	µg/L	----	<2	<2	----	<2
N-2-Fluorenyl Acetamide	53-96-3	2	µg/L	----	<2	<2	----	<2
7.12-Dimethylbenz(a)anthracene	57-97-6	2	µg/L	----	<2	<2	----	<2
3-Methylcholanthrene	56-49-5	2	µg/L	----	<2	<2	----	<2
EP075C: Phthalate Esters								
Dimethyl phthalate	131-11-3	2	µg/L	----	<2	<2	----	<2
Diethyl phthalate	84-66-2	2	µg/L	----	<2	<2	----	<2
Di-n-butyl phthalate	84-74-2	2	µg/L	----	<2	<2	----	<2
Butyl benzyl phthalate	85-68-7	2	µg/L	----	<2	<2	----	<2
bis(2-ethylhexyl) phthalate	117-81-7	10	µg/L	----	**669**	<10	----	<10
Di-n-octylphthalate	117-84-0	2	µg/L	----	**4**	<2	----	<2

Analytical Results

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

			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP075D: Nitrosamines								
N-Nitrosomethylethylamine	10595-95-6	2	µg/L	----	<2	<2	----	<2
N-Nitrosodiethylamine	55-18-5	2	µg/L	----	<2	<2	----	<2
N-Nitrosopyrrolidine	930-55-2	4	µg/L	----	<4	<4	----	<4
N-Nitrosomorpholine	59-89-2	2	µg/L	----	<2	<2	----	<2
N-Nitrosodi-n-propylamine	621-64-7	2	µg/L	----	<2	<2	----	<2
N-Nitrosopiperidine	100-75-4	2	µg/L	----	<2	<2	----	<2
N-Nitrosodibutylamine	924-16-3	2	µg/L	----	<2	<2	----	<2
N-Nitrosodiphenyl & Diphenylamine	86-30-6 122-39-4	4	µg/L	----	<4	<4	----	<4
Methapyrilene	91-80-5	2	µg/L	----	<2	<2	----	<2
EP075E: Nitroaromatics and Ketones								
2-Picoline	109-06-8	2	µg/L	----	<2	<2	----	<2
Acetophenone	98-86-2	2	µg/L	----	<2	<2	----	<2
Nitrobenzene	98-95-3	2	µg/L	----	<2	<2	----	<2
Isophorone	78-59-1	2	µg/L	----	<2	<2	----	<2
2.6-Dinitrotoluene	606-20-2	4	µg/L	----	<4	<4	----	<4
2.4-Dinitrotoluene	121-14-2	4	µg/L	----	<4	<4	----	<4
1-Naphthylamine	134-32-7	2	µg/L	----	<2	<2	----	<2
4-Nitroquinoline-N-oxide	56-57-5	2	µg/L	----	<2	<2	----	<2
5-Nitro-o-toluidine	99-55-8	2	µg/L	----	<2	<2	----	<2
Azobenzene	103-33-3	2	µg/L	----	<2	<2	----	<2
1.3.5-Trinitrobenzene	99-35-4	2	µg/L	----	<2	<2	----	<2
Phenacetin	62-44-2	2	µg/L	----	<2	<2	----	<2
4-Aminobiphenyl	92-67-1	2	µg/L	----	<2	<2	----	<2
Pentachloronitrobenzene	82-68-8	2	µg/L	----	<2	<2	----	<2
Pronamide	23950-58-5	2	µg/L	----	<2	<2	----	<2
Dimethylaminoazobenzene	60-11-7	2	µg/L	----	<2	<2	----	<2
Chlorobenzilate	510-15-6	2	µg/L	----	<2	<2	----	<2
EP075F: Haloethers								
Bis(2-chloroethyl) ether	111-44-4	2	µg/L	----	<2	<2	----	<2
Bis(2-chloroethoxy) methane	111-91-1	2	µg/L	----	<2	<2	----	<2
4-Chlorophenyl phenyl ether	7005-72-3	2	µg/L	----	<2	<2	----	<2
4-Bromophenyl phenyl ether	101-55-3	2	µg/L	----	<2	<2	----	<2
EP075G: Chlorinated Hydrocarbons								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP075G: Chlorinated Hydrocarbons - Continued								
1.3-Dichlorobenzene	541-73-1	2	µg/L	----	<2	<2	----	<2
1.4-Dichlorobenzene	106-46-7	2	µg/L	----	<2	<2	----	<2
1.2-Dichlorobenzene	95-50-1	2	µg/L	----	<2	<2	----	<2
Hexachloroethane	67-72-1	2	µg/L	----	<2	<2	----	<2
1.2.4-Trichlorobenzene	120-82-1	2	µg/L	----	<2	<2	----	<2
Hexachloropropylene	1888-71-7	2	µg/L	----	<2	<2	----	<2
Hexachlorobutadiene	87-68-3	2	µg/L	----	<2	<2	----	<2
Hexachlorocyclopentadiene	77-47-4	10	µg/L	----	<10	<10	----	<10
Pentachlorobenzene	608-93-5	2	µg/L	----	<2	<2	----	<2
Hexachlorobenzene (HCB)	118-74-1	4	µg/L	----	<4	<4	----	<4
EP075H: Anilines and Benzidines								
Aniline	62-53-3	2	µg/L	----	<2	<2	----	<2
4-Chloroaniline	106-47-8	2	µg/L	----	<2	<2	----	<2
2-Nitroaniline	88-74-4	4	µg/L	----	<4	<4	----	<4
3-Nitroaniline	99-09-2	4	µg/L	----	<4	<4	----	<4
Dibenzofuran	132-64-9	2	µg/L	----	<2	<2	----	<2
4-Nitroaniline	100-01-6	2	µg/L	----	<2	<2	----	<2
Carbazole	86-74-8	2	µg/L	----	<2	<2	----	<2
3.3`-Dichlorobenzidine	91-94-1	2	µg/L	----	<2	<2	----	<2
EP075I: Organochlorine Pesticides								
alpha-BHC	319-84-6	2	µg/L	----	<2	<2	----	<2
beta-BHC	319-85-7	2	µg/L	----	<2	<2	----	<2
gamma-BHC	58-89-9	2	µg/L	----	<2	<2	----	<2
delta-BHC	319-86-8	2	µg/L	----	<2	<2	----	<2
Heptachlor	76-44-8	2	µg/L	----	<2	<2	----	<2
Aldrin	309-00-2	2	µg/L	----	<2	<2	----	<2
Heptachlor epoxide	1024-57-3	2	µg/L	----	<2	<2	----	<2
alpha-Endosulfan	959-98-8	2	µg/L	----	<2	<2	----	<2
4.4`-DDE	72-55-9	2	µg/L	----	<2	<2	----	<2
Dieldrin	60-57-1	2	µg/L	----	<2	<2	----	<2
Endrin	72-20-8	2	µg/L	----	<2	<2	----	<2
beta-Endosulfan	33213-65-9	2	µg/L	----	<2	<2	----	<2
4.4`-DDD	72-54-8	2	µg/L	----	<2	<2	----	<2
Endosulfan sulfate	1031-07-8	2	µg/L	----	<2	<2	----	<2

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP075I: Organochlorine Pesticides - Continued								
4.4`-DDT	50-29-3	4	µg/L	----	<4	<4	----	<4
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	4	µg/L	----	<4	<4	----	<4
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	4	µg/L	----	<4	<4	----	<4
EP075J: Organophosphorus Pesticides								
Dichlorvos	62-73-7	2	µg/L	----	<2	<2	----	<2
Dimethoate	60-51-5	2	µg/L	----	<2	<2	----	<2
Diazinon	333-41-5	2	µg/L	----	<2	<2	----	<2
Chlorpyrifos-methyl	5598-13-0	2	µg/L	----	<2	<2	----	<2
Malathion	121-75-5	2	µg/L	----	<2	<2	----	<2
Fenthion	55-38-9	2	µg/L	----	<2	<2	----	<2
Chlorpyrifos	2921-88-2	2	µg/L	----	<2	<2	----	<2
Pirimphos-ethyl	23505-41-1	2	µg/L	----	<2	<2	----	<2
Chlorfenvinphos	470-90-6	2	µg/L	----	<2	<2	----	<2
Prothiofos	34643-46-4	2	µg/L	----	<2	<2	----	<2
Ethion	563-12-2	2	µg/L	----	<2	<2	----	<2
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	**560**	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	**230**	<50	<50	<50
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	**790**	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	**700**	**110**	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	**100**	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	**800**	**110**	<100	<100
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	<100	<100	<100	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2

Analytical Results

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

			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ **Total Xylenes**	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ **Sum of BTEX**	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP234: Multiresidue Pesticides								
3-Hydroxy Carbofuran	16655-82-6	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Abamectin	71751-41-2	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Acephate	30560-19-1	0.5	µg/L	----	<0.5	<0.5	----	<0.5
Alachlor	15972-60-8	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Aldicarb	116-06-3	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Ametryn	834-12-8	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Aminopyralid	150114-71-9	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Amitraz	33089-61-1	100	µg/L	----	<100	<100	----	<100
Asulam	3337-71-1	2	µg/L	----	<2	<2	----	<2
Atrazine	1912-24-9	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Atrazine-desethyl	6190-65-4	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Atrazine-desisopropyl	1007-28-9	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Azinphos-ethyl	2642-71-9	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Azinphos-methyl	86-50-0	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Azoxystrobin	131860-33-8	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Bendiocarb	22781-23-3	0.1	µg/L	----	<0.10	<0.10	----	<0.10
Benomyl	17804-35-2	0.01	µg/L	----	<0.01	<0.01	----	**0.18**
Bensulfuron methyl	83055-99-6	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Bensulide	741-58-2	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Boscalid	188425-85-6	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Brodifacoum	56073-10-0	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Bromacil	314-40-9	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Bromophos-ethyl	4824-78-6	0.1	µg/L	----	<0.10	<0.10	----	<0.10
Bromoxynil	1689-84-5	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Butachlor	23184-66-9	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Carbaryl	63-25-2	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Carbendazim (Thiophanate methyl)	10605-21-7	0.1	µg/L	----	<0.1	<0.1	----	**0.2**

Analytical Results

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

			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP234: Multiresidue Pesticides - Continued								
Carbofenothion	786-19-6	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Carbofuran	1563-66-2	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Carboxin	5234-68-4	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Carfentrazone-ethyl	128639-02-1	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Chlorantraniliprole	500008-45-7	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Chlorfenvinphos	470-90-6	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Chlorothalonil	1897-45-6	2	µg/L	----	<2	<2	----	<2
Chloroxuron	1982-47-4	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Chlorpyrifos	2921-88-2	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Chlorpyrifos-methyl	5598-13-0	0.2	µg/L	----	<0.2	<0.2	----	<0.2
Chlorsulfuron	64902-72-3	0.2	µg/L	----	<0.2	<0.2	----	<0.2
Coumaphos	56-72-4	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Cyanazine	21725-46-2	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Cyproconazole	94361-06-5	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Cyprodinil	121552-61-2	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Cyromazine	66215-27-8	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Demeton-O	298-03-0	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Demeton-O & Demeton-S	298-03-3/126-75-0	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Demeton-S	126-75-0	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Demeton-S-methyl	919-86-8	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Diazinon	333-41-5	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Dichlobenil	1194-65-6	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Dichlorprop-P	15165-67-0	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Dichlorvos	62-73-7	0.2	µg/L	----	<0.20	<0.20	----	<0.20
Diclofop-methyl	51338-27-3	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Dicofol	115-32-2	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Difenoconazole	119446-68-3	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Diflubenzuron	35367-38-5	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Diflufenican	83164-33-4	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Dimethoate	60-51-5	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Diphenamid	957-51-7	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Disulfoton	298-04-4	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Diuron	330-54-1	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Endothal	145-73-3	1	µg/L	----	<1.0	<1.0	----	<1.0
EPN	2104-64-5	0.05	µg/L	----	<0.05	<0.05	----	<0.05

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP234: Multiresidue Pesticides - Continued								
EPTC	759-94-4	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Ethion	563-12-2	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Ethoprophos	13194-48-4	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Etridiazole	2593-15-9	0.5	µg/L	----	<0.5	<0.5	----	<0.5
Fenamiphos	22224-92-6	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Fenarimol	60168-88-9	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Fenchlorphos (Ronnel)	299-84-3	10	µg/L	----	<10	<10	----	<10
Fenitrothion	122-14-5	2	µg/L	----	<2	<2	----	<2
Fenoxycarb	79127-80-3	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Fensulfothion	115-90-2	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Fenthion	55-38-9	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Fipronil	120068-37-3	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Flamprop methyl	52756-25-9	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Fluometuron	2164-17-2	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Flupropanate	756-09-2	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Flusilazole	85509-19-9	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Formothion	2540-82-1	20	µg/L	----	<20	<20	----	<20
Fosetyl Aluminium	39148-24-8	10	µg/L	----	<10	<10	----	<10
Haloxyfop	69806-34-4	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Hexaconazole	79983-71-4	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Hexaflurate	17029-22-0	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Hexazinone	51235-04-2	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Imazapyr	94795-74-1	10	µg/L	----	<10.0	<10.0	----	<10.0
Indoxacarb	173584-44-6	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Iodosulfuron methyl	144550-36-7	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Iprodione	36734-19-7	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Irgarol	28159-98-0	0.002	µg/L	----	<0.002	<0.002	----	<0.002
Isoproturon	34123-59-6	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Malathion	121-75-5	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Metalaxyl	57837-19-1	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Metalaxyl-M	70630-17-0	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Metaldehyde	108-62-3	10	µg/L	----	<10	<10	----	<10
Methidathion	950-37-8	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Methiocarb	2032-65-7	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Methomyl	16752-77-5	0.01	µg/L	----	<0.01	<0.01	----	<0.01

Analytical Results

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

			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	CAS Number	LOR	Unit	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP234: Multiresidue Pesticides - Continued								
Metolachlor	51218-45-2	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Metribuzin	21087-64-9	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Mevinphos	7786-34-7	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Molinate	2212-67-1	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Monocrotophos	6923-22-4	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Naftalofos	1491-41-4	1	µg/L	----	<1.0	<1.0	----	<1.0
Napropamide	15299-99-7	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Nicarbazin	399-95-0	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Nitralin	4726-14-1	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Norflurazon	27314-13-2	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Myclobutanil	88671-89-0	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Novaluron	116714-46-6	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Omethoate	1113-02-6	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Oryzalin	19044-88-3	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Oxamyl	23135-22-0	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Oxyfluorfen	42874-03-3	1	µg/L	----	<1.0	<1.0	----	<1.0
Paclobutrazole	76738-62-0	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Parathion	56-38-2	0.2	µg/L	----	<0.2	<0.2	----	<0.2
Parathion-methyl	298-00-0	2	µg/L	----	<2.0	<2.0	----	<2.0
Pebulate	1114-71-2	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Penconazole	66246-88-6	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Pendimethalin	40487-42-1	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Phorate	298-02-2	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Pirimicarb	23103-98-2	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Pirimiphos-ethyl	23505-41-1	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Pirimiphos-methyl	29232-93-7	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Prochloraz	67747-09-5	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Profenofos	41198-08-7	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Prometryn	7287-19-6	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Propachlor	1918-16-7	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Promecarb	2631-37-0	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Propamocarb	24579-73-5	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Propanil	709-98-8	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Propargite	2312-35-8	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Propazine	139-40-2	0.01	µg/L	----	<0.01	<0.01	----	<0.01

Analytical Results

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

			Client sample ID	MW01	MW02	MW03	MW04	Basin 2
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	CAS Number	LOR	Unit	ES1703849-001	ES1703849-002	ES1703849-003	ES1703849-004	ES1703849-005
				Result	Result	Result	Result	Result
EP234: Multiresidue Pesticides - Continued								
Propiconazole	60207-90-1	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Propyzamide	23950-58-5	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Prothiofos	34643-46-4	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Pyraclostrobin	175013-18-0	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Pyrasulfatole	365400-11-9	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Pyrazophos	13457-18-6	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Pyrimethanil	53112-28-0	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Pyriproxyfen	95737-68-1	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Pyroxsulam	422556-08-9	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Quinclorac	84087-01-4	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Rimsulfuron	122931-48-0	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Siduron	1982-49-6	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Simazine	122-34-9	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Spirotetramat	203313-25-1	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Sulfotep	3689-24-5	0.005	µg/L	----	<0.005	<0.005	----	<0.005
Sulprofos	35400-43-2	0.05	µg/L	----	<0.05	<0.05	----	<0.05
Tebuconazole	107534-96-3	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Tebuthiuron	34014-18-1	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Temephos	3383-96-8	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Terbacil	5902-51-2	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Terbufos	13071-79-9	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Terbuthylazine	5915-41-3	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Terbutryn	886-50-0	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Tetrachlorvinphos	22248-79-9	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Tetraconazole	112281-77-3	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Thiamethoxam	153719-23-4	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Thiobencarb	28249-77-6	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Thiodicarb	59669-26-0	0.01	µg/L	----	<0.01	<0.01	----	<0.01
Thiometon	640-15-3	0.5	µg/L	----	<0.5	<0.5	----	<0.5
Toltrazuril	69004-03-1	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Triadimefon	43121-43-3	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Triadimenol	55219-65-3	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Triazophos	24017-47-8	0.005	µg/L	----	<0.005	<0.005	----	<0.005
Trichlorfon	52-68-6	0.02	µg/L	----	<0.02	<0.02	----	<0.02
Trichloronate	327-98-0	0.5	µg/L	----	<0.5	<0.5	----	<0.5

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	CAS Number	LOR	Unit	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP234: Multiresidue Pesticides - Continued								
Trifloxystrobin	141517-21-7	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Trifloxysulfuron-sodium	199119-58-9	0.1	µg/L	----	<0.1	<0.1	----	<0.1
Trifluralin	1582-09-8	10	µg/L	----	<10.0	<10.0	----	<10.0
Trinexapac Ethyl	95266-40-3	1	µg/L	----	<1	<1	----	<1
Vernolate	1929-77-7	0.1	µg/L	----	<0.1	<0.1	----	<0.1
EP247: Phenolics and Related Compounds								
2,4-Dinitrophenol	51-28-5	0.01	µg/L	----	<0.01	<0.01	----	<0.01
2-Methyl-4.6-dinitrophenol	8071-51-0	0.05	µg/L	----	<0.05	<0.05	----	<0.05
4-Nonylphenol (mixture of isomers)	84852-15-3	0.1	µg/L	----	<0.10	<0.10	----	<0.10
Hexachlorophene	70-30-4	0.1	µg/L	----	<0.10	<0.10	----	<0.10
4-Nitrophenol	100-02-7	0.1	µg/L	----	<0.10	<0.10	----	**0.13**
4-Chloro-3-methylphenol	59-50-7	0.1	µg/L	----	<0.10	<0.10	----	<0.10
Pentachlorophenol	87-86-5	0.1	µg/L	----	<0.10	<0.10	----	**0.13**
Dinoseb	88-85-7	0.1	µg/L	----	<0.10	<0.10	----	<0.10
Dalapon	75-99-0	0.1	µg/L	----	<0.10	<0.10	----	<0.10
Bisphenol-A	80-05-7	0.05	µg/L	----	**0.40**	**1.28**	----	**0.22**
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	5	%	----	**102**	**110**	----	**112**
Toluene-D8	2037-26-5	5	%	----	**95.4**	**103**	----	**101**
4-Bromofluorobenzene	460-00-4	5	%	----	**87.7**	**97.9**	----	**95.8**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	**23.0**	**19.1**	**21.3**	**21.7**	**18.2**
2-Chlorophenol-D4	93951-73-6	1	%	**50.4**	**43.5**	**50.2**	**51.8**	**36.2**
2.4.6-Tribromophenol	118-79-6	1	%	**66.3**	**65.6**	**74.8**	**69.4**	**39.9**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	**81.0**	**73.1**	**86.6**	**82.1**	**80.6**
Anthracene-d10	1719-06-8	1	%	**94.4**	**76.1**	**77.0**	**96.8**	**89.6**
4-Terphenyl-d14	1718-51-0	1	%	**81.9**	**67.9**	**89.7**	**87.8**	**84.6**
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	2	%	----	**40.3**	**46.6**	----	**23.8**
Phenol-d6	13127-88-3	2	%	----	**30.8**	**35.0**	----	**28.4**
2-Chlorophenol-D4	93951-73-6	2	%	----	**54.9**	**63.4**	----	**43.8**
2.4.6-Tribromophenol	118-79-6	2	%	----	**61.3**	**71.4**	----	**36.6**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**MW01**	**MW02**	**MW03**	**MW04**	**Basin 2**
			Client sampling date / time	17-Feb-2017 13:15	17-Feb-2017 10:00	17-Feb-2017 11:15	17-Feb-2017 08:45	17-Feb-2017 10:30
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-001**	**ES1703849-002**	**ES1703849-003**	**ES1703849-004**	**ES1703849-005**
				Result	Result	Result	Result	Result
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	2	%	----	**62.8**	**71.4**	----	**62.7**
1.2-Dichlorobenzene-D4	2199-69-1	2	%	----	**59.7**	**67.8**	----	**59.2**
2-Fluorobiphenyl	321-60-8	2	%	----	**69.2**	**79.0**	----	**72.8**
Anthracene-d10	1719-06-8	2	%	----	**78.0**	**88.8**	----	**82.5**
4-Terphenyl-d14	1718-51-0	2	%	----	**61.4**	**73.9**	----	**67.7**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**110**	**105**	**114**	**116**	**116**
Toluene-D8	2037-26-5	2	%	**94.7**	**90.4**	**97.2**	**100**	**95.6**
4-Bromofluorobenzene	460-00-4	2	%	**100**	**91.8**	**102**	**105**	**100**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Water Leak**	**----**	**----**	**----**	**----**
			Client sampling date / time	17-Feb-2017 11:40	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-006**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**489**	----	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	**330**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**22**	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**112**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**112**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**46**	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**42**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**51**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	**5**	----	----	----	----
Sodium	7440-23-5	1	mg/L	**32**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**8**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.03**	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L	**0.002**	----	----	----	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	----	----	----	----
Barium	7440-39-3	0.001	mg/L	**0.034**	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	**0.003**	----	----	----	----
Gallium	7440-55-3	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Manganese	7439-96-5	0.001	mg/L	**0.017**	----	----	----	----
Molybdenum	7439-98-7	0.001	mg/L	**0.015**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	**0.001**	----	----	----	----
Vanadium	7440-62-2	0.01	mg/L	**0.02**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Water Leak**	**----**	**----**	**----**	**----**
			Client sampling date / time	17-Feb-2017 11:40	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-006**	--------	--------	--------	--------
				Result	----	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Zinc	7440-66-6	0.005	mg/L	**0.005**	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	----	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.8**	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.14**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	**0.03**	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.05**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.08**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**1.4**	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**1.5**	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.08**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	**0.02**	----	----	----	----
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	**4.38**	----	----	----	----
Total Cations	----	0.01	meq/L	**4.55**	----	----	----	----
Ionic Balance	----	0.01	%	**1.93**	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1	µg/L	<1.0	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**Water Leak**	----	----	----	----
			Client sampling date / time	17-Feb-2017 11:40	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1703849-006**	--------	--------	--------	--------
				Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Anthracene	120-12-7	1	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	**140**	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	**140**	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	**140**	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	**140**	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**Water Leak**	----	----	----	----
			Client sampling date / time	17-Feb-2017 11:40	----	----	----	----
Compound	CAS Number	LOR	Unit	**ES1703849-006**	--------	--------	--------	--------
				Result	----	----	----	----
EP080: BTEXN - Continued								
^ **Total Xylenes**	1330-20-7	2	µg/L	<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	**21.1**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%	**47.8**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%	**73.7**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	**86.8**	----	----	----	----
Anthracene-d10	1719-06-8	1	%	**84.6**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1	%	**87.4**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**117**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**100**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**104**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	*CAS Number*	*Recovery Limits (%)* Low	*Recovery Limits (%)* High
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	78	133
Toluene-D8	2037-26-5	79	129
4-Bromofluorobenzene	460-00-4	81	124
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	10	117
Phenol-d6	13127-88-3	10	69
2-Chlorophenol-D4	93951-73-6	21	130
2.4.6-Tribromophenol	118-79-6	10	151
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	29	142
1.2-Dichlorobenzene-D4	2199-69-1	24	121
2-Fluorobiphenyl	321-60-8	27	135
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	21	123
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

Appendix N

Pollution Reduction Program Update