CONSTRUCITON ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

Kyeemagh Public School

Jacobson Avenue & Beehag Street,
Kyeemagh NSW 2216

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E-PLAN-03 (September 2020) | Approved by Andrew Andreou
Uncontrolled copy once printed

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TAYLOR

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1. INTRODUCTION

1.1 PROJECT INFORMATION TABLE

Project information table	
Project name	Kyeemagh Public School
Location	Jacobson Avenue & Beehag Street, Kyeemagh NSW 2216
Client	NSW Department of Education
Duration of contract	80 weeks

Taylor contact information	
Company name	Taylor Construction Group Pty Ltd
ABN	25 067 428 344
Address	Level 13, 157 Walker Street, North Sydney 2060
Telephone and fax	Ph.: 02 8736 9000 Fax: 02 8736 9090

Position	Contact name	Phone numbers
Chief Operating Officer	Clive Wickham	02 8736 9000
General Manager	Tim Christie	02 8736 9000
Construction Manager	Doug Woods	0414 939 854
Sr Project Manager	Steve Ziaziaris	0413 182 641
Site Manager (24 Hour Contact)	David Pereira	0415 241 170
HSE Manager	Andrew Andreou	0404 492 614
Safety Advisor	TBC	TBC
Quality Manager	Stephen Player	02 8736 9000
Contract Administrator	Scott Dobson	0414 984 567
Site Engineer	Shanil Prasad	0432 870 855
Foreman/ leading hand	TBC	TBC
Cadet	Kurt Dessmann / Daniel Taylor	0431 205 832 / 0458 476 555

Document control	Name	Position	Signature	Date
Prepared by	Shanil Prasad	Project Coordinator		29.09.2020
Reviewed by:	Steve Ziaziaris	Sr Project Manager		29.09.2020
Reviewed by:				

Revised by	Revision #	Date	Changes made
Shanil Prasad	Draft	17.07.20	Initial Draft
Shanil Prasad	1	30.07.20	Revised as per comments
Shanil Prasad	2	31.07.20	Revised as per conditions table
Shanil Prasad	3	17.09.20	Revised as per wolfpeak comments
Shanil Prasad	4	29.09.20	Revised as per additional wolfpeak comments

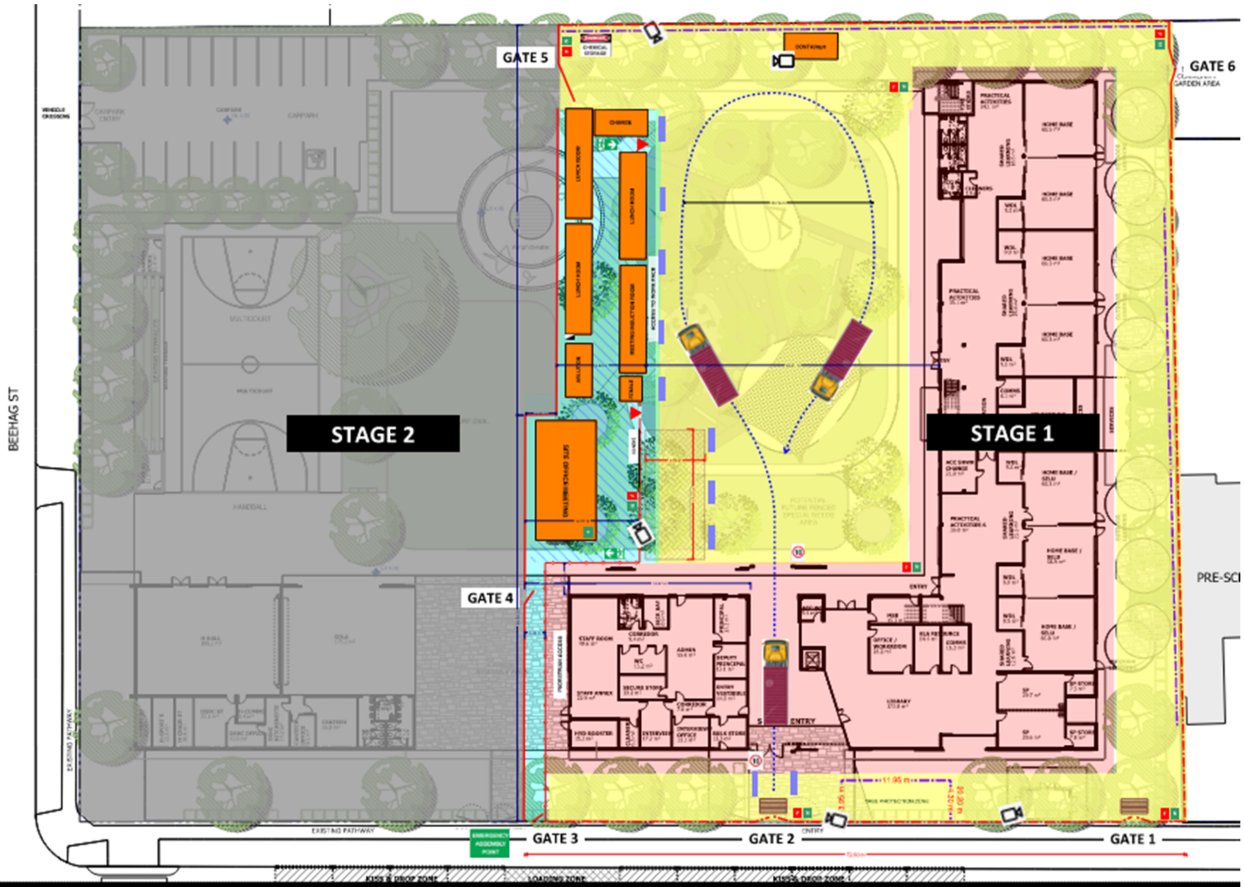
1.2 PROJECT DESCRIPTION

Kyeemagh is currently a K-2 Infant School and accommodates 61 students in 3 teaching spaces and will be demolished and replaced by a new K-6 school with 14 home bases, 3 special needs rooms and 2 special program rooms to accommodate 500 students. The new project includes new core 14 Facilities (Administration, COLA, Hall, and Library) together with 20 additional car parking spaces and a community garden.

The project will be constructed in two stages consisting of:

Stage 1 – Main Building New 2 storey teaching spaces and associated amenities; New Library; New administration Building; New playing space and Landscaping

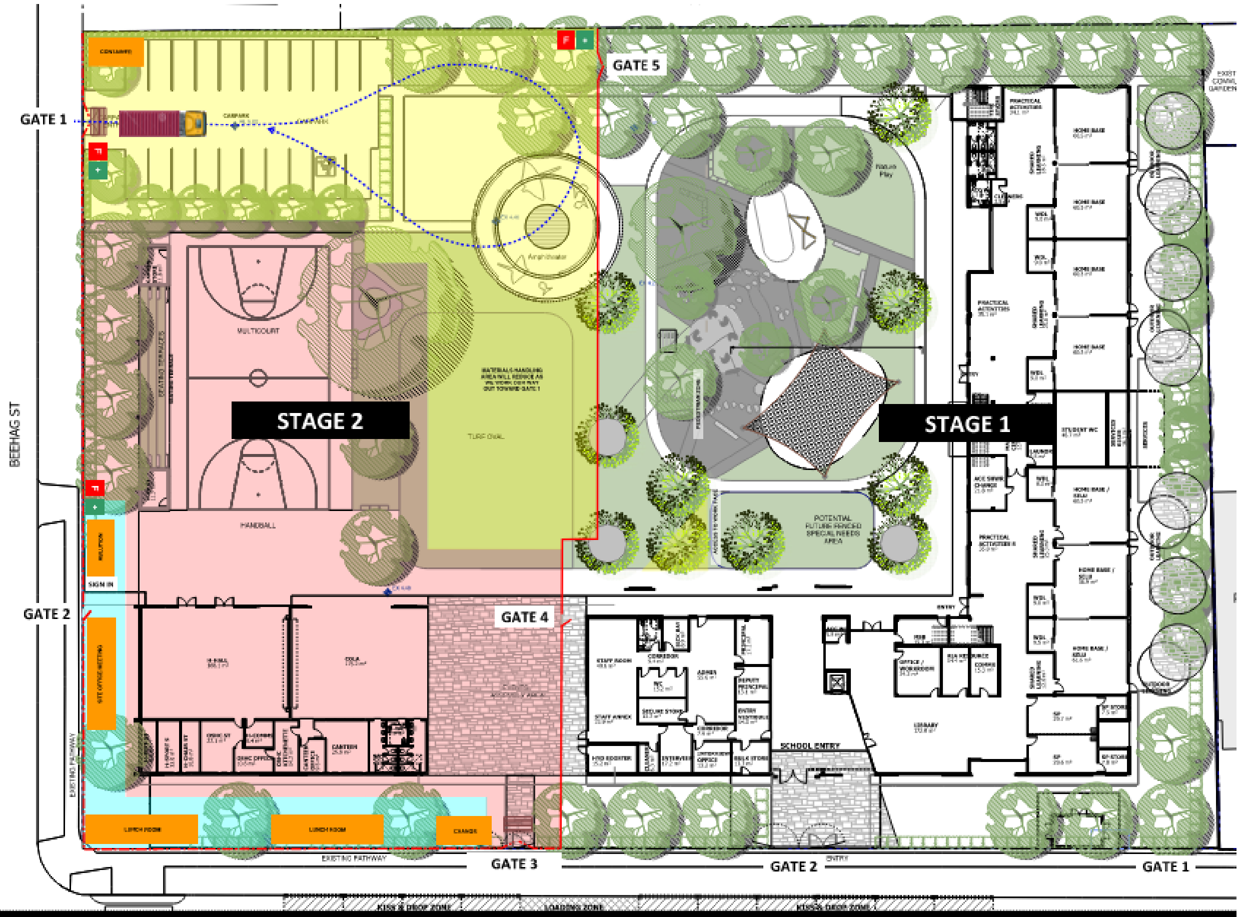
Stage 2 – Demolition of all existing buildings; New COLA, New Hall, Car parking; New Multicourt playing space with Tiered Seating and landscaping.



SITE PLAN - STAGE 1

Rev 6 09/09/2020

Kyeemagh Public School



SITE PLAN - STAGE 2

Rev 0

Kyeemagh Public School

1.3 PURPOSE OF THE PROJECT ENVIRONMENTAL MANAGEMENT PLAN

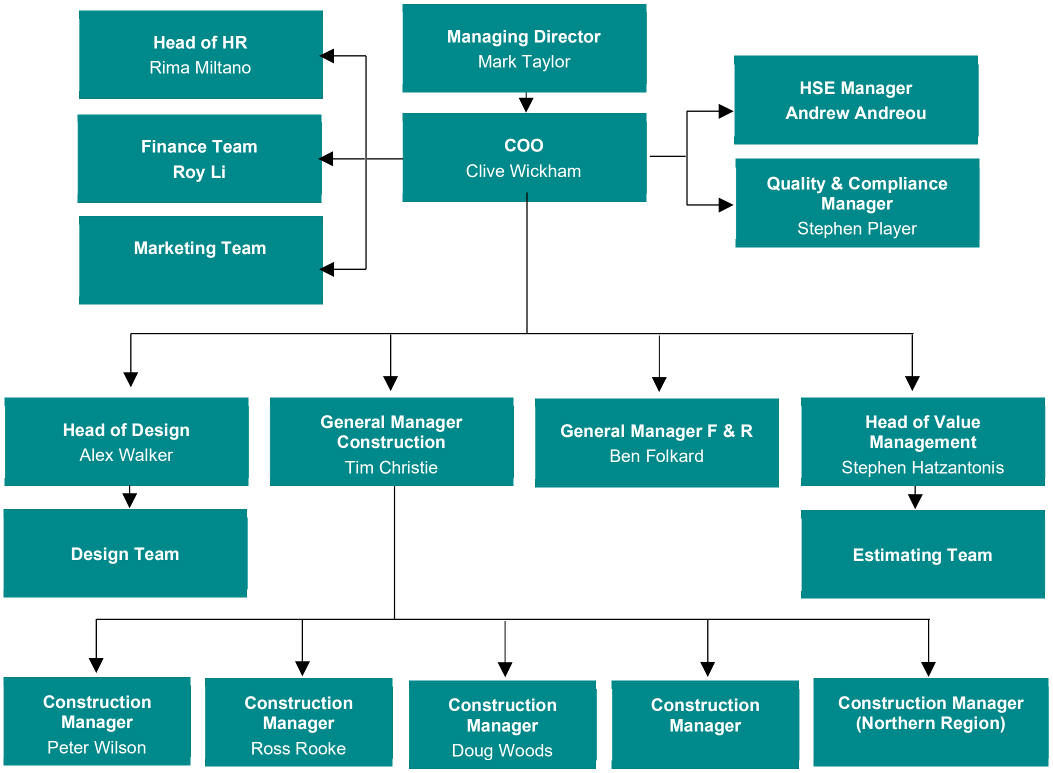
Taylor Construction Group Pty Ltd has a documented Quality, Health, Safety and Environmental (QSE) Management System. While the management systems are integrated, key documents such as the Project Environmental Management Plan (PEMP), the Project Safety Plan (WHSP) and the Project Management Plan (PMP, overarching plan with Quality provisions) are developed as separate documents to give each area a strong individual focus. The ‘hierarchy of system documents’ diagram below provides an overview of where the PEMP fits in the management system hierarchy.

This document is a key component of the integrated QSE Management System and sets out the environmental management strategy to be adopted on site by Taylor Construction Group Pty Ltd as the principal contractor for works undertaken on this project. The purpose of this document is to provide guidance on the essential environmental requirements on a project level and reference to other important management system processes and procedures. A Project Environmental Management Plan must be prepared for each project managed by Taylor Construction Group.

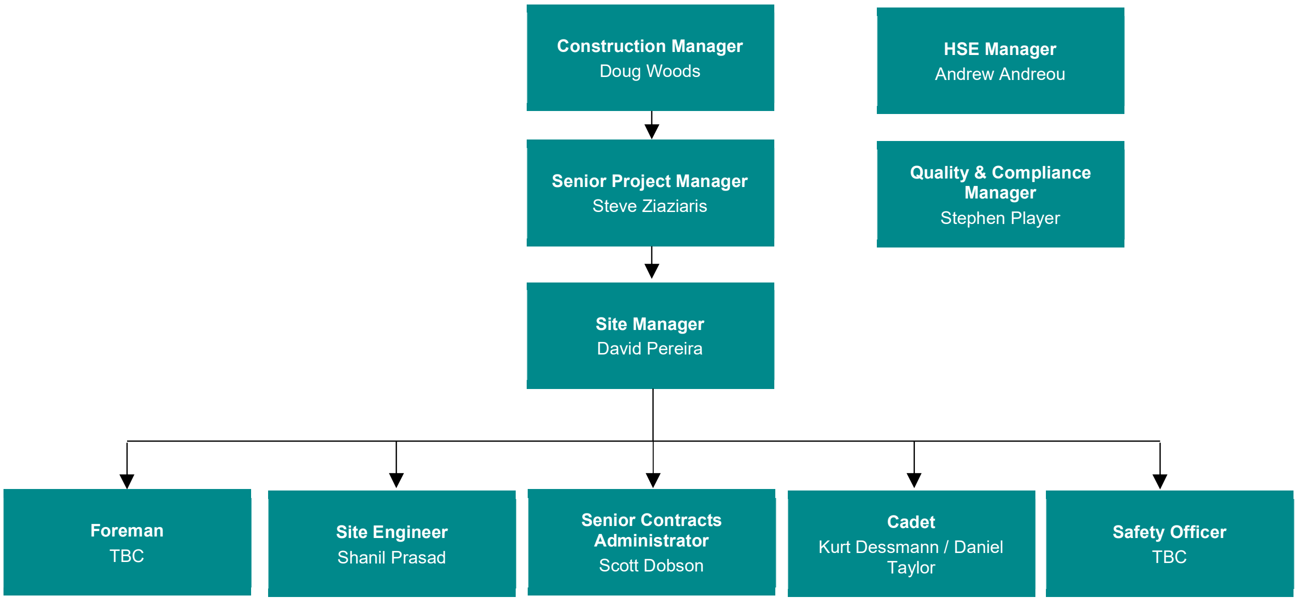
The project-specific Environmental Management Plan is to be read in accordance with Taylor Construction Management Manual, Site Management Plan and Site Safety Plan.

1.4 ORGANISATIONAL CHART

Corporate Team



Project Team



2. HIERARCHY OF HSE SYSTEM DOCUMENTS

3. ENVIROMENTAL POLICY

Taylor Construction Group has an Environmental Policy outlining our commitment to protection of the environment. This policy can be found in Appendix 2 of this document. A copy of the Environmental Policy is to be posted on the walls or notice board at the project site.

4. LEGAL AND OTHER REQUIREMENTS

The processes for identifying and keeping up to date with legal and other requirements are outlined in the **Legal and Other Requirements Procedure SE-P-01**.

An **Environmental Legal and Other Requirements Register E-R-01** has been prepared and is periodically updated to ensure that it reflects current legal requirements. This register identifies the key relevant legislation and guidelines and should be attached to this plan in appendix 7.

4.1 ENVIRONMENTAL FACTORS

Factor	Objectives	Requirements
Noise management*		
Noise/ vibration	Protect the amenity of nearby residents from noise/ vibration impacts resulting from activities associated with the proposed or existing development by ensuring that noise/ vibration levels meet statutory requirements and acceptable standards.	Identification of sources of noise/ vibration and estimates of project-wide noise. Ensure that noise and vibration levels meet acceptable standards and that an adequate level of service, safety and public amenity is maintained. Propose measures to manage and/ or mitigate impacts.

Water management*		
Surface water quality	Maintain or improve the quality of surface water to ensure that existing and potential uses, including ecosystem maintenance, are protected.	Details of site drainage, hydrocarbon use, disposal of plant site waste (including sewage), dewatering, and fate of water used/ pumped. Incorporate measures and/ or operating procedures to ensure that storm water run-off from the site reflects patterns, volumes and quality that exist prior to development, as far as reasonably practicable. Drainage lines are to be naturalised as much as possible and should enhance the ecological values and recreational opportunities. Propose measures to manage and/ or mitigate impacts.
Groundwater quality	Maintain or improve the quality of groundwater to ensure that existing and potential uses, including ecosystem maintenance, are protected.	Describe water requirements for any on-site processing. Incorporate measures and/ or operating procedures that will minimise the demand of the development on potable water supplies. Ensure that no contaminated water, including that containing sediments, leaves the site. Propose measures to manage and/ or mitigate impacts.
Air management		
Air	Ensure that potential air pollutants are contained and that activities do not impact on the natural environment.	Identify sources of air pollution. Propose measures to manage and/ or mitigate impacts.
Particulates/ dust	Ensure that particulate/ dust emissions, both individually and cumulatively, meet appropriate criteria and do not cause an environmental or human health problem.	Identification of sources of particulates/ dust and estimates of project-wide emissions. Propose measures to manage and/ or mitigate impacts.
Odour	Ensure that operations do not generate odour that causes environmental nuisance.	Identification of sources of odour and estimates of project-wide emissions. Propose measures to manage and/ or mitigate impacts.
Waste management		
Solid/ liquid waste	Ensure that wastes are contained and isolated from land, ground and surface water surrounds and treatment or collection does not result in long-term impacts on the natural environment.	Identify sources of solid and liquid waste and estimate the proposed amount generated. Propose measures to manage and/ or mitigate impacts.
Contaminated land and water		
Land	Ensure that existing or proposed activities do not discharge to land.	Identify activities that have the potential to discharge to land. Propose measures to manage and/ or mitigate impacts.

Surface water	Ensure that existing or proposed activities do not discharge to surface waters.	Identify activities that have the potential to discharge to surface waters. Propose measures to manage and/ or mitigate impacts.
Groundwater	Ensure that existing or proposed activities do not discharge to groundwater.	Identify activities that have the potential to discharge to groundwater. Propose measures to manage and/ or mitigate impacts
Hazardous materials management		
Scheduled wastes	Ensure scheduled wastes are specially treated for their destruction.	Identify scheduled wastes and describe treatment of their destruction. Propose measures to manage and/ or mitigate impacts.
Resource storage	Ensure that chemicals and other potentially harmful resources used in the manufacturing process are stored and disposed of correctly.	Describe the use and management of chemicals and other potentially harmful resources. Propose measures to manage and/ or mitigate impacts.
Compressed/ liquid gas	Ensure the suitable storage of compressed/ liquid gas.	Describe the use and management of compressed/ liquid gas. Propose measures to manage and/ or mitigate impacts.

4.2 SPECIFIC UNDERTAKING FROM FORMAL ENVIRONMENTAL IMPACT ASSESSMENT

- Requirements required within the Project Remediation Action Plan (Ref: 80818157_R002_Kyeemaghl nfants_RAP_Rev0)
- Requirements required by the Conditions of Development Consent for State Significant Development Application No SSD Project 9391

4.3 DEVELOPMENT CONSENT CONDITIONS

Consent working hours are:

Monday to Friday	7.00 am	6.00 pm
Saturdays	8.00 am	1.00 pm
Sundays and public holidays	NO WORK	

Works may be undertaken outside these hours in accordance with conditions C4 where:

- by the Police or a Public Authority for the delivery of vehicles, plant, or materials; or
- in an emergency to avoid the loss of life, damage to property or to prevent environment harem; or
- where the works are inaudible at the nearest sensitive receivers; or
- where a variation is approved in advance in writing by the Planning Secretary or his nominee if appropriate justification is provided for the works.

Rock breaking, rock hammering, sheet piling, pile driving, and similar activities may only be carried out between the following hours:

- Monday to Friday 9.00 am to 12.00 pm
- Monday to Friday 2.00 am to 5.00 pm
- Saturdays 9.00 am to 12.00 pm.

4.4 DEVELOPMENT CONSENT CONDITIONS

Condition	Description	Page Number
B13	**CEMP Requirements**	
B13	(a)Details of: (i)hours of work; (ii)24-hour contact details of site manager;	(i)Section 4.3 Page 10 (ii) Project Information Table Page 4
B13	(a)Details of: (iii)management of dust and odour to protect the amenity of the neighbourhood;	Section 4.1 Page 9 Section 11.3.7 Page 32 Section 11.3.10 Page 34
B13	(a)Details of: (iv)stormwater control and discharge;	Section 11.3 Page 29 & 30 Appendix 11 CSWMSP
B13	(a)Details of: (v)measures to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site;	Section 11.3.2 Page 29 & 30 Appendix 11 Section 6 CSWMSP
B13	(a)Details of: (vi)groundwater management plan including measures to prevent groundwater contamination;	Section 11.3.6 Page 32 Appendix 6 Page 6 Appendix 11 CSWMSP
B13	Air Quality Management	Section 11.3.7 Page 32 & 33
B13	(a)Details of: (vii)external lighting in compliance with AS 4282-2019 Control of the obtrusive effects of outdoor lighting;	Section 11.3.14 Page 35
B13	(a)Details of: (viii)community consultation and complaints handling;	Section 10.2 Page 28
B13	(b)Construction Traffic and Pedestrian Management Sub-Plan (see condition B23);	Appendix 8
B13	(c)Construction Noise and Vibration Management Sub-Plan (see condition B24);	Appendix 9
B13	(d)Construction Waste Management Sub-Plan (see condition B25);	Appendix 10
B13	(e)Construction Soil and Water Management Sub-Plan (see condition B26);	Appendix 11
B13	(f) Flood Emergency Response Sub-Plan (see condition B18);	Appendix 14
B13	(f)an unexpected finds protocol for contamination and associated communications procedure as required by condition B18;	Section 12.3 Page 36 Appendix 12 RAP AMP
B13	(g)an unexpected finds protocol for Aboriginal and non-Aboriginal heritage and associated communications procedure; and	Section 11.3.13 Page 34 & 35
B13	(h)waste classification (for materials to be removed) and validation (for materials to remain) be undertaken to confirm the contamination status in these areas of the site.	Appendix 10 CWMP

Condition	Description	Page Number
B17	Erosion & Settlement Control Installation Prior to the commencement of construction, the Applicant must install erosion and sediment controls on the site to manage wet weather events.	Appendix 11 CSWMSP
B17	Erosion & Settlement Control Installation Prior to the commencement of construction, erosion and sediment controls must be installed and maintained, as a minimum, in accordance with the publication Managing Urban Stormwater: Soils & Construction (4th edition, Landcom 2004) commonly referred to as the ‘Blue Book’.	Appendix 11 CSWMSP

5. ENVIRONMENTAL RISK IDENTIFICATION AND ASSESSMENT

Standard ISO 14001 requires that environmental aspects relating to the organisation's activities, products and services are identified and those aspects that can have a significant impact on the environment, determined. At Taylor Construction Group, the environmental aspects relating to general construction activities have been identified through a risk assessment workshop attended by key project and site managers and an environmental consultant. The aspects, impacts, risk assessment outcomes and generic controls are documented in the **HSE Risk Register HSE-R-01**. Detailed requirements for risk assessments (environmental and OHS) are described in **Risk Assessment Procedure SE-OP-03.**

5.1 ENVIRONMENTAL RISK ASSESSMENT

The methodology for risk assessments are based on the requirements described AS/NZS 4360 (Risk Assessment) and HB203 (Environmental Risk Assessment).

Taylor Construction procedure requires an initial Project Risk Assessment to be undertaken at the commencement of each project. The Risk Assessment is to be conducted in the form of a workshop and is to include the project/ site manager, HSE manager, key members of the project team and, to the extent required, key subcontractors, and is to be recorded on form **HSE-R-01 HSE Risk Register**.

The HSE Risk Register is to be developed to address both legal and other requirements covered in this plan and is to be referenced to implement systems and work practices that will eliminate or minimize the likelihood of injury, illness or incident occurring.

When developing the Project HSE Risk Register, members of the workshop will to take into consideration available information which is relevant to the works and is contained in any published copies of the HSE Acts; WHS regulation; Australian/ National Standards; codes of practice; available internal and external industry bulletins/ alerts and industry reports to identify and document any known or foreseeable hazards associated with that tasks.

The completed Environmental Risk Assessment can be found in Appendix 13 of the project HSE Plan (**WHS-PLAN-02**).

References:

- SE-P-03 Risk Assessment Procedure

6. OBJECTIVES AND TARGETS

Objectives and targets are set at a corporate level. They are monitored and measured to ensure that Taylor Construction Group continually improves our environmental performance. To ensure that we meet our corporate objectives and targets, key performance indicators (KPIs) are set at a project level and reported to management monthly.

Objectives	Targets
Effective site environmental controls.	Achieve alignment with Taylors and Client expectations in relation to best practice control measures. Fulfil environmental obligations.
Increase amount of waste being recycled, reduce waste cost.	Eighty-five per cent (85%) of waste to be recycled.
Environmental performance.	Zero major environmental incidents and no breaches. Zero infringement notices. All environmental spills to be reported to Taylor Construction within 2 hours of occurrence. Environmental inspection competed weekly and documented in **SE-F-02 HSE Inspection Checklist** (more often if required).
Reduce the amount of environmental impact our operations have on the environment.	Environmental issues identified and controlled prior to causing negative impacts on the project or on the environment.
Effective implementation of the environmental system.	Eighty per cent (80%) or better internal audit results. Full compliance with planning approval requirements.
Community issues carefully handled.	Zero valid complaints. All complaints reported to Taylor's representative.

7. ROLES AND RESPONSIBILITIES

All persons working for and on behalf of Taylor Construction Group have responsibilities in relation to ensuring that environmental issues are appropriately managed. Generic WHS and environmental responsibilities are outlined in the **Roles, Responsibilities and Authorities Procedure QSE-P-06.**

Subcontractors. The subcontractor shall be required to comply with all applicable work health, safety and environmental legislation, including any additional Taylor's requirements, whilst engaged on a Taylor-managed project. The subcontractor shall be responsible to communicate any relevant environmental information to their personnel (workers) who are engaged in carrying out the work or providing material to the job site, including any secondary subcontractors or sole traders engaged by them and approved by Taylor Construction.

Subcontractor's minimal environmental requirements:

- Has the subcontractor identified in the SWMS environmental hazards and controls in relation to the work task (where required), i.e. refuelling plant and equipment on site, nuisance dust controls, nuisance noise, waste management (off-cuts), rubbish, concrete wash-out?
- Have hazardous substances or dangerous goods to be used on site by the subcontractor been identified? **Note:** the subcontractor will need to provide copies of relevant Safety Data Sheets (SDS) for all materials and/ or hazardous substances or dangerous goods to be used on site and note reference to training of employees in the SDS prior to first use and controls listed in the SWMS.

Taylor Construction personnel. For this project, the key roles and specific responsibilities of our managers, supervisors and site personnel regarding environmental management on site are outlined below. Project-related management and staff are required to sign off that they have read and understood their responsibilities once the plan has been approved for the project.

7.1 CHIEF OPERATING OFFICER

The chief operating officer is responsible for:

- Defining Taylor Construction workplace health and safety policies and setting their objectives;
- Providing leadership that promotes and maintains Taylor's determination to continually improve its performance in workplace health and safety;
- Demonstrating genuine interest in workplace health and safety; supporting all project managers to encourage incident prevention;
- Acquiring and keeping up-to-date knowledge of workplace health and safety matters;
- Gaining an understanding of the operations of the business and the hazards and risks involved;
- Ensuring information regarding incidents, hazards and risks is received responded to in a timely way;
- Ensuring the PCBU has, and implements, processes for complying with any legal duty or obligation;
- Being fully briefed of the safety status of all current Taylor Construction projects;
- Setting targets and allocating priorities for workplace health and safety matters for all Taylor Construction staff;
- Leading by example in all matters concerning workplace health and safety.

Name: Clive Wickham

Signed: **Date:**

7.2 GENERAL MANAGER

The general manager is responsible for:

- Demonstrating genuine interest in workplace health and safety; supporting all project and site managers to encourage incident prevention;
- Assessing and allocating appropriate resources and equipment within the company for the effective implementation of the Workplace Health and Safety Management System and the management of WHS related hazard/ risks relevant to the construction projects;
- Being fully briefed of the HSE status of all current Taylor Construction projects;
- Assisting in the development and implementation of continuous improvement processes for workplace health and safety.

Specific roles:

- Provide visible commitment to a safe and healthy work environment by ensuring regular reviews are undertaken. Participate in health and safety meetings and consultation regarding workplace health and safety matters;
- Consider workplace health and safety matters with other senior members of the organisation as part of normal business practice and incorporate WHS into meeting agendas;
- Allow appropriate budget allocations for HSE management and improvement;
- Encourage and promote safety within the company by participating and openly consulting with employees in respect to their health and safety.

Name: Tim Christie

Signed: **Date:**

7.3 CONSTRUCTION MANAGER

The construction manager is responsible for:

- Demonstrating genuine interest in workplace health and safety; supporting all the project/ site managers to encourage incident prevention;
- Assessing and allocating appropriate resources and equipment within the company for the effective implementation of the workplace health and safety management system and the management of WHS related hazard/ risks relevant to the construction projects;
- Assisting in the development and implementation of continuous improvement processes for workplace health and safety;
- Checking that legislative obligations are met, and that Taylor Construction OHS Policy is effectively implemented throughout all company construction projects;
- Ensuring compliance with Taylor Construction accredited HSE systems is maintained and implemented across all Taylor managed projects.

Specific roles:

- Provide leadership in the development of project teams to ensure the fostering of the business culture and approach to doing business with our clients, consultants and subcontractors;
- Attend sites on a regular basis to ensure compliance with workplace health, safety, quality and programming requirements of both the head contract and the company' systems;
- Provide visible commitment to a safe and healthy work environment by ensuring regular reviews are undertaken, and by participating in safety and health meetings and consultation regarding WHS matters;
- Encourage and promote safety within the company by participating and openly consulting with employees in respect to their health and safety;
- Assist the HSE manager in allocating competent personnel to coordinate workplace health and safety within the company;
- Ensure that project/ site managers have developed and implemented systems, which will ensure subcontractors/ suppliers engaged by the company comply with the health and safety management systems and the relevant WHS legislation;
- Consider workplace health and safety matters with other senior members of the organisation as part of normal business practice and incorporate WHS into meeting agendas;
- Support the HSE manager in ensuring project/ site managers have developed and implemented systems which will ensure subcontractors and suppliers engaged by the company comply with the health and safety management systems and the relevant workplace health and safety legislation;
- Respond to non-conformance by any member of the company who fails to discharge their duties as set by the Responsibility Statement and actively participate in dispute resolution where required;
- Allow appropriate budget allocations for HSE management and improvement;
- Facilitate a systematic approach of workplace health and safety to the identification, assessment, control and monitoring of related risks that may arise through both normal and adverse operating conditions.

Name: Doug Woods

Signed: **Date:**

7.4 PROJECT MANAGERS

The project managers are responsible for:

- Providing visible commitment to a safe and healthy work environment by ensuring regular reviews are undertaken, and by participating in health and safety meetings and consultation regarding WHS matters;
- Consulting with Taylor's construction manager and the HSE manager to ensure enough resources are allocated to the project to comply with legislative and Taylor's HSE requirements;
- Facilitating the process to ensure the project team and the HSE manager are consulted and participate in the development of the project specific HSE Risk Assessment. This is to be done prior to such activities commencing;
- Ensuring compliance with safety legislation, regulations, licensing conditions and authorities requirements relevant to all construction work;
- Ensuring adequate Taylor's site supervision is maintained throughout all hours of operation and those assigned with supervisory roles are competent and authorised to do so (e.g. PM, SM, leading hand or foreman);
- Developing, implementing and reviewing, in consultation with the site manager and HSE manager, the specific site safety plans;
- Identifying, planning and ensuring all safety training required for personnel is undertaken to support project needs, whether on or off-site. This task may be done in liaison with the HSE manager;
- Ensuring provisions are made for having a trained first aider present on site throughout all working hours;
- Ensuring that potential subcontractors have been issued with a copy of the **Contractor's HSE Requirements QSE-F-15.23** (letter template) at tender stage and ensuring, upon successful awarding of contract, that required WHS documents are made available by the subcontractor and reviewed by the project team prior to the subcontractor commencing;
- Supporting the site manager in the management of employee, subcontractor and supplier's performance in complying with Taylor's WHS Plan and the site-specific rules for the project;
- Selecting appropriate subcontractors, giving due regard to their ability to comply with legislative and Taylor's WHS requirements;
- Ensuring incidents are investigated and appropriate action taken as required by Taylor's site Safety Plan requirements in consultation with the HSE manager;
- Ensuring safety Notices issued and/ or visits made to the project by industrial representatives and/ or SafeWork NSW are reported to both managing director and HSE manager;
- Assisting the HSE manager when employees have been injured to evaluate suitable duties and encourage employee's early rehabilitation;
- Developing and implementing site evacuation and emergency procedures and overseeing at least one spontaneous evacuation drill every six months and assessing the results of that drill;
- Demonstrating an attitude to stimulating a high level of safety awareness at all times, leading by example and encouragement with a view to continuous improvement;
- The project manager is required to carry out at least one formal site safety inspection per month on every site under their control;
- Reporting back to Taylor's senior managers the project HSE incidents, external authority visits and/ or Notices issued.
- Ensure that all employees, contractors (and their subcontractors) are made aware of, and are instructed to comply with the, the conditions of this consent relevant to activities they carry out in respect of the development.
- Notification of any incident or non-conformances are provided to the superintendent for notification to the Planning Secretary, within the requirements set out in the SSD.

Name: Steve Ziaziaris

Signed: **Date:**

7.5 HSE MANAGER

The HSE manager is responsible for:

- Overseeing the implementation of Taylor's Health, Safety and Environmental Management System throughout all Taylor Construction activities;
- Ensuring the system is maintained and continuously improved;
- Setting targets and allocating priorities within the framework of the Safety Management System;
- Safeguarding compliance and maintenance of the company's third-party accreditations;
- Planning and delivering training in safety management and/ or arranging for the appropriate internal or external trainers/ facilitators to conduct the training;
- Researching, developing and implementing new procedures and forms, and updating the manual as required;
- Compiling safety data from weekly and monthly project reports;
- Reviewing, analysing and reporting on safety performance to Taylor's managing director, sector managers and any party as arranged by the managing director;
- Ensuring compliance with safety legislation, regulations, licensing conditions and authorities requirements;
- Monitoring construction industry safety technology and management practices;
- Ensuring Taylor's workplace health and safety is reviewed on a regular basis (i.e. arranging for internal and external audits);
- Reviewing internal and external (independent) audit reports and, in consultation with the directors and the project manager, develop appropriate Action Plans if necessary;
- Conducting or delegating internal workplace health and safety audits;
- Workers compensation and return-to-work duties, including notification, recording and first point of contact. These duties may be delegated to appropriate personnel;
- Identifying hazards, assessing risks and selecting risk control measures for site-specific situations;
- When required, acting as the lead investigator in workplace incidents/ accidents, liaise with external authorities in managing them and report back to managing director and/ or sector managers on outcomes of investigations;
- Acquiring and disseminating information associated with construction industry safety;
- Ensuring HSE policies and procedures are implemented on all projects and that a specific site Safety Plan is prepared and implemented for all projects;
- Reviewing all project's health and safety targets; keeping abreast of the changing requirements and techniques;
- At the tender stage, reviewing nominated subcontractor's ability to comply with Taylor's site-specific rules and procedures as well as their own SWMS;
- At the tender stage, ensuring that valid certificates of currency (for workers compensation) are provided by all subcontractors prior to that subcontractor or his workers commencing on any Taylor's site.

Name: Andrew Andreou

Signed: **Date:**

7.6 PROJECT SAFETY ADVISOR

The project safety advisor is responsible for:

- Providing visible commitment to a safe and healthy work environment by ensuring regular reviews are undertaken, and by participating in safety and health meetings and consultation regarding WHS matters;
- Assisting the HSE manager and project teams in implementing Taylor's health, safety and environmental procedures, policies and project systems in line with best practice and the relevant statutory legislation;
- Reporting any serious incident or near miss immediately to the HSE manager;
- Safeguarding compliance and maintenance of the company's third-party accreditations;
- Assisting project teams and subcontractors in meeting their workplace health and safety obligations;
- Ensuring compliance to this project Workplace Health and Safety Plan;
- Monitoring subcontractor's compliance with the site Safety Plan, and subcontractor compliance to their Safe Work Method Statements by conducting regular task observation/ audits;
- Where requested, assisting the project/ site manager with completing site inductions, project reports and daily diary entries;
- Undertaking workplace inspections to identify hazards and unsafe/ unhealthy workplace conditions and practices;
- Assisting the site manager/ area foreman in the management and supervision of subcontractors;
- Reporting incidents and/ or identified hazards and appropriate risk control measures to line managers;
- Assisting the project team in obtaining and auditing subcontractor's workplace health and safety documentation;
- Ensuring all workplace health and safety documents are maintained and filed in accordance with Taylor Construction filing requirements;
- Coordinating or conducting site toolbox talks and ensure subcontractors regularly consult with their employees on matters relating to HSE;
- Following up on project-based risk assessments to ensure they are being followed and updated as necessary;
- Liaising with the project/ site manager to implement controls on hazards identified;
- Completing Safe Work Method Statement checklists for the site (task observation);
- Collating completed contractor forms and checklists;
- Acting site safety representative for the site (unless another person has been elected to perform this role as per the consultation statement **S-F-04 WHS Consultation Statement**);
- Other HSE and/ or CW's issues or activities that may require their attention.

If no safety advisor is allocated to the project, the roles and responsibilities mentioned above are to be allocated to alternative Taylor Construction persons engaged on the project who are competent or have been suitably trained to full fill these duties.

Name:

Signed: **Date:**

7.7 SITE MANAGERS

The site managers are responsible for:

- Providing visible commitment to a safe and healthy work environment by ensuring regular reviews are undertaken, and by participating in safety and health meetings and consultation regarding WHS matters;
- Unless otherwise nominated, undertaking the role of site safety advisor for safety issues and control of the site. This role is supported by the project manager and the HSE manager;
- Implementing, through consultation with the project manager, the Site Safety Plan in accordance with WHS legislation, regulations, codes of practice, Australian Standards and/ or other statutory requirements;
- Ensuring the project's site workers comply with the Taylor Construction project Safety Plan;
- Ensuring all workers and, if required, visitors, are site-specific inducted and aware of any compliance obligations;
- Ensuring site security and site-specific signage is fixed to key access, internal and perimeter areas including 24-hour project contact details, attendance details for visitors, PPE requirements and construction zone signage;
- Implementing and undertaking formal and proactive consultation measures between the project team and subcontractors;
- Ensuring items identified by safety or systems audits are rectified within specified timelines in consultation with the project manager, HSE manager and subcontractors;
- Consulting with all persons on safety issues, including changes to the workplace, and encouraging the involvement of all personnel in achieving a safe and healthy site;
- Managing any site-specific workplace health and safety issue in the first instance and discussing these with the project manager and/ or HSE manager as required;
- Developing, planning, implementing and reviewing site-specific emergency and evacuation procedures;
- Monitoring subcontractor's compliance with the site Safety Plan, in particular subcontractor's compliance to their Safe Work Method Statements, by conducting regular task observation/ audits;
- Identifying any hazards and assessing any risks on site and implementing risk control measures;
- Prior to commencement, reviewing subcontractor's WHS Plan/ SWMS with regard to the specific site task using forms **SE-F-14 Safe Work Method Statement Review Form** and **SE-F-14.1 Contractor's HSE Plan Review**;
- Ensuring that requirements contained in **SE-F-14 Safe Work Method Statement Review Form** and **SE-F-14.1 Contractor's HSE Plan Review** are met prior to works commencing on site;
- Periodically throughout the contractor's works, reviewing compliance with SWMS and sign off on the SWMS Checklist;
- Leading or participating in formal site safety inspections weekly and record results using **SE-F-02 HSE Inspection Checklist**. Daily informal inspections should be noted in site diary;
- Utilizing experience and judgement to shut down and/ or evacuate any part of the site if a major health and safety risk occurs;
- Investigating, recording and reporting incidents and initiating corrective and action plans by relevant personnel. Reporting any serious incident immediately to the project manager and HSE manager;
- Providing support and assisting with rehabilitation of employees who have been injured at work by encouraging their early return to normality through work-based rehabilitation programs;
- Completing site diaries as per project administration requirements and forwarding that data to the HSE manager;
- Reviewing, coordinating and implementing emergency evacuation procedures and participating in drills at specified intervals (quarterly);
- Ensuring that all plant and equipment used on Taylor Construction sites are safe, correctly maintained and that the operator is correctly licensed or qualified for manipulating that equipment;
- Safeguarding compliance and maintenance of the company's third-party accreditations.

Name: David Pereira

Signed: **Date:**

7.8 SITE FOREMAN

The site foreman is responsible for:

- Implementing, through consultation with the project manager, the Site Safety Plan in accordance with WHS legislation, regulations, codes of practice, Australian Standards and/ or other statutory requirements;
- Assisting with the review and monitoring of subcontractor's Safe Work Method Statements (SWMS) in consultation with the senior site manager and site safety officer. Ensure that all requirements of forms **SE-F-14.1 Contractor's HSE Plan Review** and **SE-F-14 Safe Work Method Statement Review Form** are met and implemented on site;
- Ensuring no work is undertaken on site until the relevant SWMS has been reviewed and signed off in accordance with form **SE-F-14 Safe Work Method Statement Review Form**;
- Monitoring subcontractor's compliance with the site Safety Plan and, in particular, subcontractor's compliance to their Safe Work Method Statements by conducting regular task observation /audits;
- Ensuring periodic reviews for compliance/ suitability of SWMS relevant to works under their control;
- Ensuring that site personnel comply with the Taylor Construction project Safety Plan;
- Ensuring all workers and, if required, visitors, are site-inducted and aware of any compliance obligations;
- Ensuring that site security and site-specific signage is fixed to key access internal and perimeter areas, including 24-hour project contact details, and that they are legible and current;
- Assisting with implementing and undertaking formal and proactive consultation measures between the project team and subcontractors;
- Ensuring items identified by safety or system audits are rectified within specified timelines in consultation with the project manager, site manager, site safety advisor and subcontractors;
- Consulting with all persons on safety issues, including changes to the workplace, and encouraging the involvement of all personnel in achieving a safe and healthy site;
- First response in managing site-specific workplace health and safety issues in the first instance, and discussing these with the project manager, site manager and/ or site safety advisor as required;
- Assisting with developing, planning, implementing and reviewing site-specific emergency and evacuation procedures;
- Monitoring subcontractor's compliance with the site Safety Plan, in particular subcontractor compliance to their Safe Work Method Statements;
- Identifying any hazards and assessing any risks on site and implementing risk control measures;
- Leading or participating in formal site safety inspections **weekly** using form **SE-F-02 HSE Inspection Checklist**. **Note**: informal inspections should be noted in site diary;
- In consultation with the project manager and the senior site manager, and utilizing experience and judgement, shut down and/ or evacuate any part of the site if a major health and safety risk occurs;
- Investigating, recording and reporting incidents, and initiating corrective action plans by relevant personnel. Reporting any serious incident immediately to the project manager, the senior site manager and the HSE manager;
- Monitoring the use of personal protective equipment (PPE) by site personnel;
- Completing site diaries as per project administration requirements;
- Assisting with reviewing, coordinating and implementing emergency evacuation procedures and participating in drills at specified intervals, minimum every six months;
- Ensuring that all plant and equipment used on Taylor Construction sites are safe, correctly maintained and that the operator is correctly licensed or qualified for operating that equipment;
- Assisting with archiving project safety records and information.

Name:

Signed: **Date:**

7.9 CONTRACT ADMINISTRATOR/ SITE ENGINEER

The contract administrator and site engineer's responsibilities are:

- Support the project and site management in the management of employee, subcontractor and suppliers' performance in complying with Taylor Construction WHS and the site-specific rules for the project;
- Assist the project/ site manager to ensure the site Safety Plans and associated documentation, including standard forms, procedures and templates, remain current and up to date;
- Where required, assist the project and site manager with site inductions;
- Include in subcontract agreement the requirement for subcontractors to carry out their works in accordance with the company's or subcontractor's approved Safety Plans;
- Forward to subcontractors a copy of HSE subcontractor requirement **Contractor's HSE Requirements QSE-F-15.23** (letter template), ensuring this is completed and returned by subcontractor prior to commencing;
- At the tender interview stage, discuss with the subcontractors their obligation for managing HSE requirements by issuing to them relevant sections of the tender interview form and ensuring this is completed by subcontractor prior to commencing on site;
- Request and obtain from the subcontractor copies of their Quality and Safety Plans;
- Using returned form to assess subcontractor's abilities to comply with HSE requirements and make recommendations to the project/ site manager;
- Request and obtain from the subcontractor copies of their Workers Compensation and Public Liability Certificates of Currency, ensuring they are current and that copies are available on site;
- Ensure that all completed copies of form **Contractor's HSE Requirements QSE-F-15.23** (letter template) are returned and filed in the project files and a copy uploaded onto U-drive;
- Ensure that the latest copies of Project Plans and HSE Risk Assessments are uploaded onto Project Centre, or preferred data control system used, and engaged subcontractors have access to these;
- Assist the project, site and safety managers in conducting project audits, reporting on safety compliance and maintaining safety records;
- Ensure all **external** complaints/ incidents are recorded on **SE-F-21 Incident Report Form** and filed in the External Complaints Register located in the OHS folder in the U-drive;
- Assist project and site management in the general administration of HSE where requested.

Name: Scott Dobson

Signed:

Date:

Name: Shanil Prasad

Signed:

Date:

7.10 BUILDING CADET

The building cadet health, safety and environmental responsibilities are:

- Provide general assistance to management on an assigned project;
- Provide administrative assistance in managing site safety, quality assurance and environmental management systems;
- Maintain project registers and records;
- Provide assistance with site contract administration and tendering;
- Manage project document control and provide design management assistance;
- Assist with on-site supervision;
- Assist the project/ site manager to ensure the site Safety Plans and associated documentation, including standard forms, procedures and templates, remain current and up to date;
- Forward to subcontractors a copy of HSE subcontractor requirement form **QSE-F-15.23 Contractor's HSE Requirements** (letter template), ensuring this is completed and returned by subcontractor prior to works commencing;
- Assist the project, site and safety managers with conducting project audits, reporting on safety compliance and maintaining safety records;
- Where required, assist the project and site managers with conducting site inductions;
- Fulfil responsibilities as outlined in the 'Taylor Cadet Program Guidelines', including undertaking an approved course of study at an Australian University;
- Assist project and site management in the general administration of HSE where requested;
- Monitor the use of personal protective equipment (PPE) by site personnel;
- Complete site diaries as per project administration requirements.

Name:

Signed: **Date:**

7.11 FIRST AID OFFICERS

It is the job of the trained first aider to provide initial treatment to injured or ill employees, which is consistent with first aider's level of training and competency. Where the treatment required is beyond a first aider's level of competency, they should recommend that the employee seek immediate medical assistance.

The nominated site first aid officers shall possess the required level of competency (Senior First Aid Certificate or Occupational First Aid Certificate) and they shall be responsible for:

I. Providing first aid assistance to persons ill or injured on site;
II. Recording all such assistance provided;
III. Liaising with the site manager and/ or site foreman to achieve first aid obligations.

First aid officer records:

The nominated first aider shall be relied upon to exercise a common sense-approach in determining what type of injuries require a first aid report to be completed. First aid/ incident reports shall only be completed for injuries or illnesses for which first aid assistance was sorted **immediately** following an event. Employees, including subcontractor's, seeking to report an injury or incident for which first aid assistance was not initially sort **shall not** be provided with a copy of the report unless this has been authorised by the site/ project manager and/ or Taylor Construction HSE manager.

Some typical injuries that may require reporting are:

- All injuries requiring off-site medical treatment;
- Impact injuries;
- Head injuries;
- Musculoskeletal injuries;
- Open wounds (cuts);
- Eye injuries.

The first aid officers shall also be responsible for the regular maintenance and replenishment of the first aid kits and equipment.

Name: ……………………………… Signed: …………………………… Date: ……………..

Name: ……………………………… Signed: …………………………… Date: ……………..

7.12 PCBU AND WORKERS

PCBU and workers are responsible for:

- Attending Taylor Construction site-specific induction prior to commencing work on site;
- Taking reasonable care for their individual health and safety and that of others on site, including members of the public;
- Familiarising themselves and adhering to Taylor Construction corporate policies;
- Performing only those works in which they possess the required competencies for, or have been suitably trained to perform;
- Taking corrective actions to eliminate hazards within the workplace and /or reporting those hazards they cannot correct;
- Reporting all injuries to a first aid officer or supervisor;
- Cooperating with Taylor Construction management in all requirements imposed in the interest of health, safety and welfare;
- Never intentionally or recklessly interfering with, misusing or removing any items and/ or equipment provided in the interest of health and safety;
- Complying with all site safety instructions and abiding by the procedures and work practices identified in the Workplace Heath Safety Project Plans and/ or as directed or informed by the site manager/ foreman;
- Complying with all relevant workplace health and safety legislation, standards and codes of practice;
- Reporting promptly to a site manager/ foreman any unsafe conditions, practices or defects discovered in any control measures, including personal protective equipment;
- Maintaining safe work practices when working with, or near, hazardous substances, so that their own health and safety, and the health and safety of those around them, is maintained;
- Using personal protective equipment (PPE) as required. The equipment should be kept clean and maintained in an appropriate manner;
- Practicing a high-standard personal hygiene in and around all amenity areas such as lunch, change and toilet facilities by washing thoroughly and removing all protective clothing before eating, drinking and smoking.

References:

- Roles, Responsibilities and Authorities Procedure QSE-P-06

8. INDUCTION

Taylor Construction employees, including those workers engaged by or working on behalf of the subcontractors, are required to be site-inducted prior to commencing work on the site. General environmental awareness and specific environmental requirements of this PEMP must be incorporated into the site-specific induction as required.

As a minimum, inductions must include the following environmental information:

- Community issues;
- Hours of operation;
- Noise and vibration;
- Dust management;
- Traffic access;
- Washing requirements for construction plant and equipment;
- Storage and handling of fuels, oils and other chemicals;
- Waste management: recycling, disposal, litter;
- Soil and water issues: controls, tracking of mud off-site.

Where there are significant environmental issues identified for the project, these must be incorporated into the site-specific induction. These may include but shall not be limited to (where required):

- Environmentally sensitive areas of the site (specify details in this section);
- Contaminated or Acid Sulphate soils;
- Endangered flora and fauna;
- Environmental controls and management;
- Noise emissions;
- Plant emissions;
- Archaeology and heritage management.

References:

- SE-F-11 Site Induction Form and Mandatory Safety Requirements
- SE-F-11a Induction Register

9. TRAINING AND COMPETENCY

All persons undertaking work on the project (employees and subcontractors) must be trained and competent to carry out their work. This includes undertaking tasks in an environmentally sound manner.

Subcontractors shall be responsible to ensure that Taylor Construction Environmental Risk Management, as prescribed in chapter 11.3 of this plan, are adopted and controls, as contained in Taylor's **HSE-R-01 HSE Risk Register,** are implemented when developing their systems of work.

The subcontractor shall be responsible to consult and train workers under their management in agreed environmental system. Evidence of appropriate training shall be made available by the subcontractor to Taylor Construction upon request by a Taylor nominated representative.

The project/ site management, along with relevant members of the project team, must be made aware of the requirements of the Taylor Environmental Management System and shall be required to attend Environmental Awareness and Due Diligence training sessions when organised by the company.

References:

- QSE-P-19 Training, Competency and Awareness Procedure
- WHS-PLAN-02 Project Workplace Health and Safety Plan (PWHSP)

10. COMMUNICATION

The requirements for internal and external communication are outlined in the QSE Management System Manual. The following provides essential information in relation to environmental communication on projects.

10.1 INTERNAL COMMUNICATIONS

Essential information relating to project environmental management will be communicated through toolbox talks and inductions.

Environmental alerts will be periodically prepared and sent to sites for posting on notice boards.

Key changes to environmental legislation will be sent by email to all project managers and site managers

10.2 EXTERNAL COMMUNICATIONS - COMMUNITY

Community complaints must be reported as environmental incidents and all correspondence relating to the complaint must be retained and filed on site, including information on how the complaint was resolved.

All community consultation will be completed by Department of Education with TCG notified as required. All community complaints will be notified to the relevant stakeholders in line with clause B8 of the SSDA. The majority of these tools will be implemented by the Department of Education with TCG assisting as required.

Examples of Communication Tools:
- Information Line
- Hotline Scripts
- Display Boards
- Letterbox Drops
- Information Booths

10.3 REGULATOR SITE VISITS AND WRITTEN COMMUNICATIONS

If an authorised officer *(*Council or DECCW representative*)* visits your site, you should contact the HSE manager or construction manager for assistance and advice. While you can request that a higher level of management assists you, you cannot refuse to answer questions. An authorised officer must show their identification on request (ensure you ask for it) and has the right to ask any person on site questions relating to environmental issues. When being enquired, always be polite, discuss only the facts and do not elaborate or provide opinions.

Any Penalty Infringement Notices or official warnings from regulators are to be treated as ‘incidents’ and reported in the Incident Report Form, investigated and corrective actions assigned and completed to address the root cause of the infringement.

Any communication from a regulator must be notified to the HSE manager. Records of all communications must be retained and appropriately filed.

All Incident Reports and NCRs will be provided to the superintendent for notification to the Planning Secretary as per the requirements of the SSD

11. ENVIRONMENTAL RISKS

11.1 STANDARD OPERATING PROCEDURES

Several standard operating procedures have been developed as part of the HSE Management System to provide detailed information on the management of site issues in relation to environmental and safety risks. The following procedures have been developed to date and are available on SharePoint:

- SE-OP-01 Hazardous Substances and Dangerous Goods Procedure
- E-OP-01 Erosion and Sedimentation Controls
- E-OP-02 Waste and Resource Management
- QSE-OP-02 Asbestos Management Procedure
- SE-OP-04 Noise Management (OHS and Environmental)

11.2 SAFE WORK METHOD STATEMENTS (SWMS)

While Safe Work Method Statements are primarily used in WHS to manage high-risk activities, any relevant or foreseen environmental risk must also be considered in the preparation of the SWMS.

Taylor's site managers or their nominees are responsible for ensuring that subcontractors include environmental issues in their task-specific SWMS by using **SE-F-14**. If environmental issues are not appropriately addressed, the subcontractor should be advised of the requirements. It is recommended that subcontractors are assisted with identifying environmental issues, particularly during the early implementation of Taylor's Environmental Management System and PEMP.

References:

- SE-F-03 Taylor Construction Group Safe Work Method Statement
- SE-F-14 Safe Work Method Statement Review Form
- SE-F-14.1 Contractor's HSE Plan Review

11.3 ENVIRONMENTAL RISK MANAGEMENT AND CONTROL

This section provides an overview of environmental issues typically encountered on site based on the generic issues identified in the master Environmental Risk Assessment. When preparing this document, the project manager should add any additional environmental issues that may have been identified through the environmental impact assessment, development consent/ approval, etc.

11.3.1 PROJECT DESIGN – ENVIRONMENTAL CONSIDERATIONS

During the planning phase of the project, consideration should be given to the following:

- How will design minimise energy use and allow for and use the natural environment?
- How will materials, products and systems be selected or designed to minimise adverse impacts and/ or benefit the environment?

These questions should be considered prior to commencement of the project and may require the input from the client.

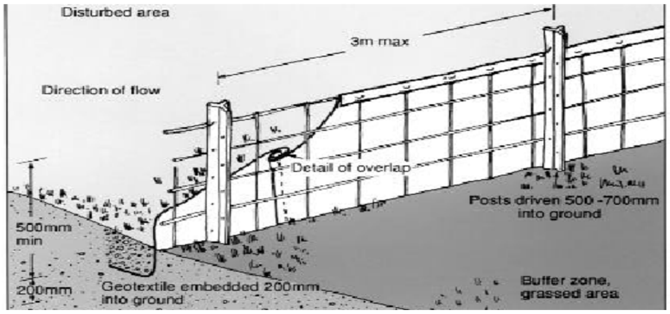
11.3.2 SOIL AND WATER MANAGEMENT/ SEDIMENTATION AND EROSION CONTROL

Taylor Construction Group and subcontractors shall plan and carry out works to avoid erosion and prevent sediment leaving the site to the surrounding land, watercourses, water bodies, wetlands and storm water drainage systems. This includes the installation of erosion and sedimentation controls prior to commencing clearing works. Where possible, works should be staged to reduce the areas cleared at the same time to minimize soil disturbance. Where required, prepare erosion and sediment control plans (ESCP), install the controls in accordance with the plan and maintain them regularly. For more detailed information, refer to the procedure and external guidelines listed below.

The following controls will be implemented within Taylor Construction site boundaries to control erosion, sediment and pollution within the site:

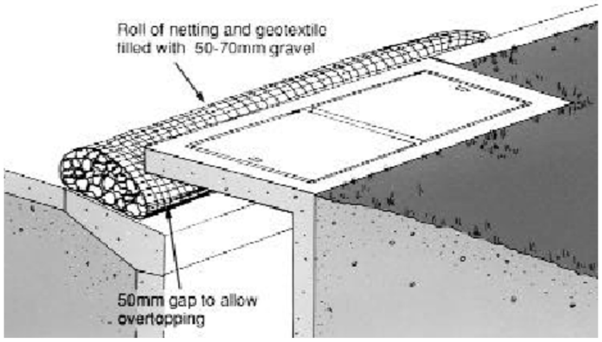
Sediment and erosion control devices. Unnecessary disturbance of the site shall not occur, and all cuts are to be stabilised as soon as possible after the completion of site earthworks. Extra care will be taken to prevent sediment run-off into all neighbouring lots and storm water. Any collected silt will be disposed of in accordance with all other relevant codes and standards.

Silt fences. Silt fences are to be installed to site boundaries as required. Geotextile fabric will be fixed to the temporary construction fencing where 'downhill' boundaries exist. The fabric will be turned down under the existing ground line and secured at regular intervals not exceeding 3m, in accordance with the following diagram:



Vehicle access. Vehicular access will be controlled to prevent sediment being tracked. This will be done by maintaining an all-weather access/ driveway composed of an approved course aggregate surface. Moreover, if the need arises, a shaker grid will be installed to the main access by Taylor during the construction works. Any sediment that is tracked onto the surrounding roads will be cleaned off in a timely manner.

Storm water inlets. All storm water inlets are to be covered with geotextile fabric in a roll or other format to ensure that no sediment enters into the storm water system. This will be the responsibility of the site manager to enforce. The rolls will not only be placed directly at the inlets as shown below, but also at regular intervals in the gutters 'upstream' from the inlets, creating multiple barriers.



Stockpiles. If appropriate topsoil is to be stockpiled on site, then the following measures will be put in place:

- Stockpiles shall be stored at least 2 metres away from drainage lines, natural watercourse and established trees;
- Stockpiles will have temporary silt fences around it to create an enclosure and, if necessary, they will be covered with shade cloth or tarpaulin to retain the materials inside it. The location of stockpiles will be determined on site.

Monitoring. To maintain the various erosion and sediment control devices, regular inspections, repairs and cleaning will be carried out on the silt fences to the boundaries, stockpiles, waste enclosures and to the stockpile covers.

References:

- E-OP-01 Erosion and Sedimentation Controls Procedure
- Managing urban stormwater: soils and construction, Volume 1, 4th edition, 2004

11.3.3 VEGETATION MANAGEMENT

Taylor Construction Group and subcontractors shall plan the works to preserve existing trees, plants and other vegetation, that are to remain within or adjacent to the works. Areas of the site that contain vegetation that must be preserved should be fenced-off, marked or otherwise isolated to ensure they are not inadvertently damaged. If there are any endangered species on site, specific management techniques may be required; these should be addressed in an Environmental Impact Assessment.

On completion of the works, all areas disturbed by construction activities shall be restored to the contract specifications. Where required and practical, efforts will be made to mulch and re-use vegetation on site or send it to a green waste recycling facility.

11.3.4 WASTE MANAGEMENT AND RESOURCE RECOVERY

Taylor Construction Group and subcontractors shall adopt the hierarchy of waste (avoid, reduce, reuse, recycle/ reprocess), dispose to maximise resource recovery and minimise disposal wherever possible and practical. The importance of appropriate waste management practices is to be included in the site induction.

Sites are to be provided with suitable bins and skips for appropriate collection and separation of waste and recyclables, and these are to be collected with appropriately qualified and licensed (where required) waste contractors.

Prior to disposal, waste must be classified in accordance with the DECCW Waste Classification Guidelines (latest version 2014) prior to transporting waste off-site. Excerpts from the waste classification guidelines are contained within appendix B of the **Waste and Resource Management Procedure E-OP-02**. Waste receipts must be kept for legal requirements; details of waste separated and disposed of is to be documented in the **Waste and Recycling Register QSE-R-16**. The information from the register is to be used to complete the waste management section of the KPI Monthly Report Form and forwarded to the HSE manager for tracking of TCG environmental targets.

References:

- E-OP-02 Waste and Resource Management Procedure
- SE-F-23 KPI Monthly Report Form
- QSE-R-16 Waste and Recycling Register

11.3.5 NOISE MANAGEMENT

From an environmental viewpoint, noise can create a nuisance to neighbours and members of the public and is subject to legal requirements. Taylor Construction Group and subcontractors shall make all practical efforts to comply with statutory requirements for noise management and minimize nuisance to neighbours. Protection of the Environment Operations Act 1997 (sections 139 and 140) and the Department of Environment and Climate Change NSW ‘Interim Construction Noise Guideline’ risk controls for noise must be incorporated in relevant Safe Work Method Statements, including nuisance to neighbours. Where required by development consent conditions, environmental noise monitoring will be undertaken as per the conditions. Further information on noise management from a WHS and environmental viewpoint is contained within the Noise Management Procedure.

References:

- SE-OP-04 Noise Management Procedure

11.3.6 WATER QUALITY MANAGEMENT

Taylor Construction Group and subcontractors shall comply with the requirements of section 120 of the Protection of The Environment Operations Act 1997 (Prohibition of Pollution of Waters). The act prohibits all forms of water pollution unless specifically authorised through and environment protection license (EPL). On most projects undertaken by Taylor Construction, an EPL will not be required.

There are substantial penalties for individuals and the company and controls must be in place to ensure that site activities do not cause water pollution.

Potentially hazardous activities, including washing out of concrete delivery vehicles and washing down of construction plant, are not permitted on site except in specially constructed bays that retain high PH water. Washing out of concrete delivery vehicles off-site is only permitted at locations approved for that purpose by the appropriate authority. Drains will be labelled to reduce likelihood of misuse.

Washing of paint brushes must be undertaken to avoid any paint wash-water entering drains or waterways. Wash-water must be removed from site and appropriately treated and/ or disposed of. The chemicals, acids or residue from any 'wet trades' such as brick cleaning must also be prevented from entering drains and waterways.

All liquids and materials that could cause water pollution must be stored in areas with secondary containment. Also refer to section on hazardous substances, chemicals, oils and other contaminants and the related procedure.

Pumping of storm water. If a sediment basin is required and storm water is required to be pumped out of the site, the pump intake is to be located no more than one metre (1m) below the surface of the collected water to reduce the amount of settled silt being pumped out for further treatment.

Storm water treatment. There are two treatment options for storm water collected on site, flocculation and/ or filtration. For each option the applicable procedures in their entirety are to be followed.

References:

- SE-OP-01 Hazardous Substances and Dangerous Goods Procedure
- Storing and Handling Liquids - Environmental Protection (DECCW)

11.3.6 GROUND WATER MANAGEMENT

Refer to annexure appendix 13 for further details. Furthermore, see brief commentary.

- Groundwater was encountered within the three monitoring wells installed during the DSI, between 3.85 and 3.87 metres below top of casing (existing ground level) within the natural sands.
- Concentrations of contaminants were generally detected below the screening criteria, with the exception of a very minor exceedance for copper above the Groundwater Investigation Level (0.002 mg/L). This is considered a function of regional water quality.
- Our understanding of the planned construction is that proposed excavations would not encounter groundwater, being generally shallow (approximately 2 mBGL maximum). No dewatering or extractive activities are proposed; therefore, management is unlikely to be required.
- During construction, risks of groundwater contamination such as spills and leaks from on-site plant will be controlled via implementation of the Construction Environmental Management Plan, ensuring good environmental practice.

11.3.7 AIR QUALITY MANAGEMENT

Taylor Construction Group and subcontractors shall comply with all statutory requirements governing air quality management, i.e. Protection of The Environment Operations (POEO) Act 1997, section 124, and the POEO Clean Air Regulation 2010.

The project/ site manager will ensure that all construction facilities erected at the site are designed and operated to minimise the emission of smoke, dust, cement dust, plant and vehicle exhausts and other substances into the atmosphere.

Taylor Construction Group and subcontractors shall employ construction methods that will keep the air pollution to a minimum and apply measures such as those listed below to ensure that airborne pollutants do not cause pollution and nuisance near the works:

- The spraying of disturbed soil and roads with water whilst under construction as required;
- The removal of mud from the wheels and bodies of plant and vehicles before it enters public roads or other sealed pavements. This could be rumble grids, dry brushing, wheel wash, etc., depending on the nature of the site;
- The removal of mud or dirt spilt by construction equipment onto public roads or other sealed pavements;
- The provision of coverings or stabilization of topsoil stockpiles;
- Covering all loads leaving the site;
- Stabilisation of ground likely to be exposed for significant time periods (e.g. using sterile seed);

- Fitting power tools with dust collection devices where practical;
- Keeping all plant and equipment well maintained and not leaving them idling while not being used;
- Reporting excess air emissions from plant and arranging for a service to fix the problem.

On-site burning of any materials is not permitted on Taylor Construction sites.

11.3.8 HAZARDOUS SUBSTANCES, CHEMICALS, OILS AND OTHER CONTAMINANTS

Prior to commencing work on site, an assessment of the quantities and locations of hazardous substances, chemicals, etc. likely to be held on site must be undertaken. The location of hazardous substances and other contaminants must be marked on a site map (refer to appendix 5). The site manager will use the assessment when planning the works to minimise the potential for pollution. This includes providing appropriate storage; separation of incompatible materials and bunding; and ensuring that all activities that use or handle these substances are undertaken in an area that will not cause water pollution or land contamination.

Spill kits will be provided wherever substances that could potentially cause pollution are stored and handled. Relevant site personnel will be trained in spill response and will be familiar with the contents and function of the spill kit materials on site. All spills, no matter how small, must be cleaned up immediately and be 0reported as an environmental incident.

Refuelling or maintenance of plant and equipment, or any other activity which may result in the spillage of a chemical, fuel or lubricant on the site, is not permitted without appropriate temporary controls measures.

The use and storage of any hazardous substances or other chemicals will be made strictly in accordance with the manufacturer's instructions and the relevant materials safety data sheets (MSDS).

References:

- SE-OP-01 Hazardous Substances and Dangerous Goods Procedure
- Storing and Handling Liquids - Environmental Protection (DECCW)

Spill response. Major spillages must be notified immediately, and all efforts made to contain the spill and prevent escape into storm water drains and waterways, provided it is safe to do so. If the spill is beyond the capacity of the site personnel to contain and clean up, specialist services must be employed.

Minor spillages must be cleaned up immediately. If soil or ground is contaminated, the soil is to be removed and placed into a bag or designated waste drum and disposed of appropriately.

If the spill enters drains or waterways, the incident may be required to be reported to the appropriate regulatory authority (local council) as soon as practicable, in accordance with the duty to report under the POEO Act. The decision to report must be discussed with the HSE manager or a director prior to making the report.

Spill response procedures for this project are:

- Provide site map showing location of all hazardous substances, chemicals, fuels, oils, spill kits, storm water drains and natural waterways (appendix 5);
- Spill Response Procedure flow chart (appendix 3);
- Call emergency services (fire, hazmat): call 000
- Local council phone number: _________________________
- MSDSS are located at: ______________________________

11.3.9 PESTICIDE USE AND STORAGE

If pesticides are used at the site, they must be stored appropriately as per 'hazardous substances' section (11.3.8 above) and used in accordance with the manufacturer's requirements and the NSW Pesticides Management Act and Regulations. The act and regulations have strict record keeping requirements for the use of more than 20 litres of product.

Taylor Construction Group general policy on the use of pesticides is that they should only be applied by suitably qualified pest control contractors.

11.3.10 CONTAMINATED LAND

Prior to commencing project work, checks should be made on the potential for the site to be contaminated. This should generally be identified by the client and addressed in an Environmental Impact Assessment. If the site is found to be contaminated, the recommendations for management of the contaminated soils from the assessment and other reports should be incorporated into this PEMP below.

Should contamination be suspected once working on the site (e.g. unusual odours, visual indications of soil or water pollution, etc.) work should cease immediately and the Taylor's project/ site manager contacted. Where relevant, the client should be notified by Taylor's project manager and investigations undertaken into the nature of the contamination. Work should not recommence until the nature and extent of the contamination is established and can be safely managed without environmental risk.

Taylor Construction Group and subcontractors shall comply with relevant statutory requirements of Contaminated Land Management Act and the POEO Act (NSW) in relation to disturbance or treatment of potentially contaminated ground.

The company shall install any control measures needed to divert surface run-off away from contaminated ground and to treat any surface run-off contaminated by exposure to contaminated ground. Contaminated material removed from site must be recorded on the **Waste and Recycling Register QSE-R-16**.

References:

- Waste and Recycling Register QSE-R-16

11.3.11 ACID SULPHATE SOILS (ASS)

Acid sulphate soils are naturally occurring soils generally found in estuarine areas. When exposed to air, they can oxidize and cause run-off of highly acid water. Acid sulphate soils require specialist management techniques.

The client should be aware of any potential for encountering acid sulphate soils and, if there is a potential, it should be addressed in the Environmental Impact Assessment undertaken for the project.

11.3.12 COMMUNITY COMPLAINTS

Community complaints should be treated as 'incidents': they must be reported to the HSE manager, be thoroughly investigated and reported on SharePoint. Reference to these are also to be documented and included in site diary entries. The project or site manager should try to resolve the issue with the community member in a conciliatory manner.

References:

- SE-F-21 Incident Report Form
- SE-F-22 Incident Investigation Form (report on SharePoint – forms are back-up only)
- SE-F-23 KPI Monthly Report (as above)

11.3.13 ARCHAEOLOGY AND HERITAGE MANAGEMENT

If any unexpected heritage item is discovered during maintenance and construction works, the following must be taken into consideration:

Indigenous heritage. All aboriginal objects, regardless of significance, are protected under law. Should any deposit, artefact or material evidence (including skeletal remains) of Aboriginal origin be found, Taylor Construction Group and subcontractors **shall cease all construction works that might disturb or damage** the deposit, artefact or material. The project manager will notify the client immediately, who will then consult the relevant government department (i.e. EESG or DPIE). Examples of Aboriginal objects include stone tool artefacts, shell middens, axe grinding groves, pigment or engraved rock art, burials and scarred trees.

Historic heritage. Historic (non-Aboriginal) heritage items may include archaeological 'relics' and other historical items such as works, structures, buildings or moving objects. Should any item which is suspected to be of historical heritage value be encountered, Taylor Construction Group and subcontractors **shall cease all construction works that might disturb or damage the item**. The project manager will notify the client immediately, who will arrange for an officer from the relevant government heritage department to be consulted. A 'relic' is 'any deposit, artefact, object or material evidence that relates to the settlement of the area, not being Aboriginal settlement; and is of State or local heritage significance'. It can include bottles, remnants of clothing, pottery, building materials and general refuse.

References:

- Heritage Act 1977
- National Park and Wildlife Act 1974
- Unexpected Heritage Items Procedure – Roads and Maritime Services, 2015

11.3.14 ADDITIONAL ENVIRONMENTAL ISSUES

As required by the SSDA for the project, TCG will endeavour to ensure all external lighting during construction meets the requirements for AS 4282-2019 Control of the obstrusive effects of outdoor lighting. TCG will engage specialty consults to provide advice regarding the light type and locations to ensure compliance to this clause.

The Remediation Action Plan details 80818157

12. INCIDENT AND EMERGENCY MANAGEMENT

12.1 EMERGENCY RESPONSE

The Emergency Response Plan for this site has been developed based on a template provided in the **SE-P-07 Project Emergency Control Management Plan**. Additional information for the management and control of emergency situations can be found in the Project Safety Plan (**WHS-PLAN-02**) but a Spill Response Procedure Flow Chart is contained in appendix 3 of this plan. For additional information on response to a spill, refer to section 11.3.8 'Spill response'.

Emergency response posters and flow charts are to be posted in the site and induction office, WHS notice boards, in crib rooms and other areas of the site as required.

References:

- SE-P-07 Project Emergency Control Management Plan
- QSE-F-10.1 Pre-Start Site QSE Checklist
- SE-F-31 Emergency Evacuation Rehearsal Register
- SE-F-05 Site Layout Evacuation Plan
- SE-F-06 On-Site Emergency Control Plan

12.2 INCIDENT REPORTING AND INVESTIGATION REPORTING

Site environmental incidents must be reported to the project/ site manager as soon as practically possible. In addition, any major environmental incidents must also be reported to the HSE manager in accordance with the **Incident Reporting and Investigation Procedure QSE-OP-05**. The priority is to ensure that the situation is controlled as soon as possible and to avoid further pollution or other adverse environmental consequences. Reporting of the incident should not delay any immediate responses to the incident.

Incident Reports must be completed and forwarded to the HSE manager within 24 hours and must be kept for a minimum of five (5) years.

Environmental incidents that cause, or threaten to cause, material environmental harm must be reported to the Appropriate Regulatory Authority (ARA, the local council in which the project is located) as soon as practicable following the incident. This would include any spillage or leak of substances that cause water or land pollution. Material environmental harm generally means that the harm is not trivial and/ or costs more than $10,000 to clean up. The phone number of the ARA should be included in the Emergency Response Plan.

If the site manager believes that the incident may be reportable to the Appropriate Regulatory Authority (ARA), contact the WHS manager for further advice prior to making an Investigation Report.

All environmental incidents that causes, or could potentially result, in an environmental harm are to be investigated, and corrective actions implemented following the investigation. Depending on the seriousness of the incident, key site personnel, the HSE manager, witnesses, etc. should be consulted on the investigation and in determining appropriate corrective or preventive actions.

The Planning Secretary must be notified in writing to compliance@planning.nsw.gov.au immediately after the Applicant becomes aware of an incident. The notification must identify the development (including the development application number and the name of the development if it has one) and set out the location and nature of the incident.

References:

- QSE-OP-05 Incident Reporting and Investigation Procedure
- SE-F-21 Incident Report Form (report on SharePoint – forms are back-up only)
- SE-F-22 Incident Investigation Form (as above)

12.3 UNEXPECTED CONTAMINATION PROCEDURE

The Remediation Action Plan Plan provide action following the discovery of unexpected contamination. This procedure is to be followed and the required stakeholder contacted as detailed in the communication section of this plan. This is to be developed further with consultation with civil contractor.

13. ENVIRONMENTAL MONITORING AND INSPECTIONS

13.1 SITE ENVIRONMENTAL INSPECTIONS

Site environmental inspections are to be undertaken weekly using **SE-F-02 HSE Inspection Checklist** to ensure that environmental hazards are recognised and can be promptly rectified. Additional environmental issues may be added to the site HSE inspection form as required.

13.2 PHYSICAL MONITORING

For many projects undertaken by Taylor Construction, physical environmental monitoring is not typically required (e.g. dust, water quality, noise levels, air quality, etc.). Should the Environmental Impact Assessment specify that environmental monitoring is required, the project manager will arrange for appropriately qualified consultants to undertake that monitoring. All equipment used to measure environmental parameters will be calibrated in accordance with manufacturer's instructions.

13.3 MONITORING OF PROJECT ENVIRONMENTAL TARGETS

Objectives and targets for the project are specified under ‘Objectives and Targets’ section of the PEMP. Data relating to these targets will be documented daily using site diaries, reviewed by project/ site managers on a monthly basis and forwarded to the HSE manager for reporting to senior management.

The KPI Monthly Report captures information on lag and lead indicators. The current indicators are:

Lag indicators:
- Number of environmental incidents;
- Number of penalty infringement notices (pins) or clean-up notices;
- Number of community complaints.

Lead indicators:
- Number of toolbox talks (combined with WHS and environmental issues);
- Number of environmental inspections undertaken;
- Waste and recycling volumes (initially to set benchmark, then track improvement)

Add any additional KPIs that may be set from Environmental Impact Assessments, conditions of consent and client requirements, etc.

14. NON-CONFORMITY, CORRECTIVE AND PREVENTIVE ACTIONS

Taylor Construction has a non-conformance and corrective action process in place to address all non-conformities across the business, regardless of the source. The process is defined in the **Reporting Non-Conformance, Corrective and Preventive Actions Procedure QSE-OP-29**. Typically, environmental non-conformances would result from audits, inspections and from observations by the site manager of poor environmental practices, including incorrect waste disposal/ recycling (liquid waste, poor storage of hazardous substances, oils, chemicals and damage to existing environmental controls such as sediment fencing, etc.). Non-conformances may be issued for serious breaches or repeated minor breaches.

The Planning Secretary must be notified in writing to compliance@planning.nsw.gov.au within seven days after the applicant becomes aware of any non-compliance. The Certifying Authority must also notify the Planning Secretary in writing to compliance@planning.nsw.gov.au within seven days after they identify any non-compliance.

The notification must identify the development and the application number for it, set out the condition of consent that the development is non-compliant with, the way in which it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.

References:
- QSE-OP-29 Reporting Non-Conformance, Corrective and Preventive Actions Procedure
- Notices (electronic) raising of non-conformances (internal)
- Notices (printable) for raising NCRS on subcontractors

15. PURCHASING/ PROCUREMENT

Purchasing and procurement includes the purchase of goods and the supply of services of contractors. When purchasing goods, the following environmental considerations should be considered:
- Is there a less toxic, less harmful alternative (e.g. chemicals, paints, solvents, etc.)?
- How much do we need? Will anything be wasted? Precise ordering will minimise wastage of resources and money;
- Can the product be purchased locally to reduce transport impacts?

- Are there any opportunities to use ‘green’ products in construction to improve the efficiency of the building in terms of energy and water usage (design issue – may need client input)?
- S-F-18.1 Pre-Hire Purchasing Assessment Form

When engaging contractors, the following should be taken into consideration:

- Has the environmental capability been assessed and signed-off through contract administration?
- Has the contractor attended a pre-award interview and assessed Taylor Construction Group environmental requirements?
- Has **Subcontractor Tender Interview and Assessment Form QSE-F-15.6** been completed?

References:

- QSE-OP-15 Subcontracting, Purchasing and Hiring Procedure
- QSE-F-15.6 Subcontractor Tender Interview and Assessment Form

16. CONTRACTOR MANAGEMENT

Taylor Construction Group, as the principal contractor, will ensure that contractors performing work on site are aware of the environmental requirements and enforce compliance to requirements.

Prior to commencing on site, contractors are to be inducted to the site as part of the HSE requirements. Inductions will include an environmental component to ensure all contractors are aware of the environmental risks on the project.

Contractors are required to submit Safe Work Method Statements (SWMS*)* prior to commencement of work as part of the WHS requirements. SWMS must also address the environmental risks for the tasks and will be reviewed and checked-off on **SE-F-14 Safe Work Method Statement Review Form** by the site manager to ensure that all environmental risks are appropriately identified, and controls documented.

Environmental inspections will be undertaken at least once monthly. This will include an inspection of the contractor’s work area and checking that all environmental controls are in place. Serious breaches or repeated minor breaches will result in the issue of a Non-Conformance Report, and the issue must be resolved within designated time frames.

17. ENVIRONMENTAL AUDIT

Audits of the Environmental Management System will be conducted regularly to ensure the system is appropriately in place and implemented. As part of the audit program, audits will also be undertaken on project sites for compliance to the requirements of the Project Environmental Management Plans. Audits should be undertaken by suitably experienced auditors.

Projects that have duration of more than six months will have at least one audit against the PEMP and, after the 6 months, will be audited at least once per year. This will generally be undertaken as an integrated audit in conjunction with the Project Safety Plan and Project Management Plan (Quality). Projects with high-risk activities or that performed poorly at the initial audit may be audited at a higher frequency. The HSE manager is responsible for coordinating project audits.

18. REVIEW OF THIS PLAN

This Environmental Management Plan must be reviewed by the project manager in consultation with the project team and HSE manager whenever any major change occurs on the site that may have an impact on the environment, or at least twice (every 6 months) during construction.

Further to this, the following plan will be reviewed and revised (as required) in line with Clause A40 of the SSD detailed below:

Revision of Strategies, Plans and Programs

Within three months of
a) The submission of a compliance report under condition A32
b) The submission of an incident report under condition A36
c) The submission of an Independent Audit under condition C36
d) The issue of a direction of the Planning Secretary under condition A2 which requires a review,

The strategies, plans and pograms required under this consent must be reviewed, and the Planning Secretary and the Certifying Authority must be notified in writing that ta review is being carried out. If necessary, to either improve the environmental performance of the development, cater for a modification or comply with a direction, the strategies, plans, programs or drawings required under this consent must be revised, to the satisfaction of the Planning Secretary and/or Certifying Authority. Where revisions are required, the revised document must be submitted to the Planning Secretary and/or Certifying Authority for approval and/or information (where relevant) within six weeks of the review.

Note: This is to ensure strategies, plans and programs are updated on a regular basis and to incorporate any recommended measures to improve the environmental performance of the development.

APPENDIX 1: GLOBAL MARK ACCREDITATION

global-mark

Certificate of Approval

This certificate confirms that the company below complies with the following standard:

Company Name	**Taylor Construction Group**		
Company Other Name			
Client ID	**101009**	*Scheme*	**Environmental Management Systems Scheme**
Certification Standard	**AS/NZS ISO 14001-2016: Environmental management systems – Requirements with guidance for use**		
Scope of Certification	**Design, construction, project management and property development services**		
Type of Certification	**Management System**		

CERTIFICATE DATES:

Original / Initial	**19/11/2009**	*Last Certificate update*	**18/05/2018**
Certification / Re Certification	**7/05/2018**	*Expiry*	**7/05/2021**
Last Certification Decision	**18/05/2018**		

APPROVED COMPANY/SITE ADDRESS(ES):

Level 13, 157 Walker Street North Sydney 2060 NSW Australia

The use of the Accreditation Mark indicates accreditation by the Joint Accreditation System of Australia and New Zealand in respect to those activities covered by JAS-ANZ accreditation. Refer to www.jas-anz.org/register for verification.

This certification remains valid until the above mentioned expiry date and subject to the organisation's continued compliance with the certification standard, and Global-Mark's Terms and Conditions.

This Certificate of Approval remains the property of Global-Mark Pty Ltd, Company Number: ACN.108-087-654

JAS-ANZ

Certification Manager

Unique Certificate Code: 5CC8906349 92E168CA25828300412EAC

Global-Mark Pty Ltd, Copyright 2005 - 407, 32 Delhi Road, North Ryde NSW 2113, Australia

APPENDIX 2: ENVIRONMENTAL POLICY

Environmental Policy

Taylor regards appropriate management of environmental issues as integral to our business. We are committed to the protection of the environment and ecologically sustainable practices in all aspects of our operations.

We will comply with all relevant legislation governing the protection of the environment. Our environmental management systems will address all aspects of the International Standard, ISO 14001:2016: "Environmental Management Systems – Requirements with guidance for use".

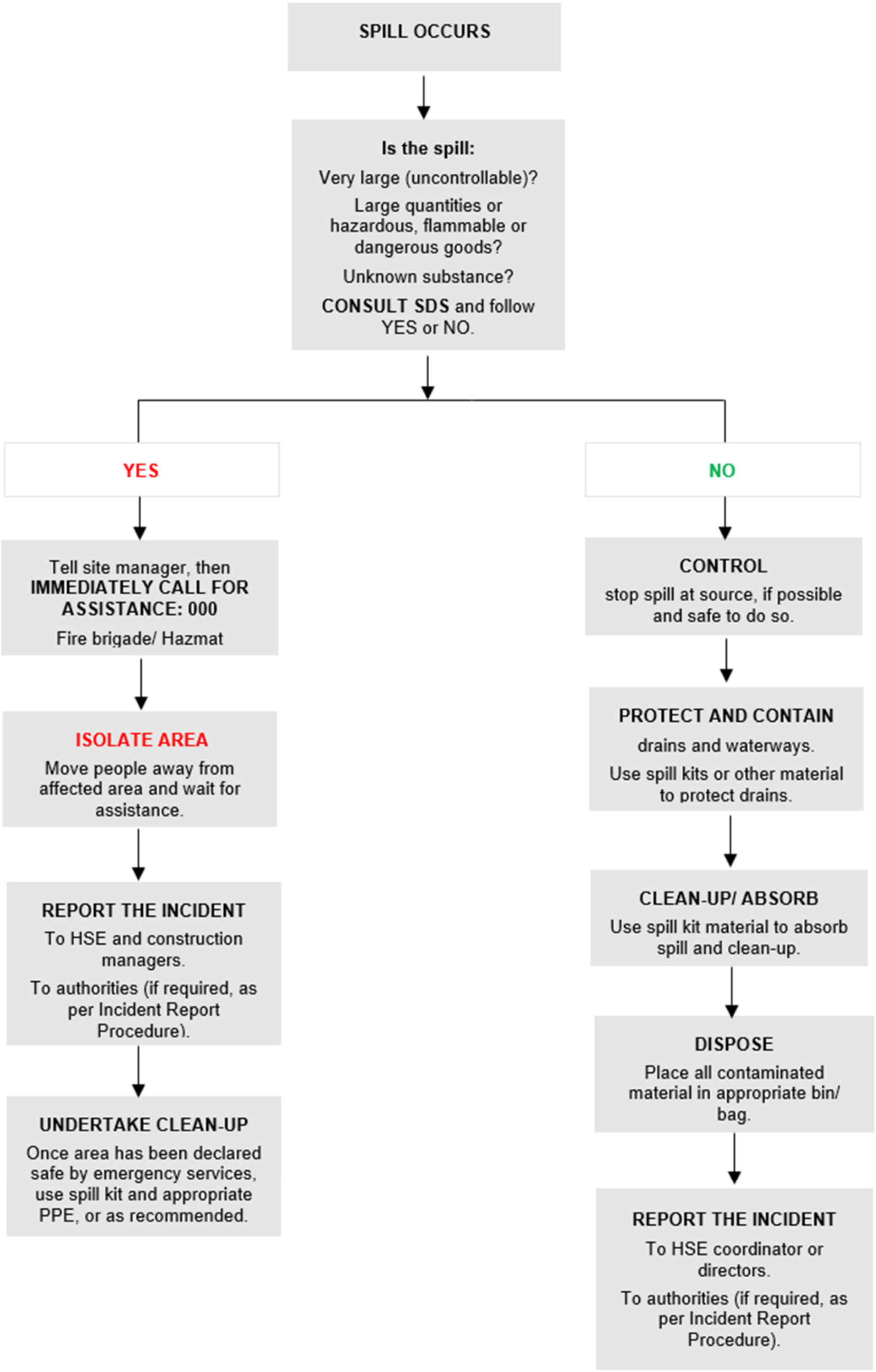
IN MANAGING OUR BUSINESS, WE MAKE A COMMITMENT TO:

- Work pro-actively with our clients, regulators, and other community stakeholders to enable environmental issues to be addressed at an early stage of development.
- Take local community views into consideration and ensure that we inform, listen to and respond to reasonable concerns relating to our projects.
- Undertake our activities in a manner that is consistent with the principles of ecologically sustainable development.
- Prevent pollution and reduce adverse environmental impacts of our activities on the natural, built and cultural environment.
- Promote the efficient use of natural resources and reduce waste through the use of the waste hierarchy –avoid, reduce, re-use, recycle and finally dispose.
- Set realistic environmental objectives and targets at all relevant levels within the company and continually monitor performance.
- Promote environmental awareness among all employees and subcontractors to achieve our environmental objectives.
- Continually improve our environmental performance through periodic review and evaluation of our policy and management systems to ensure they remain suitable, adequate and effective.
- Encourage a sense of personal responsibility for environmental issues amongst employees and subcontractors through effective communication, training and positive organisational culture.

This policy will be reviewed in December 2020.

Clive Wickham
Chief Operating Officer

APPENDIX 3: TAYLOR CONSTRUCTION SPILL RESPONSE PROCEDURE FLOW CHART



SPILL OCCURS

Is the spill:

Very large (uncontrollable)?

Large quantities or hazardous, flammable or dangerous goods?

Unknown substance?

CONSULT SDS and follow YES or NO.

YES

Tell site manager, then **IMMEDIATELY CALL FOR ASSISTANCE: 000**

Fire brigade/ Hazmat

ISOLATE AREA

Move people away from affected area and wait for assistance.

REPORT THE INCIDENT

To HSE and construction managers.

To authorities (if required, as per Incident Report Procedure).

UNDERTAKE CLEAN-UP

Once area has been declared safe by emergency services, use spill kit and appropriate PPE, or as recommended.

NO

CONTROL

stop spill at source, if possible and safe to do so.

PROTECT AND CONTAIN

drains and waterways.

Use spill kits or other material to protect drains.

CLEAN-UP/ ABSORB

Use spill kit material to absorb spill and clean-up.

DISPOSE

Place all contaminated material in appropriate bin/ bag.

REPORT THE INCIDENT

To HSE coordinator or directors.

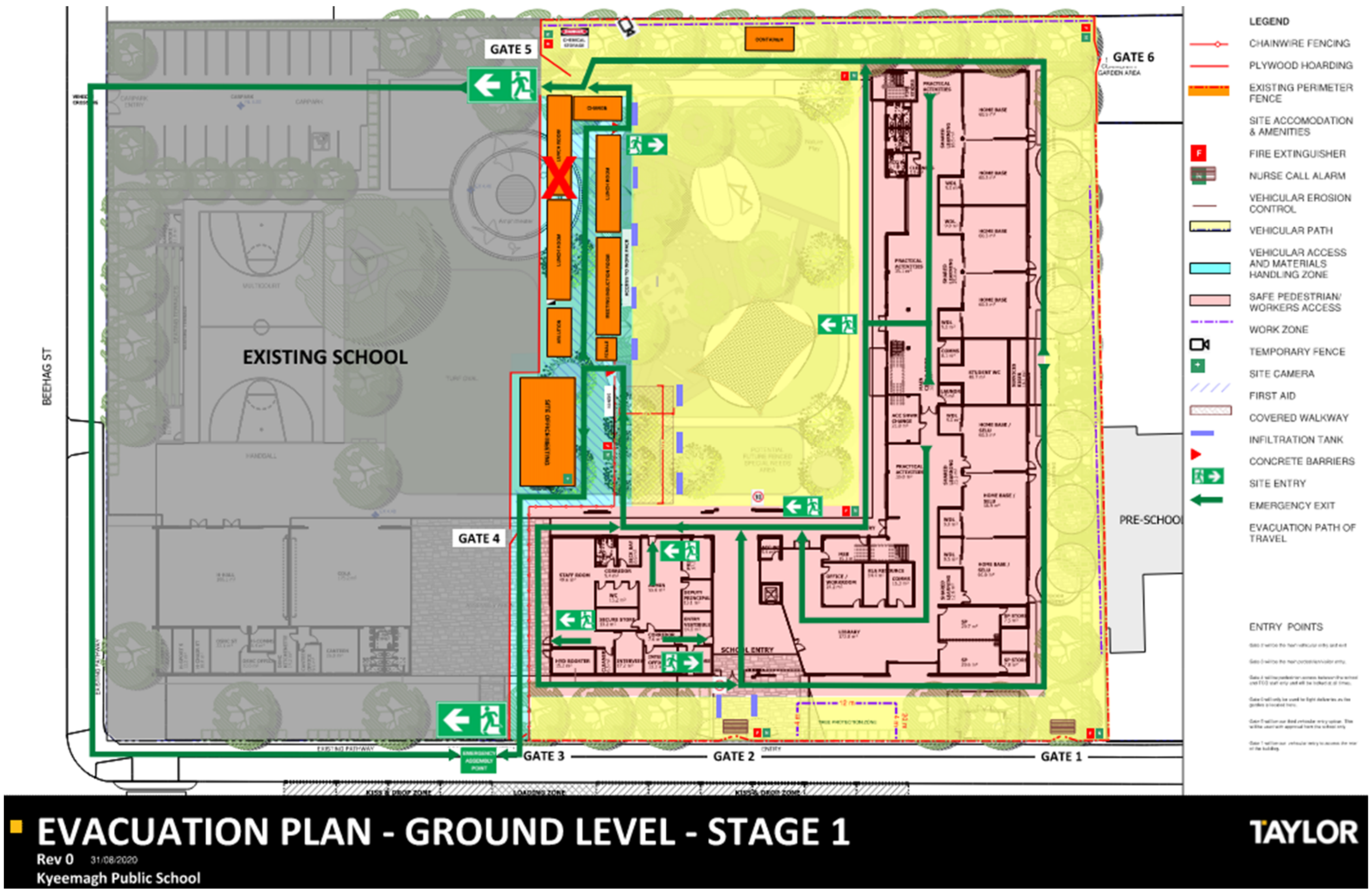
To authorities (if required, as per Incident Report Procedure).

APPENDIX 4: SITE ENVIRONMENTAL EMERGENCY RESPONSE PLANS

Potential emergency	What to do?	Relevant authorities and persons
Injury caused by: – Fire – Explosion – Machinery accidents – Minor injuries	• For serious injuries, call an ambulance. You should also have the contact details of the nearest doctor, medical centre and hospital; • Immediately inform the site first aid officer; • Follow the procedures as detailed in the Site Safety Plan; • For major injuries, contact the site manager or project manager.	Emergency services Nearest doctor Medical centre Site manager Project manager
Fire **Fire at the diesel tank** **Fire at any of the machineries** **Fire caused by vandalism**	• Evacuate all personnel to a safe area immediately; • Call the fire brigade (emergency services); • If the fire is likely to damage neighbouring property, inform the adjacent residents; • Follow the procedures as detailed in the Site Safety Plan; • For major fire emergencies, contact the site manager or project manager; • Inform terminal security. **Note**: fire extinguishers are located throughout the site as detailed in the Emergency Evacuation Map.	Emergency services Site manager Project manager Adjacent residents
Spills management and contaminated soils Major spills: • Spill or release of diesel fuel or oil; • Spill or release of other hazardous chemicals or material	For major spills (defined as a spill that is likely to have direct environmental consequences): • Immediately call the Fire Brigade and notify superintendent; • Identify the source of the spill; • Refer to the Material Safety Data Sheet (MSDS) and evaluate the hazards of the material.	Emergency services (fire brigade) HSE manager SM and PM EPA
Minor site spills **Acid sulphate soils**	• If the material is dangerous, evacuate the site immediately and notify all neighbours; • If it is safe to do so, halt the source of the spill immediately; • Contain the spill and control its flow; • Block storm water drains downstream of the spill; • EPA and local council must be notified about any spills that are likely to threaten the environment; • Minor spills (defined as spills which can be contained and rectified correctly without the need of external services), shall be contained and rectified with the site spill kit and disposed of correctly. Superintendent to be notified via incident report; • Reported to the site manager; • Where acid sulphate soils are discovered, the spoil shall not be removed from site; subsequent notification and testing will follow.	Emergency services (fire brigade) HSE manager SM and PM EPA
Heavy rainstorm and flood beyond the capacity of the sediment and erosion controls on-site or failure of the sedimentation control measures.	• Contain/ minimise the flow; • Contact council immediately; • Investigate reasons for failure and prepare an incident report; • Contact the project manager.	Council Site manager Project manager
Discovery of items of conservation value (e.g. flora and fauna, heritage).	Fence-off the area as 'no go' zone and contact the site manager or project manager immediately for further action.	Site manager Project manager
Discovery of contaminated material on site (e.g. underground fuel storage tanks).	Fence-off the area as 'no go' zone and contact the site manager or project manager immediately for further action.	Site manager Project manager

APPENDIX 5: SITE MAP – ENVIRONMENTAL REQUIREMENTS

NOTE: Insert here the site map with location of hazardous substances, dangerous goods, storm water drains, waterways, spill kits and other environmental requirements.



APPENDIX 6: ENVIRONMENTAL LEGAL AND OTHER REQUIREMENTS REGISTER

TAYLOR

Project : KYEEMAGH PUBLIC SCHOOL **Date: 17.07.20**

ENVIRONMENTAL -LEGAL -REGISTER -01

Environmental Legal Register

Legislation	*Key Requirements*	*Relevance to Taylor Construction Group*	*Mechanism for Evaluating Compliance*	*Link to legislation and relevant web sites*
Protection of the Environment Operations Act 1997 (POEO Act)	The POEO Act is the key piece of environment protection legislation, and is administered by the Department of Environment and Climate Change (DECC) – formerly EPA. The objective of the Act is to protect restore and enhance the quality of the environment in NSW with a need to maintain ecologically sustainable development. Schedule 1 of the POEO Act lists activities that are subject to environmental licensing. Where an environmental Protection Licence is required, the DECC is the Appropriate Regulatory Authority (ARA). In most other cases, the local council is the ARA.	Environmental Protection Licences may be required for large projects by TPG. (Refer to Schedule 1) Therefore, in most cases, the local council is the Appropriate Regulatory Authority . Environmental protection offences and penalties, and a duty to notify of environmental harm, apply to all personnel working on the project. Managers, supervisors, workers and contractors need to comply with all requirements of the Act, with particular emphasis on duty to notify, and prevention of pollution (see key sections in adjacent column to the left)	**Environmental inspections** **Compliance checks / audits against Environmental Management Plan**	www.austlii.edu.au/au/legis/nsw/consol_act/poteoa1997455/ http://www.environment.nsw.gov.au/licensing/
	The POEO Act imposes severe penalties for causing environmental harm, polluting water, not operating equipment in an efficient manner and inappropriate handling and disposal of waste. Penalties also exist for failure to notify pollution incidents.	The company and individuals can be prosecuted in criminal proceedings under this Act.	**Environmental inspections** **Plant pre-start inspections and plant maintenance** **Compliance checks / audits against Environmental Management Plan**	
	The following is a summary of key sections of the Act that must be complied with: ▪ S 120 – Prohibition of Water pollution ▪ S 124 - 125 Air pollution - failing to maintain and operate plant, or carry out maintenance work on plant, in a proper and efficient manner. ▪ S 128 Standard of air impurities not to be exceeded (air pollution) ▪ S 139 – Noise Pollution – operation of plant S 142 A-E – Land Pollution (offence if cause or permit land to be polluted		Environmental inspections Plant pre-start inspections and plant maintenance Compliance checks / audits against Project Environmental Management Plan	http://www.environment.nsw.gov.au/water/polltreatment.htm http://www.environment.nsw.gov.au/air/ http://www.environment.nsw.gov.au/noise/

TAYLOR

Project : KYEEMAGH PUBLIC SCHOOL **Date: 17.07.20**

ENVIRONMENTAL -LEGAL -REGISTER -01

Environmental Legal Register

Legislation	*Key Requirements*	*Relevance to Taylor Construction Group*	*Mechanism for Evaluating Compliance*	*Link to legislation and relevant web sites*
	S 143 – Land Pollution (unlawful transport of waste) S 144 – Land Pollution – permitting land to be used as unlawful waste facility	**Waste must be transported by an appropriately licenced transporter to a facility that is licenced to accept waste**		
	S 148 – Duty to Notify S 152 Offences for failure to notify of pollution incident	**Licenced disposal authority to provide reciepts for all waste received , reciept is to include date, time and amount of waste disposed , ALL reciepts MUST be provided to Taylors site management on their return to site or when requested**	**Environmental incident reports (indicating if notification was required). Reviewed at Management Review.**	
	Penalties **Most Serious Offences Causing Harm to the Environment and Involving Wilfulness or Negligence**	Damage to corporate reputation / image		
	Maximum penalty: Corporations $5,000,000 (wilful) or $2,000,000 (negligence): Individuals $1,000,000 or 7 years' imprisonment, or both, (wilful) or $500,000 or 4 years' imprisonment, or both (negligence)	**Possible exclusion from tendering for future environmental sensitive projects**	**Environmental inspections** **Plant pre-start inspections and plant maintenance** **Compliance checks / audits against Environmental Management Plan**	
	Tier 2 (strict liability) Corporations: $1,000,000 and up to $120,000 for each day the offence continues. Individuals: Up to $250,000 and up to $60,000 each day the offence continues. **Tier 3 (penalty notice – on the spot fine**) $1500 for corporation $750 for individuals **Failure to Notify a Pollution Inciden** Maximum penalty: corporations $1,000,000; individuals $250,000	**Financial Cost to company and project stake holders**	**Monitor compliance with DA concent**	

TAYLOR

Project : **KYEEMAGH PUBLIC SCHOOL** **Date: 17.07.20**

ENVIRONMENTAL -LEGAL -REGISTER -01

Environmental Legal Register

Legislation	***Key Requirements***	***Relevance to Taylor Construction Group***	***Mechanism for Evaluating Compliance***	***Link to legislation and relevant web sites***
POEO (General) Regulation 2009	The Regulation (among other things): • sets out fees for environment protection notices and noise control notices; • sets out matters to be included by the EPA in its statement of reasons for the grant or refusal of a licence application; • makes it an offence to provide false or misleading information in relation to a licence application; • requires licensees to retain records used to calculate licence fees; • prescribes certain matters when placed into water to be water pollution, and the methodology for testing matter in waters; • exempts certain water pollution from the water pollution offence under the *POEO Act 1997*; • allows the EPA to prohibit or regulate certain activities that threaten the safety of drinking water that is part of a public water supply; declares certain bodies to be the ARA in relation to certain activities for the purposes of the *POEO Act 1997*;	Projects may require environmental protection licences. (Refer to Schedule 1 of the POEO Act)	**Planning - requirement for Licence set out in PEMP (if required)** **Audits against PEMP**	https://www.google.com.au/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwiQq5ew4rzYAhWHE7wKHXjTDUUQFggnMAA&url=http%3A%2F%2Fwww.austlii.edu.au%2Fau%2Flegis%2Fnsw%2Fconsol_reg%2Fpoteor2009601%2F&usg=AOvVaw1RKZlXEv0dxWGfFhkVRVb3
POEO (Clean Air) Regulation 2010	**This Regulation replaces the *Clean Air (Domestic Solid Fuel Heaters) Regulation 1997, Clean Air (Motor Vehicles and Motor Vehicle Fuels) Regulation 1997, Clean Air (Plant and Equipment) Regulation 1997* and the *Protection of the Environment Operations (Control of Burning) Regulation 2000POEO (Clean Air) Regulation 2002***			http://www.austlii.edu.au/au/legis/nsw/consol_reg/poteoar2002601/

TAYLOR

Project : KYEEMAGH PUBLIC SCHOOL **Date: 17.07.20**

ENVIRONMENTAL -LEGAL -REGISTER -01

Environmental Legal Register

Legislation	*Key Requirements*	*Relevance to Taylor Construction Group*	*Mechanism for Evaluating Compliance*	*Link to legislation and relevant web sites*
	In relation to motor vehicles, the regulation deals with the emission of air impurities, including excessive smoke from motor vehicles. In relation to Plant and Equipment, the regulation sets maximum limits on emissions from activities and plant for a number of substances, including chlorine, dioxins furans, smoke, solid particles and sulphur. In relation to the control of burning, the regulation controls burning in the open or in incinerators in local government areas, prohibits the burning of certain articles (including tyres, paint and solvent containers, and certain treated timbers), and imposes a general duty on persons to prevent or minimise air pollution when burning in the open or in an incinerator	Keep vehicles maintained to minimise air pollution and avoid a "smoky vehicle" fine. Maintain plant and equipment to minimise air pollution General Policy at Taylor Construction Group is no burning off at site.	Environmental Inspection checklist Pre-start checks on plant	http://www.legislation.nsw.gov.au/fragview/inforce/subordleg+428+2010+whole+0+N?tocnav=y
POEO (Noise Control) Regulation 2008	This Regulation repeals and remakes, with minor amendments, the provisions of the Protection of the Environment Operations (Noise Control) Regulation 2000: • the sounding of sirens and similar devices and the use of sound systems on vessels, • the emission of noise from the engines or exhausts of motor vehicles and vessels, • the maintenance of noise control equipment on motor vehicles and vessels, • the issue of defective vehicle notices and defective vessel notices, • the times during which it is not permissible to use certain articles if they emit noise that can be heard in any residential premises, • the inspection and testing procedures for the purpose of determining noise emission levels of certai motor vehicles, motor vehicle accessories, vessels, articles or equipment	**Noise emissions from machinery and activities.**	**Environmental Inspection checklist** **Pre-start checks on plant**	www.austlii.edu.au/au/legis/nsw/consol_reg/poteocr2008693/ http://www.environment.nsw.gov.au/noise/
POEO (Penalty Notices) Regulation 2004	This Regulation: • sets out the offences under the*Protection of the Environment Operations Act 1997* and related Acts and regulations for which penalty notices may be issued, and the amount of such fines;	Environmental protection offences and penalties, and a duty to notify of environmental harm, apply to all personnel working on projects.		www.austlii.edu.au/au/legis/nsw/consol_reg/poteonr2004710/

Legislation	***Key Requirements***	***Relevance to Taylor Construction Group***	***Mechanism for Evaluating Compliance***	***Link to legislation and relevant web sites***
	• specifies the organisations authorised to issue penalty notices for particular offences; anc • authorises the service of a penalty notice relating to an offence, applying to an owner of a motor vehicle or vessel, on the owner without naming the address of the owner and by leaving the penalty notice on that vehicle or vessel.			
POEO (Waste) Regulation 2005	Schedule 1 of the regulation sets out the types of waste to which waste tracking requirements apply.	Certain chemicals used or generated may be subject to tracking requirements in this regulation. If waste tracking requirements apply, waste dockets and other records must be kept	**Periodic (monthly) review of project waste dockets and records to ensure compliance with tracking requirements.**	http://www.austlii.edu.au/au/legis/nsw/consol_reg/poteor2005609/
Protection of the Environment Operations Amendment (Scheduled Activities and Waste) Regulation 2008 (Note – part of 2005 Regulation)	**This framework uses a mix of legislative, policy, educative and economic tools to encourage waste avoidance and the further recovery of resources. This new framework includes:** • **Fewer and simpler licensing categories for waste;** • A streamlined waste classification system; • **New resource recovery licensing categories and resource recovery exemptions; and** • **Clearer requirements for managing asbestos and clinical waste.** **The waste regulatory framework is administered under the principal legislation of the Protection of the Environment Operations Act 1997 and the Waste Avoidance and Resource Recovery Act 2001.**	Altered definitions of waste categories and disposal requirements (since April 2008). If using recovered resources (eg recycled asphalt, etc), ensure material meets threshold contaminant requirements (obtain from supplier prior to use) includes 2011 amendment		www.environment.nsw.gov.au/waste www.austlii.edu.au/au/legis/nsw/consol_reg/poteor2005609/ http://www.environment.nsw.gov.au/waste/classification.htm http://www.environment.nsw.gov.au/waste/RRecoveryExemptions.htm http://www.legislation.nsw.gov.au/sessionalview/sessional/subordleg/2011-151.pdf
Protection of the Environment Operations (Underground Petroleum Storage Systems Regulation 2008)	Regulation requires that underground petroleum storage tanks must not be commissioned unless it has been properly designed, installed and equiped, and integrity test performed.	The regulation generally will only apply to TPG if it owns or operates sites with Underground Petroleum Storage Systems (UPSSs).	If UPSSs are owned or operated by TCG, extensive monitoring would be required in accordance with an Environmental Protection Plan specifically relating to the tank. Periodic evaluations would be conducted agains the Plan.	www.austlii.edu.au/au/legis/nsw/consol_reg/poteopssr2008983/

TAYLOR

Project : KYEEMAGH PUBLIC SCHOOL Date: 17.07.20

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Environmental Legal Register

Legislation	***Key Requirements***	***Relevance to Taylor Construction Group***	***Mechanism for Evaluating Compliance***	***Link to legislation and relevant web sites***
	A storage system must not be used unless groundwater monitoring wells are installed on the storage site and these are not to be installed unless properly designed. The storage system must not be used unless an environment protection plan is in place and must be used in accordance with that plan. (for detail, of plan requirements refer to clause 19) Note - this requirement will apply to old tanks from June 2009. Groundwater monitoring requirements on old storage tanks will come be required from June 2011 (Clause 21) Loss detection procedures must be in place and acted upon if any loss is detected (clause 22) Records must be kept for at least 7 years	When working on sites with UPSTs, ensure location is known, and that client can provide details on locations of groundwater monitoring wells, and other required information		http://www.environment.nsw.gov.au/clm/upss.htm
Contaminated Land Management Act 1997 *Contaminated Land Management Amendment Act 2008*	The main objective of this Act is to establish a process for investigating and remediating land areas where contamination presents a significant risk of harm to human health or some other aspect of the environment. The amendment Act strengthens EPA/DECC powers in relation to contaminated land. Under this act DECC has the power to: • Declare an investigation site and order and investigation • Declare a remediation site and order remediation to take place • Agree to a voluntary proposal to investigate or remediate a site	Environmental Hygienist may be engaged to provide advice , reports and monitor activities when undertaking work on contaminated sites is required .	**If contaminated land is likely to be encountered, measures for testing, handling and disposing of contaminated spoil are in the Project Environmental Management Plan. Testing is undertaken to ensure compliance.**	http://www.austlii.edu.au/au/legis/nsw/consol_act/clma1997238/ http://www.austlii.edu.au/au/legis/nsw/consol_act/clmaa2008318/sch1.html http://www.environment.nsw.gov.au/clm/
Contaminated Land Management Regulation 2008	This Regulation prescribes a number of matters for the purposes of the *Contaminated Land Management Act 1997* , including: • the content of site auditors' annual returns; • the form to be used when reporting contamination; and • the amount which the EPA may recover for its costs incurred in relation to investigation and remediation orders.	Minimal relevance.	N/A	http://www.austlii.edu.au/au/legis/nsw/consol_reg/clmr2008329/

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Project : **KYEEMAGH PUBLIC SCHOOL** **Date: 17.07.20**

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Environmental Legal Register

Legislation	Key Requirements	Relevance to Taylor Construction Group	Mechanism for Evaluating Compliance	Link to legislation and relevant web sites
Environmentally Hazardous Chemicals Act 1985	The purpose of this Act is to control chemicals that are environmentally hazardous. DECC may make chemical control orders (CCOs) with respect to assessed chemicals or declared chemical wastes. The CCOs may regulate the manufacture, processing, conveying, buying, selling or disposal of chemical or declared waste. A CCO may prohibit activities in relation to declared chemical wastes, except under the authority of a licence issued by DECC.	Certain chemicals used or generated may be subject to handling and disposal requirements in this Act. Chemicals subject to this Act include Dioxin wastes, Asbestos wastes, PCBs, and organochlorine pesticide wastes. It is unlikely that Taylor Construction Group activities would generate hazardous wastes covered by a CCO	**Measures for identification, handling, disposal of hazardous wastes are in the Project Environmental Management Plan .**	http://www.austlii.edu.au/au/legis/nsw/consol_act/ehca1985373/
Environmentally Hazardous Chemicals Regulation 2008	This Regulation: • sets various fees in relation to assessments of technology and prescribed activities by the EPA and in relation to licences to carry on prescribed activities; • specifies the matters to be included in applications for assessment of prescribed activities, in EPA notices about assessments of chemicals, and in EPA notices about applications for licences and transfers of licences; • prescribes the information to be included in registers under the Act.	No relevance.		
Pesticides Act 1999	This Act promotes the protection of human health, environment, property and trade in relation to the use of pesticides. It is an offence under the Act to: • Use a pesticide that harms or damages a person or property, a non-target animal or plant; • Use a pesticide that harms a threatened specie or protected animal; • Possess or use an unregistered pesticide without a permit, or contrary to the approved label; • Fail to comply with the label or permit while using a pesticide;	Generally pest control would be undertaken by specialist contractors. If pesticides are applied by TPG personnel, stringent storage, handling and record keeping requirements apply. Refer to the full Act and Regulations	**If pesticides are used, the requirements would be documented in the Project Environmental Management Plan for the project. Regular audits would be undertaken against the Plan, and pesticide records would be reviewed once monthly by the project manager.**	www.austlii.edu.au/au/legis/nsw/consol_act/pa1999120/ http://www.environment.nsw.gov.au/pesticides/

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Environmental Legal Register

Legislation	***Key Requirements***	***Relevance to Taylor Construction Group***	***Mechanism for Evaluating Compliance***	***Link to legislation and relevant web sites***
	• Keep a registered pesticide in a container without a label; • Possess or use a restricted pesticide without authorisation. DECC may make pesticide control orders which prohibit use or possession of restricted pesticides			
Pesticides Regulation 1995	This regulation requires that any person or organisation applying a chemical in a public place must apply this chemical as described in their Notification Plan for Pesticide Use in Public Places. The regulation makes it compulsory for all people who use pesticides for commercial or occupational purposes to make a record of their pesticide use.	As above	As above	www.austlii.edu.au/au/legis/nsw/consol_reg/pr1995211/
Environmental Planning and Assessment Act 1979 **(EP&A Act)**	The main objective of the EP&A Act is to ensure that proper management and development of land is undertaken incorporating the ecologically sustainable development principles. To achieve this the EP&A Act: • Ensures that development consent is obtained prior to construction; • Ensures compliance with planning consents and conditions associated with the consent • Ensures environmental assessment is undertaken prior to development consent • Has provision for penalties to be issued should development conditions be breached Also has Planning instruments such as Local Environmental Plans (LEPs)	Development Approval / Consent required prior to construction as per EP&A Act and as detailed in LEPs. Need to comply with Conditions of Consent once granted	**Compliance audits / checks against development consent conditions (likely to be done by client)**	www.austlii.edu.au/au/legis/nsw/consol_act/epaaa1979389/
Fisheries Management Act 1994	The primary aim of this Act is to conserve, develop and share fisheries resources of NSW to benefit present and future generations. To do this the Act: • Provides Fishery Management Strategies for commercial and recreational purposes • **Protects marine flora and fauna (eg. Mangroves);** • Describes dredging and reclamation approval process;	The Act applies to works that involve dredging or working in water bodies including estuaries, lakes, intertidal zones etc.:	**If dredging or other activities in fisheries are undertaken, the requirements would be documented in the Project Environmental Management Plan for the project. Regular audits would be undertaken against the Plan.**	www.austlii.edu.au/au/legis/nsw/consol_act/fma1994193/

Legislation	*Key Requirements*	*Relevance to Taylor Construction Group*	*Mechanism for Evaluating Compliance*	*Link to legislation and relevant web sites*
	• Prevents the sale or possession of noxious fish and marine vegetation; • Has provision for penalties to be issued for breaches of the requirements of this Act.			
Marine Pollution Act 1987 ***Marine Pollution Regulation 2006***	This Act and the *Marine Pollution Amendment Regulation 2006* oblige marine operations to • Prevent pollution of marine environment by spillages from ships and transfer operations • Report/record oil or noxious liquid discharges from ships. Schedule 4 of the regulation provides Standards for treated sewage from vessels (faecal coliform, suspended solids and BOD)	Relevant only when dredging or working in a marine environment.	**If dredging or work in the marine environment is anticipated, the measures for monitoring compliance will be documented in the Project Environmental Management Plan.**	http://www.austlii.edu.au/au/legis/nsw/consol_act/mpa1987200/
Waste Avoidance and Resource Recovery Act 2001	This Act promotes waste avoidance and resource recovery by: • Encouraging efficient use of resources in accord with ecologically sustainable principles; • Promoting the "Avoid, reuse, recycle, dispose" hierarchy; • Ensuring industry has a responsibility for reducing and dealing with waste • Providing penalties for breaches of this Act	Waste is generated during construction. The principles of the Act are applied to all aspects of construction to reduce impacts from waste. A Waste Management Plan may be required to be prepared as part of conditions of consent.	**Regular environmental inspections using standard checklist** **Audit against Waste Management Plan (if applicable) or against Project Environmental Management Plan**	www.austlii.edu.au/au/legis/nsw/consol_act/waarra2001364/ http://www.environment.nsw.gov.au/waste/
Threatened Species Conservation Act 1995	This Act outlines the protection of threatened species, communities and critical habitat. An independent Scientific Committee determines which species, populations and ecological communities should to be listed as endangered, vulnerable or extinct, and also determines key threatening processes. Any animal, plant or habitat that is listed as endangered, vulnerable or threatened must not be harmed or damaged, unless planning approvals or licences from DECC have been granted.	Construction activities may be undertaken in areas where threatened species, communities and critical habitat exit. The presence of these should be identified by the Environmental Impact Assessment process prior to construction – usually identified by the client	**If threatened species have been identified in the Environmental Impact Assessment (usually by client), the requirements would be documented in the Project Environmental Management Plan for the project. Regular audits would be undertaken against the Plan.**	www.austlii.edu.au/au/legis/nsw/consol_act/tsca1995323/ http://www.environment.nsw.gov.au/threatenedspecies/
Native Vegetation Act 2003	This Act regulates the clearing of native vegetation on all land in NSW except for National Parks, State Forests and reserves and urban areas. Native vegetation is any species of vegetation that existed in	Approval is generally required for clearing native vegetation, although some exceptions apply.		www.austlii.edu.au/au/legis/nsw/consol_act/nva2003194/ http://www.environment.nsw.gov.au/vegetation/

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ENVIRONMENTAL -LEGAL -REGISTER -01

Environmental Legal Register

Legislation	*Key Requirements*	*Relevance to Taylor Construction Group*	*Mechanism for Evaluating Compliance*	*Link to legislation and relevant web sites*
Noxious Weeds Act 1993	This Act requires occupiers of land to control noxious weeds required under control categories specified in relation to the weeds concerned. There are five classes of noxious weeds: Class 1 – State Prohibited Weeds: must not be introduced/become established in NSW; Class 2 – Regionally Prohibited Weeds: must not be introduced or become established in parts of NSW; Class 3 – Regionally Controlled Weeds: area that these weeds occupy must be reduced; Class 4 – Locally Controlled Weeds: impact on economy, community, environment must be minimised; Class 5 – Restricted Plants: must not be introduced or allowed to spread from current areas. Notices ordering the eradication of a classified weed may be served.	Classified weeds that are present on project sites or establish themselves during construction must be eradicated.	**If noxious weeds are present, regular inspections should be carried out as part of the environmental inspection process**	www.austlii.edu.au/au/legis/nsw/consol_act/nwa1993182/ http://www.environment.nsw.gov.au/pestsweeds/
National Parks and Wildlife Act 1974	Under this Act, NPWS is responsible for the care, control and management of all national parks, historic sites, nature reserves, reserves, Aboriginal areas and state game reserves. The Act governs various activities including: • Protection of flora and fauna • Protection of Aboriginal heritage • Licences and approvals to modify or destroy flora, fauna or Aboriginal heritage • Penalties for breaches of the Act.	Relates to any Aboriginal heritage or relics, and protection of flora and fauna.	**If works are undertaken in areas with potential Aboriginal Heritage, These should be identified in the Environmental Impact Assessment and related documents, and incorporated into the PEMP. Regular inspections and audits would be undertaken to ensure compliance.**	www.austlii.edu.au/au/legis/nsw/consol_act/npawa1974247/ http://www.environment.nsw.gov.au/licences/
	An Aboriginal Heritage Impact Permit (AHIP) is required for any activity likely to have an impact on Aboriginal objects or places.			http://www.environment.nsw.gov.au/nswcultureheritage/dec_consultation_080103_ReviewInterimRequirementsForAHIP.htm
National Parks and Wildlife Regulation 2002	This regulation governs various activities under the *National Parks and Wildlife Act 1974* , including:	Relates to any Aboriginal heritage or relics, and protection of flora and fauna.	If works are undertaken in areas with potential Aboriginal Heritage, These should be identified in the Environmental Impact Assessment and related documents, and incorporated into the PEMP. Regular inspections and audits would be undertaken to ensure compliance.	www.austlii.edu.au/au/legis/nsw/consol_reg/npawr2002338/

Environmental Legal Register

Legislation	*Key Requirements*	*Relevance to Taylor Construction Group*	*Mechanism for Evaluating Compliance*	*Link to legislation and relevant web sites*
	• the regulation of the use of national parks and other areas administered by the NPWS (Part 2) • the preservation of public health in Kosciuszko National Park (Part 3) • licences and certificates (Part 4) • the protection of fauna (Part 5) The regulation replaces the former NPW (Land Management) Regulation 1995, the NPW (Administration) Regulation 1995 and the NPW (Fauna Protection) Regulation 2001.			
Heritage Act 1977	The Heritage Act protects NSW's natural and cultural heritage including archaeological remains. If a site or place is of great significance, the Heritage Council can list it on the State Heritage Register. Items listed on the State Heritage Register are subject to the provisions of the *Heritage Act 1977*, which protects items of State heritage significance. Items 50 years or older are also considered heritage items and need to be managed as such. The Act prohibits the demolition, damage or development of or around any heritage item without approval from the Heritage Office.	Requirements will be triggered if there are natural or culturally significant sites or places. These should be identified through the Environmental Impact Assessment (EIA) process (eg – EIA, REF)	**If works are undertaken in areas with potential European Heritage, these should be identified in the Environmental Impact Assessment and related documents, and incorporated into the PEMP. Regular inspections and audits would be undertaken to ensure compliance.**	http://www.austlii.edu.au/au/legis/nsw/consol_act/ha197786/
Heritage Regulations 2005	The Heritage Regulation 2005: • restates the minimum standards for the maintenance and repair of items on the State Heritage Register set in the previous regulation; and • provides for equitable and adequate funding for heritage protection through cost recovery for statutory processing..	Minimal relevance.		
Water Act 1912	An Act consolidating water rights, water and drainage and artesian wells. Provisions include: • To obtain a licence to sink or alter an artesian bore; • Not to waste water taken from dams, lakes, artesian wells and bores • Not to unlawfully interfere with sub-surface water or obstruct its flow.	Minimal relevance.	N/A	

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Environmental Legal Register

Legislation	***Key Requirements***	***Relevance to Taylor Construction Group***	***Mechanism for Evaluating Compliance***	***Link to legislation and relevant web sites***
Water Management Act 2000 and Water Management (General) Regulation 2004	The *Water Management Act 2000* is the main piece of water legislation in NSW and governs: • Extraction of water from waterways and bores • The construction of water storage and supply structures • Development or building within the proximity of waterways • A licensing system established under the *Water Management Act 2000* allows for regulated usage o water resources The WMA Act consolidates the Water Act 1912 and the Rivers and Foreshores Improvement Act 1948.	Approvals may be required to undertake water supply works, drainage works or floodplain works	**If water is extracted from waterways, this would be addressed in the EIA and PEMP. Audits of the PEMP would be undertaken to determine compliance**	http://www.austlii.edu.au/au/legis/nsw/consol_act/wma2000166/
Rivers & Foreshore Improvement Act 1948	*This Act has been repealed and is replaced by the Water Management Act 2000*	Nil - repealed	N/A	
Commonwealth Legal Requirements				
Environment Protection and Biodiversity Conservation Act 1999 ***(Commonwealth Act)*** (EPBC Act)	This Act aims to protect the environment, particularly matters of National Environmental Significance. Approval is required for actions that are likely to have significant impact on: • a matter of national environmental significance; • environment of Commonwealth land (even if taken outside Commonwealth land); • environment anywhere in the world if the action is undertaken by the Commonwealth. Permits are required under the EPBC Act for: • certain activities in Commonwealth reserves; • activities that affect listed species or communities in Commonwealth areas; cetaceans in Commonwealth waters and outside Australian waters; • the import and export of wildlife.	Approvals may be required when working in areas that may have matters with national significance. Examples may include: * Work on Commonwealth land that may have a significant impact on the environment Working in areas that are listed as: *World Heritage property * National Heritage places * Listed wetlands (Ramsar) * Threatened species or communities * Migratory species * Nuclear actions * Marine Environments	**Specific requirements for complianceshould be addressed in Environmental Impact assessments and Project Environmental Management Plans. Audits and inspections would be undertaken against the stated requirements.**	http://www.austlii.edu.au/au/legis/cth/consol_act/epabca1999588/

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Environmental Legal Register

Legislation	*Key Requirements*	*Relevance to Taylor Construction Group*	*Mechanism for Evaluating Compliance*	*Link to legislation and relevant web sites*
	The Act contains compliance and enforcement mechanisms such as court injunctions, required environmental audits, strict civil and criminal penalties, remediation of environmental damage, liability of executive officers, and publicising contraventions.			
Other Requirements				
NSW Environmental Management System Guidelines Edition 2, 2007	The guidelines are published by the NSW Government to provide a framework for managing evnironmental issues on construction sites	Taylor Construction Group is seeking to gain accreditation to the NSW EMS Guidelines. The Integrated HSE management system and the Project Environmental Management Plan templates have been designed and prepared to meet these requirements		

** Note: This Legal Register provides guidance on the applicability of certain Environmental Acts and Regulations at Taylor Construction Group and should not be seen as legal advice. Should legal advice be required, appropriate legal firms should be engaged.*

APPENDIX 7: PLANNING SECRETARY INCIDENT NOTIFICATION

WRITTEN INCIDENT NOTIFICATION AND REPORTING REQUIREMENTS

Written Incident Notification Requirements

1. A written incident notification addressing the requirements set out below must be emailed to the Planning Secretary at the following address: compliance@planning.nsw.gov.au within seven days after the Applicant becomes aware of an incident. Notification is required to be given under this condition A35 even if the Applicant fails to give the notification required under condition or, having given such notification, subsequently forms the view that an incident has not occurred.

2. Written notification of an incident must:

   a. identify the development and application number;

   b. provide details of the incident (date, time, location, a brief description of what occurred and why it is classified as an incident);

   c. identify how the incident was detected;

   d. identify when the applicant became aware of the incident;

   e. identify any actual or potential non-compliance with conditions of consent;

   f. describe what immediate steps were taken in relation to the incident;

   g. identify further action(s) that will be taken in relation to the incident; and

   h. identify a project contact for further communication regarding the incident.

3. Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Planning Secretary, the Applicant must provide the Planning Secretary and any relevant public authorities (as determined by the Planning Secretary) with a detailed report on the incident addressing all requirements below, and such further reports as may be requested.

   4. The Incident Report must include:

   a. a summary of the incident;

   b. outcomes of an incident investigation, including identification of the cause of the incident;

   c. details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence; and

   d. details of any communication with other stakeholders regarding the incident.

APPENDIX 8: CONSTRUCTION TRAFFIC & PEDESTRIAN SUB PLAN

CONSTRUCTION TRAFFIC & PEDESTRIAN MANAGEMENT SUB PLAN

Project:	Taylors Construction – Kyeemagh Public School Upgrade
Project Job Number:	
Project Address:	30A Jacobson Avenue & Beehag Street, Kyeemagh
Proposed Work:	Construction of new C14 Primary School
Project Duration:	80 Weeks
Prepared for:	Taylors Construction
Prepared by:	Bridget Diggins – Secure Traffic Solutions
Authors Accreditation:	0051906031
Date:	23/06/2020

CONTROL SHEET – SUMMARY UPDATES

1. Insert new or revised sheets into the section of the TMP and remove/destroy any superseded sheets
2. Record revision, date and brief description immediately after the TMP is updated
3.

Revision	Date	Brief description of update
0/1	14th JULY 2020	Initial draft to Taylor Construction Group
0/2	17th July 2020	Amendments to CTPMSP
0/3	22th July 2020	Submission to Bayside Council
0/4	28th July 2020	Submission to Transit Systems
0/5	28th July 2020	Submission to Transport Management Centre
0/6	29th July 2020	Amendment – Resume/Consultation records
0/7	17th Sept 2020	Amendment – TfNSW/Consultation records

TMP INDEX

1 PROJECT DETAILS

1.1 Proposed Works

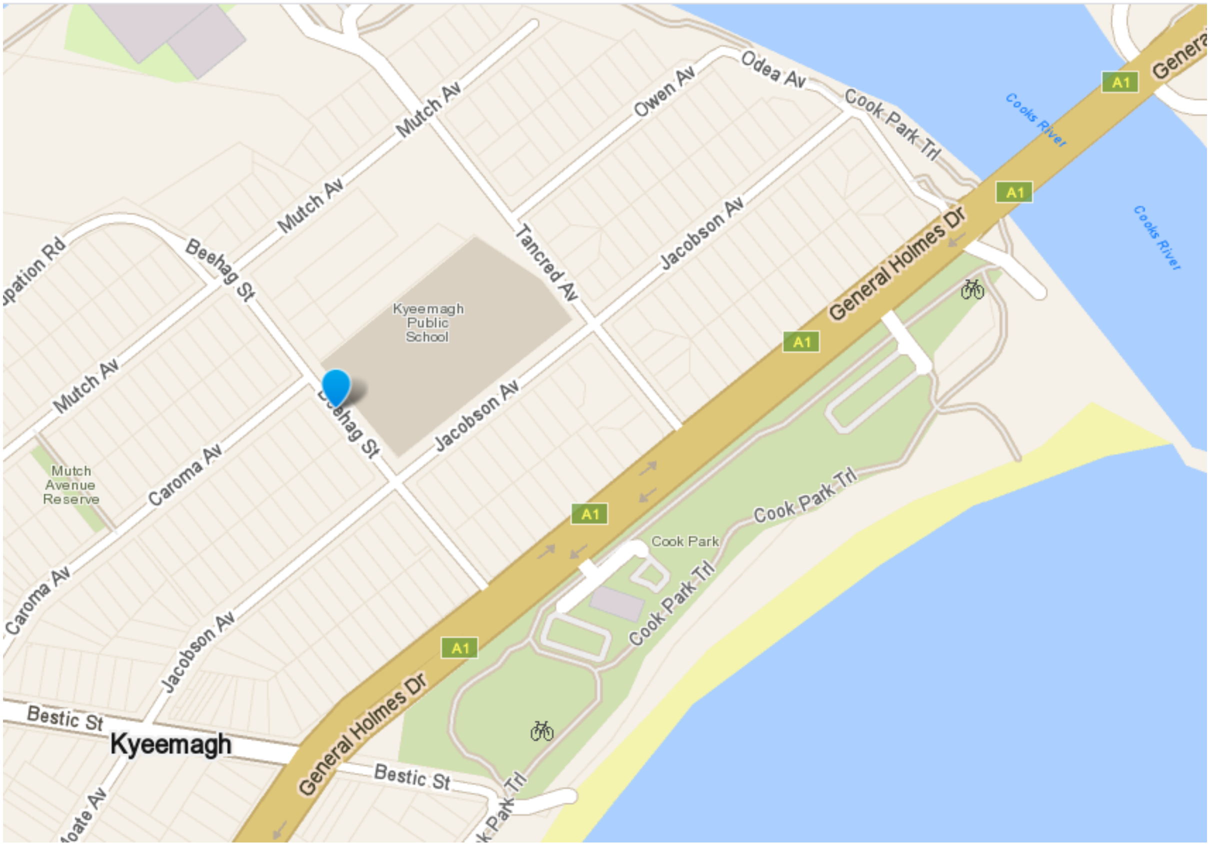
The development is contained primarily to upgrade Kyeemagh Public School. The project will see new improved facilities and support the growing community by providing:

- New 2 storey teaching spaces and associated amenities
- New library
- New administration building
- New COLA
- New Hall
- New playing space, car park and all external works as documented
- Demolition of all existing buildings

1.2 **Site Location**

The Construction site is located at 30A Jacobson Avenue & Beehag Street, Kyeemagh which is located 12 Kilometres south of Sydney CBD west of Botany Bay. Kyeemagh is in the local government area of Bayside Council

Key roads that provide access to and from the site are M5 Motorway/M1 Motorway, General Homes Drive, Bestic Street, Mutch Avenue (Local Road) Beehag Street (Local Road) Jacobson Avenue (Local Road) and Tancred Avenue (Local Road)



Beehag Street is a local unclassified road under the care and maintenance of the council. It runs in a north-south alignment between General Homes Drive and Mutch Avenue. The road is configured as a two way undivided carriageway (one lane in either direction). Unrestricted kerbside parking is available along the road. Beehag Street also has a school zone restriction where the speed limit is 40k from 8am-9.30am and from 2.30pm – 4pm Monday to Friday.

Jacobson Avenue is a local unclassified road under the care and maintenance of the council. It runs in a east-west alignment between Owen Avenue and Bastic Street. The road is configured as a two way undivided carriageway (one lane in either direction). Unrestricted kerbside parking is available along the road. Jacobson Avenue also has a school zone restriction where the speed limit is 40k from 8am-9.30am and from 2.30pm – 4pm Monday to Friday.

Mutch Avenue is a local unclassified road under the care and maintenance of the council. It runs in a east-west alignment. The road is configured as a two way undivided carriageway (one lane in either direction). Unrestricted kerbside parking is available along the road. The speed limit is 50k.

Tancred Avenue is a local unclassified road under the care and maintenance of the council. It runs in a north-south alignment between Mutch Avenue and General Homes Drive. The road is configured as a two way undivided carriageway (one lane in either direction). Unrestricted kerbside parking is available along both sides of the road.

1.3 **Purpose**

The purpose of this Traffic Management Plan is to show how Taylors proposes to manage safety in regards to traffic during demolition, evacuation and construction, to meet the requirements of Council and RMS. This TMP is prepared for the purpose to consider the safety of construction site personnel, neighbours, road users and pedestrians. The purpose of this report is to detail traffic management for each stage and seeks to minimise the impact on public amenities and ensure safe practice in accordance with RMS Guidelines.

It is expected that this plan will be updated should any necessary changes to the currently proposed arrangements arise in the future.

1.4 **Scope**

The scope includes the provision for the:

- safe movement of vehicular and pedestrian traffic,
- protection of workers on the site and from passing traffic,
- provision for access to the property for delivery of materials and movement of work vehicles located within the limits of the project,
- design, construction, maintenance and removal of any necessary temporary roadways and detours,
- provision of traffic controllers,

- Installation of temporary signs, road markings, lighting and safety barriers.
- Proposed protection of pedestrians adjacent to the site.

It also covers excavation and reconstruction with best route or road corridor for all work activities, including the existing road and road shoulder that may be used for the temporary diversion of traffic, over the duration of the project.

1.5 **Plan Objective**

The key objectives of this Traffic Management Plan ("TMP") are :

- To satisfy the key legal requirements related to Traffic, Transport and Access to site
- So that the information can be applied to the planning and implementation of traffic control plans.
- To ensure the safety of its employees, contractors, the public,
- To maximise the value and outcomes of traffic monitoring activities
- To ensure no injuries or property damage to persons or their property on or surrounding the project.
- To actively monitor traffic impacts related to the demolition and construction works on surrounding area
- RTA personnel, pedestrians, cyclists and traffic,
- Minimise delays to traffic and consider the needs of all road users
- Maintain satisfactory property access,
- Minimise disruption to businesses,
- Minimise disturbance to the environment,
- To ensure compliance with relevant specifications and the RMS's – Traffic Control at Work Sites Handbook Version 4
- To guide drivers through changed conditions guide them around the work site.

2 CONSTRUCTION

2.1 . Construction Activity

Major activities associated with the construction will include (in approximate order of occurrence):

Phase	**Activity**
Phase 1	- Site establishment, hoarding erection, fencing, scaffolding pedestrian control etc - Decommissioning of existing services - Demolition of existing structures on the site. - 16-24 trucks per day for Demolition
Phase 2	- Bulk Excavation - Services diversions (as applicable) - 4-6 truck per day for Excavation
Phase 3	- Crane Erection, construction of new buildings including Concrete boom pump concrete deliveries. - Concrete pours only 4 times during the project - Up to 30 trucks per day
Phase 4	- Mobile cranes, material deliveries - 4-6 trucks per day

During construction activities on the Kyeemagh site, the school will still be in operation. Vehicles entering/exiting will be escorted by traffic controllers to provide extra safety. Residents shall be advised of demolition, excavation, and construction activities.

Building operations such as brick cutting, washing tools or brushes and mixing mortar shall not be carried out on public roadways or footpaths or in any locations which could lead to the discharge of materials into the storm water drainage system.

All building materials and any other items associated with the development shall be stored within the confines of the property. No materials shall be stored on Council's footpath, nature strip, or road reserve without prior Council approval.

2.2. Site Working Hours

Monday – Friday 7am – 5pm
Saturday: - 8am – 1pm
No work permitted on Sunday or Public holidays.
Remediation works may require additional hours on a Saturday subject to authorisation.

No deliveries between 8am – 9.15am and between 2.30am and 3.30pm. For all deliveries contact Taylors site management Steve Ziaziaris 0413 182 641. A two-way system with a UHF channel to be nominated to assist in accepting deliveries.

Rock breaking, rock hammering, sheet piling, pile driving, and similar activities may only be carried out between the following hours:

(a) 7am – 5 pm, Monday to Friday
(b) 8am to 1pm, Saturday

Noise from construction activities shall comply with the Protection of the Environmental Operations (Noise Control) Regulation 2000.

2.3 Works / Loading Zones

All works associated with this development shall take place onsite, and separate Council / RMS approved works zone applications are not required.

2.4 Construction Vehicles movement/Work Zones

Adequate advanced warning and directional signage will be placed around the site. This will direct drivers to the construction site and inform other drivers and pedestrians of upcoming works on their route. Authorised Traffic Controllers shall be on-site ensuring controlled entry and exit in and out of site. This shall ensure movements shall not affect traffic flow or endanger pedestrians, by giving way to pedestrians and cyclists before trucks enter and exit site.

All truck movements shall be carried out taking into consideration the surrounding building and roads. Adequate measures to reduce severity/seriousness of incidents shall be put in place to improve conditions.

All drivers of trucks and construction vehicles will be given this TMP and will be aware of the truck and vehicle routes and advised to channel into staff prior to delivery.

All plant and heavy machinery will be placed or parked within the site. No plant or machinery will be placed on the street. No dog trailer or over size vehicle to be left on local roads unless approval has been obtained for a one-off occasion from Rockdale Council. During demolition and excavation all construction vehicles will be loaded within the site, where possible for the duration of the project trucks will enter through Entry/Exit Gates on Beehag Street and Jacobson Avenue (shown in Figure 2) and TCPs at back of TMP.

Work vehicles will arrive and depart from the site access gates located on Beehag Street & Jacobson Avenue in a forward direction. All trucks arriving and departing the site are to be under the instruction of traffic controllers and leave site in a safe and suitable manner.

All trucks arriving to site will be pre-booked by Taylors management.
The proposed work will involve a degree of pedestrian management when deliveries and all activities arrive to site and if these affect the footpath, a Traffic controller will be required to put temporary barriers in place to stop pedestrians when work vehicles are accessing work site.

No materials, equipment, structures or goods of any type are to stored within 5m of the trunk of a tree.

Dust control measures are to be implemented during all periods of earth works, demolition, excavation and construction to minimise the dust nuisance on surrounding properties. The council guidelines for Controlling Dust from Construction Sites and Section 126 of the Protection of the Environments Operations Act 1997 to be utilised.

No materials, skip bins, concrete pumps, cranes, machines or temporary signs shall be stored on the council's footpath, nature strip, park or reserve without the prior approval of Council under section 138 of the roads act 1993.

Figure 2

All exiting trucks shall be:

- Loaded to their prescribed weight limits.
- All trucks will be covered by tarpaulin or like prior to leaving the site as required.
- All vehicles leaving the site must be free of mud or any other debris. Drivers of vehicles that exit the site must check their vehicles are clean prior to exiting. It is the responsibility of each driver to confirm their vehicles are clean prior to exiting site.

Taylor Construction will ensure that:

- No vehicle shall make deliveries outside Council's approved DA site hours
- All delivery vehicles will arrive at pre-arranged times to site.
- No queuing or marshalling of trucks shall occur for this site. Any vehicles that arrive to site that are unable to be accommodated as outlined in this CVPPM shall be sent back to their origin.
- All vehicles arriving to the construction site shall strictly adhere to the speed limit.
- This CTMP and all relevant plans shall be given to all transport companies associated with the site and expected to pass relevant information to its personnel and truck drivers arriving to site.

Construction vehicles required by the proposed construction activities include:

- Heavy Rigid Vehicles (12.5HR);
- Multi Combination Vehicles (Truck & Dog);
- Infrequent use of semi-trailers for special deliveries;
- Concrete pumper and agitator vehicles during building works;
- Small to medium sized trucks for other deliveries.

At this stage the use of oversized and over mass vehicles is not foreseen. Nevertheless, if it is required at a later stage, approval for each occasion would be sought from the relevant approval authority.

During the strip out phase, it is estimated up to some 16-24 truck movements per day would be taking demolition material from the site.

During the construction phase, peak activity would occur during concrete pours with a number of concrete trucks per day requiring to delivery concrete mix to the site. There is approximately 4 major pours, approximately 30 movements per day.

2.5 Arrival & Departure of Vehicles

Adequate advanced warning and directional signage will be placed around the site. This will direct drivers to the construction site and inform other drivers and pedestrians of upcoming works on their route.

Authorised Traffic Controllers shall be on-site ensuring controlled entry and exit in and out of site. This shall ensure movements shall not affect traffic flow or endanger pedestrians, by giving way to pedestrians and cyclists before trucks enter and exit site.

All truck movements shall be carried out taking into consideration the surrounding building and roads. Adequate measures to reduce severity/seriousness of incidents shall be put in place to improve conditions.

<u>VEHICLES - Arrival Route to site</u>

It is illegal to park a truck exceeding 4.5 tonnes on a roadway for more than one (1) hour unless signs are installed allowing such and illegal to barricade/ reserve a section of roadway without the prior approval of Council. Vehicles shall leave site in a forward direction with the assistance of Authorised Traffic Controllers. Under no circumstances will vehicles be permitted to leave site in reverse.

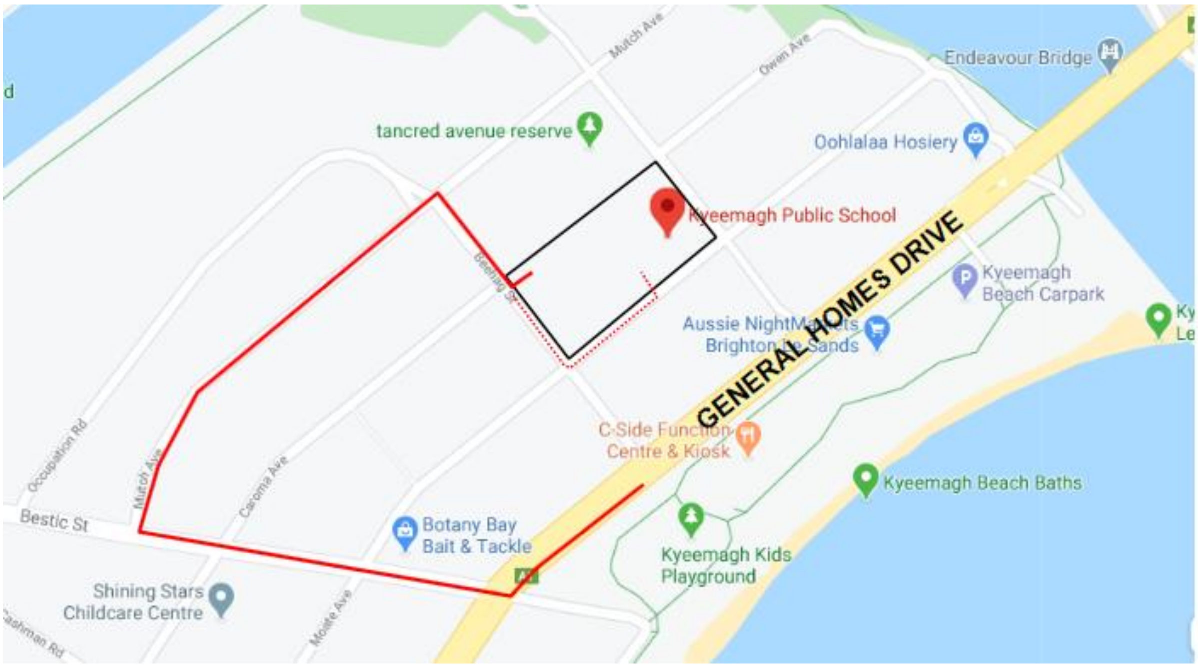


Figure 3

- Truck Arrival Route (Arriving General Homes Drive/Bestic Street/Mutch Avenue/Beehag Street – Site/Jacobson Avenue - Site

Trucks travelling on General Homes drive can enter turning left or right into Bestic Street.

Follow Bestic Street for approximately 300m

Turn right onto Mutch Avenue

Turn right into Beehag Street to Kyeemagh Public School and enter site

Departure Route from Site

- Truck Departure Route (Beehag Street/General Homes Drive /or Jacobson Avenue/ Tancred Avenue/ General Homes Drive).

Exit site and follow Beehag Street,

At the T-intersection turn left onto General Homes Drive to required destination

Exit site from Jacobson Avenue, Travel north to Tancred Avenue,

Turn right into Tancred Avenue,

At the T-intersection turn left onto General Homes Drive to required destination

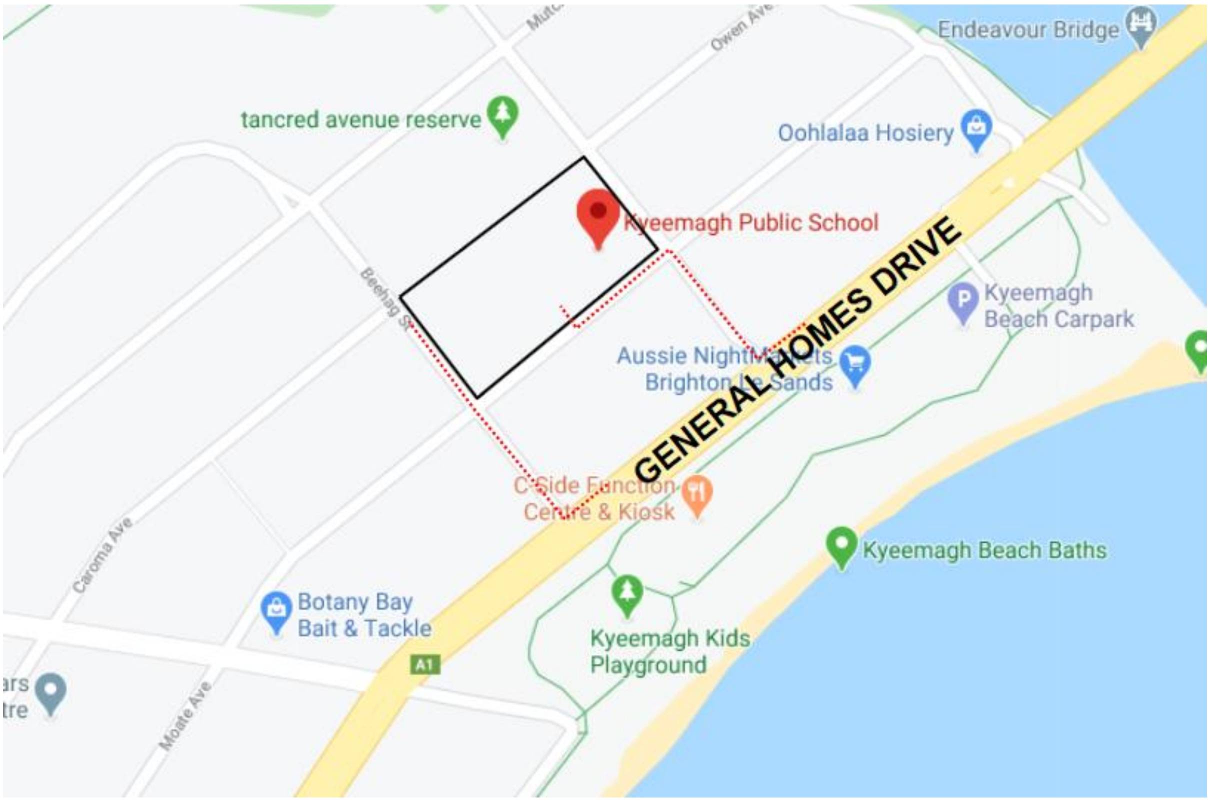


Figure 4

Construction Vehicles and Plant accessing work site

All loading and unloading of materials shall be done within the site. Trucks are not to queue on the driveway or on public roads; traffic controllers shall manage the ingress and egress. Trucks unable to immediately enter site shall que at a remote location. All drivers of trucks and construction vehicles shall be issued this CTMP and shall be made aware of the truck and vehicle routes.

All plant and heavy machinery will be placed or parked within the site. No plant or machinery shall be placed on the street. No vehicles to be left on local roads unless approval has been obtained for a one-off occasion from Council. All vehicles, plant, and equipment shall be operated in accordance with NSW Road Rules 2014.

3. DRIVERS CODE OF CONDUCT

This drivers Code of Conduct for Heavy Vehicles is to ensure that drivers adhere to the designated transport routes, and outline procedures to ensure that drivers implement safe driving practices, particularly when entering/exiting truck routes.

All Employees and contractors are made aware that responsible driving and adhering to the code is a condition of employment at Kyeemagh Public School upgrade. All drivers are trained in the Code of Conduct and audits of the compliance with the Code are conducted. All drivers reported or found to be acting in a manner contrary to the Code will be subject to disciplinary action.

3.1 General Requirements

Heavy vehicles drivers hauling from Kyeemagh Public School must:

- Hold a valid drivers licence for the class of vehicle being operated.
- Operate the vehicle in a safe manner with and external to the site.
- Comply with the direction of authorised site personnel when within the site.

3.2 Heavy Vehicles Speed

Drivers are to observe the posted speed limits on all public roads in particular all drivers are advised to proceed near the school or school buses at 40km/h, with speed adjusted appropriately to suit the road environment and prevailing weather conditions to comply with the Australian Road Rules. Vehicles to proceed at 10km/h while being escorted in/out of work site.

3.3 Heavy Vehicle Control

In order to minimise the impact of noise from truck transport, the following controls apply to truck operators at Kyeemagh Public School Upgrade

- Compression brakes not to be used in the vicinity of the School
- Tailgates must be locked and secured to avoid noise and spillage
- Always observe the posted speed on site and the local road network
- No tail gaiting is permitted – a 3 second gap is to be observed at all times
- Equipment to be used must be fit for purpose
- Drivers to obey the loading, dispatch and product transportation times

3.4 Load Covering

Loose material on the road surface has the potential to cause road crashes and vehicles damage. All loaded vehicles entering or leaving the site are effectively covered for the duration of the trip. The load cover must be removed upon arrive at the site. All care is to be taken to ensure that all loose debris from the vehicle body and wheels is removed prior to leaving the site and again after uploading. Drivers must ensure that following the tipping that the tailgate is locked before leaving the site. Taylors management is to monitor loose material on the side of haulage route from the site and take appropriate action regularly.

3.5 Cleanliness

All loaded vehicles are to be inspected prior to leaving the site for cleanliness. Any materials that could fall on the road should be removed prior to leaving the site.

3.6 Vehicle Departure and arrival

Taylors to plan trucks arrival and departure to avoid peak periods. To alleviate public concern and increase road safety, heavy vehicles leaving the site should be separated and it is important for all drivers to be aware of the requirement to avoid convoys leaving the site. Taylors to plan deliveries to avoid school peak hours.

4. Dust

Taylors Construction is responsible for the mitigation of all dust generated on site or as a result of undertaking the works. Taylors is to allow for the provision of ‘sticky mats’, floor protection, wetting down, cleaning and the like to ensure that dust is not tracked through the building or the building surrounds. Taylors shall protect all existing services from dust by covering or sealing the likes of existing air conditioning units, ductwork, intakes, distribution boards, and the like. This extends to providing and maintaining a dust free environment for the installation of any communications and telephone equipment,

5. Fencing, Barriers & Hoarding

Temporary fencing shall be erected around all work. Traffic controllers shall be present to manage all pedestrian movement with the erecting of the hoarding. Where the hoarding is to be erected over the footpath or any public place, the approval of Council must be obtained prior to the erection of the hoarding.

Any openings in the existing perimeter fencing shall be secured with fencing and hoardings to keep the site secure and any new fencing shall be temporary (such as cyclone wire) and at least 1.8 metres high. All fencing is to be maintained for the duration of construction to ensure that the work area is secured.

A sign shall be displayed on the site indication the name of the person responsible for the site and a telephone number of which that person can be contacted during and outside normal working hours, or when the site is unattended.

The sign must be erected in a predominant position shall display the following:

- Name, address, and telephone number of the principle certifying authority for the works
- Name of principle contractor (if applicable) for any building work and a telephone number on which that person may be contacted out of hours
- Unauthorised access to the work site is prohibited

No portion of the proposed fence, including the footings, is to encroach beyond the boundaries of the subject property.

Alternatively, documentary evidence that the owner of the adjoining property has no objection to the construction of the party fence wall on the common boundary between these properties is to be submitted to Council prior to the issue of a Construction Certificate

6. Waste Management and Recycling

A formal Construction Waste Management Plan will be produced by Taylors prior to works commencing. All material that cannot be recycled or reused will be disposed to an approval landfill facility. Waste will be minimised and that generated will be separated to maximise recycling. The highest waste production will be will be during the demolition of existing buildings onsite.

Dangerous goods (such as petrol, diesel, oxy-acetylene, oils, etc) will be stored in a lockable compound with sufficient ventilation in accordance with relevant codes of practice and standards. Material safety data sheets on all flammable and potentially harmful liquids will be provided by the contractor undertaking the works.

7. Removal and storage of Rubbish or spoil.

All industrial rubbish bins will be stored on site and in a position for easy access for removal by trucks. All removal trucks will have the load covered by tarpaulin or other means to secure load. All excavations and backfilling shall be executed safely and in accordance with the relevant Australian Standards.

Council expects demolition and excavated material to be reused and/or recycled wherever possible. No materials shall be placed, dumped, of left on any Council road or footpath. Removed or damaged street furniture, including parking and street signs, shall be replaced immediately. Copies of demolition and construction waste dockets that verify the facility that received the material for recycling or disposal and the quantity of waste received, must be retained on site at all times during construction.

8. Responsibility

It is the responsibility of Taylor Constructions to ensure that these traffic measures are disseminated, implemented and maintained in accordance with the principles in the project, Occupational Health, Safety & Rehabilitation Management Plan: and; it is the responsibility of every worker involved with this work site to comply with the guidelines set down in this plan

9. Emergency Response

- Secure Traffic Solutions will provide traffic control by qualified traffic controllers for emergencies such as accidents and spillages on the maintained network.
- Secure Traffic Solutions will use an appropriate standard plan drawn from the RMS Traffic Control at Work Sites Manual (Appendix D), adjusting it as needed to suit the site conditions.
- For all other planned and scheduled maintenance and other works under the contract, Secure Traffic Solutions will prepare Traffic Control Plans as required.
- Nearest Police Station – Hurstville Police Station (02) 9375 8599
- Nearest Fire Station – Kogarah Fire & Rescue (02) 9587 0878
- Nearest Hospital – St George Hospital, (02) 9113 1111
- Nearest Medical Centre – Myhealth Medical Centre 02 9051 2882
- All other Emergency numbers CALL 000

10. Time Management

Taylor Construction aims to meet its time related obligations. Among them are:

- Notifying emergency services and relevant sections of the community and transport industry of work which results in significant traffic disruption.
- Notifying residents and businesses affected by disruption to property access or by night works in built up areas. A letter will:
    - be "letter-box-dropped" at least three Business Days before the proposed date and
    - Detail the dates and times of the proposed access restrictions and contact details.
    - Performing work and Services only in the times permitted.
- Lodging early as possible (at worst no less than 10 Business Days before the work) a road occupancy application. See RTA G10 (2.6). Noting, however, the exemptions for emergencies and hazards set down at RTA G11 (8).
- Promptly advising the TMC of delays to traffic which are, or are anticipated to be, longer than 15 minutes.

11. PROPOSED STRATHEGY OF TRAFFIC MANAGEMENT TO ENSURE ROAD SAFETY & NETWORK EFFICIENCY

A. IMPACTS ON GENERAL TRAFFIC - Road/Lane Closure

- The proposed works will not require any road or lane closures and should not delay general traffic. If at any stage the work does require these closures all permits will be applied for through Council prior to the commencement of works. If a partial road closure, temporary driveways or mobile cranes are required appropriate application will be made to Council prior to commencement of such works.
- No roadworks will be undertaken on state roads or within 100 m of traffic signals for this project. If the need occurs to undertake such works a Road Occupancy Licence will be made to NSW Transport Management Centre and a copy will be provided to Council.
- Approval from RMS will not be required for any work activity as vehicles are exiting the job site in a forward direction and no stopping of traffic required near traffic signals.

- All traffic control plans (TCPs) associated with this CTMP will comply with relevant Australian Standards and RMS Traffic Control at Worksites Manual.
- The works shall not impact the local public transport network. The proposed construction activities would not require the relocation of any existing bus stops or bus routes in order to accommodate the construction activities.

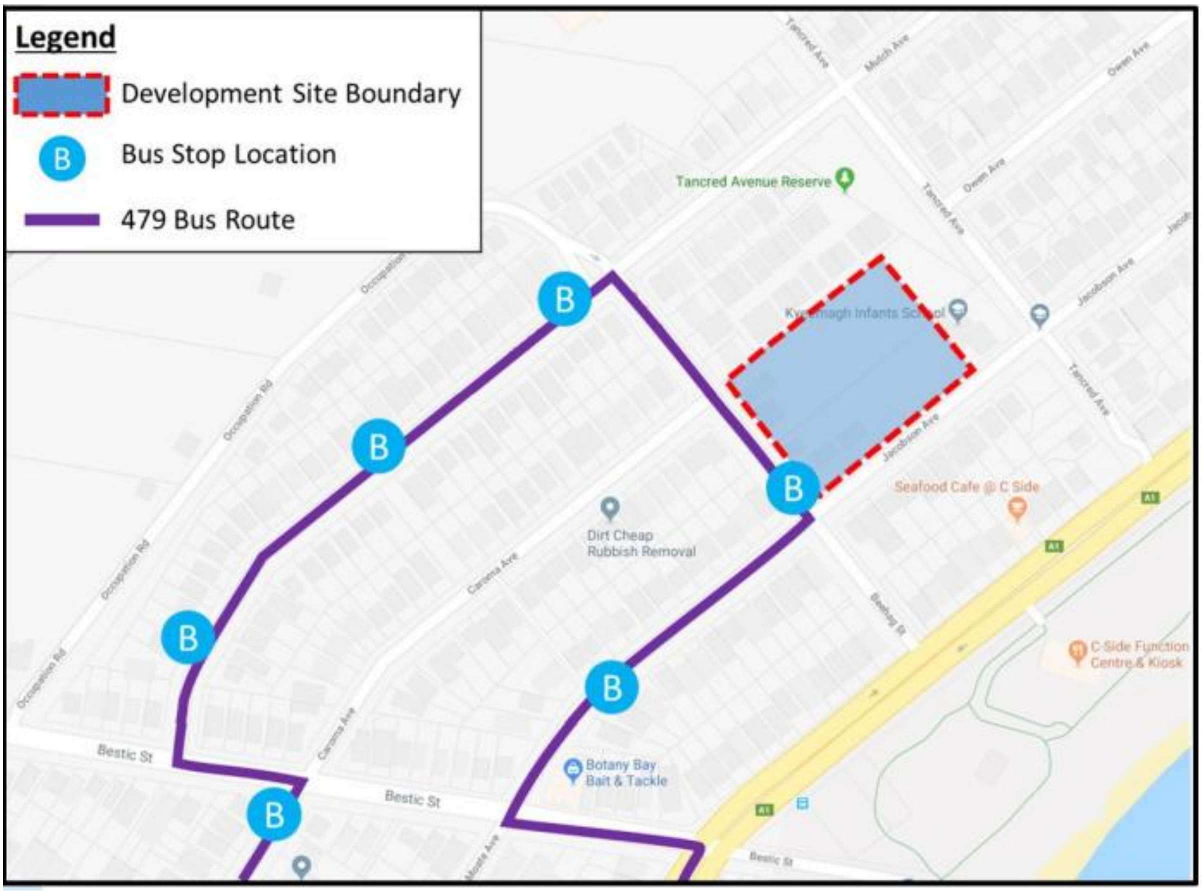
CONSTRUCTION WORKER TRANSPORTATION STRATEGY

B. Parking for Site Workers

- While a limited amount of car parking will be available for construction personnel, workers will be encouraged to use public transport when travelling to and from the site. It is noted that there is a bus route on Beehag Street. 479 bus takes you to and from Rockdale train station.
- There is all day street parking on all surrounding roads.
- It is recommended that an onsite tool drop off and storage facility is included in the construction site management such that construction personnel can drop tools to the site by vehicle and then store them on site for the duration of works, thus enabling them to travel on public transport without needing to transport heavy tools each day.

C. PUBLIC TRANSPORT.

- The existing public transport servicing the site is 479 bus which runs from Rockdale to Kyeemagh. The 479 bus has 25 stops departing from Rockdale train station on Geeves Avenue Stand C and ending on Bay Street near Trafalgar Street. The service normally starts operating at 18.07 and ends at 18.38. The map of the bus network near the site is provided below:



D. Impact on Pedestrians

- When the works are affecting footpaths traffic controllers will ensure to provide an exclusion zone around the work area.
- Only authorised personnel will be permitted within the building site unless accompanied by site management, if not inducted to the site. Whilst within the confines of the building site, all personnel will attire in correct PPE to ensure that they are visible to moving traffic
- When trucks are entering/exiting the worksite, RMS accredited traffic controllers will be employed to manage pedestrian movement and temporary stop all pedestrians while there is truck movement occupying the footpath. If any work is taking place on the footpath, traffic controllers will have to ensure there is a pedestrian pathway in place to direct pedestrians safely around the work area. Outside of construction hours the footpath will be free of any barricades or building materials.

Footpaths surrounding work site

E. Impact on Cyclists

The works will not cause any disruption to the local cyclist network. If the works impact the road network traffic controllers will ensure to implement a safe, viable and clear alternative for cyclists. The proposed construction activities would not require the relocation of any existing cycle lane. Traffic controllers may need to temporary stop cyclists when work vehicles are entering/exiting the work site. No detour route will be required.

F. Emergency Vehicle

- The construction activities of the proposed project would not adversely impact on the accessibility or operation of emergency services for access to the site or surrounding properties as all existing roads and individual property accesses would remain open and accessible during the construction activities associated with the site works. If the case, any emergency vehicle required for site will be given priority and when practicable, assisted by Authorised Traffic Control.

G. Access to properties and Noise

- The works will not affect access to properties. Regarding noise impacts, Taylors Construction will strive to keep all noise associated with the works is kept to a minimum. Likewise, no noise will be made outside the approved hours for site.
- Where there is a strong community reaction to noise associated with demolition, excavation and/or construction, council may require respite periods by restricting the hours that the specific noisy activity can occur.
- If this is imposed, council will consider
  - Times identified by the community when they are less sensitive to noise.
  - If the community is prepared to accept a longer period of construction in exchange for restriction on construction hours.
- Prior to commencement of the site preparation works, it is recommended that Taylors Constructions inform the local community regarding the traffic control and management arrangements that will be implemented and the timing/duration of works. It is envisaged that the requirements for community consultation will be set out in the conditions of consent, and all the community notification.
- Notification of any work affecting any properties or residents will be notified in the form of a letter will be made by letter box drop two weeks prior then again, the day before the work starts.

12. **Traffic Controllers**

RMS Accredited Traffic Controllers. will be on-site ensuring controlled entry and exit into site that does not affect traffic flow or endanger pedestrians by giving way to pedestrians and cyclists before trucks enter and exit site. Traffic controllers will wait for a suitable gap in traffic and pedestrian movement before assisting construction vehicles entering or leaving the site.

13. Community & Motorists Consultation/Notification

A Taylors representative is available to meet with any neighbours affected by the site works to discuss the proposed measures mentioned within this construction traffic management plan. Notification of construction activity will be sent to properties near the work site. This notification in the form of a letter will be made by letterbox drop two weeks prior to work commencing and again the day before works commences. Temporary advance warning signs will advise motorist of their approach to the work site. Regular consultation to be held with Council’s manager for social and community services

14. **Permits and Road Occupancy Licence**.

A work zone permit will need to be applied for through council where any work zones are required for deliveries or loading zones outside of the site boundary. A Road Occupancy Licence will not be required for this job as vehicles enter/exiting on Beehag Street and Jacobson Avenue which are not RMS roads. The builder and traffic control company will adhere to any and all conditions expressed on any licences required.

15. Workplace Health & Safety

Taylors Construction will access the risk and will incorporate the traffic control plans and the traffic management plan into the site safety plan.

This CTMP must be included in site inductions to ensure all new employees are aware of the construction management obligations.

16. Traffic Control Plans

Traffic control plans, Vehicle movement plan and pedestrian movement plans for this project are included in this document. The TCP is a diagram showing signs and devices arranged to warn traffic and guide it around, past or, if necessary through the work site or temporary hazard. Taylors will ensure authorised traffic controllers will be present on site to assist access of trucks in and out of the site ensuring the safety of pedestrian's, cyclists and all other vehicles. The Land uses surrounding the site are residential. The site is located within close proximity to the School which attracts significant vehicles during morning and afternoon drop off and pic up periods during the week.

The TCPs were designed to address the following issues where applicable:

- Use of traffic control devices
- Speed limit requirements
- Provisions for pedestrian traffic and their safety
- Provisions for cyclists and their safety
- Provision for vehicle and plan movement
- Parking restrictions and parking facilities
- Provision for trade vehicles and plant movement
- Informing all site personnel of any high-risk areas, and
- Providing adequate signage within the Construction site for access and egress of vehicles.

17. Monitoring and Review

Monitoring and review is important throughout the TMP process (both preparation and implementation) to ensure that the TMP remains current and addresses all risks at the worksite. After the TMP has been implemented, a review should be undertaken to ensure that it is operating as expected. Schedule further reviews as the program progress, to ensure that the plan continues to operate as expected.

Daily Inspections

The monitoring program generally incorporates daily inspections:

- Before the start of work activity on site
- During the hours of work
- Closing down at the end of the shift period
- After work hours

Provide a template for a daily inspection register allowing indication of:

- When traffic controls were erected
- When changes to controls occurred and why the changes were undertaken
- Any significant observations associated with the traffic control and their impacts on road users or adjacent properties

Collecting information is particularly important in the event of an incident, in case legal proceedings result.

TMP Review & Improvement

Outline a process to facilitate continuous improvement which may include debrief meetings to discuss any issues or risks associated with the plan.

Ensure the TMP is kept up to date taking into account changes in traffic volumes, vehicle types, the road environment, work practices, standards, and jurisdictionally specific legislation.

Review of the TMP will be required if any on-site changes occur (with the exception of repositioning of traffic control devices) by a person appropriate qualified in the relevant jurisdiction.

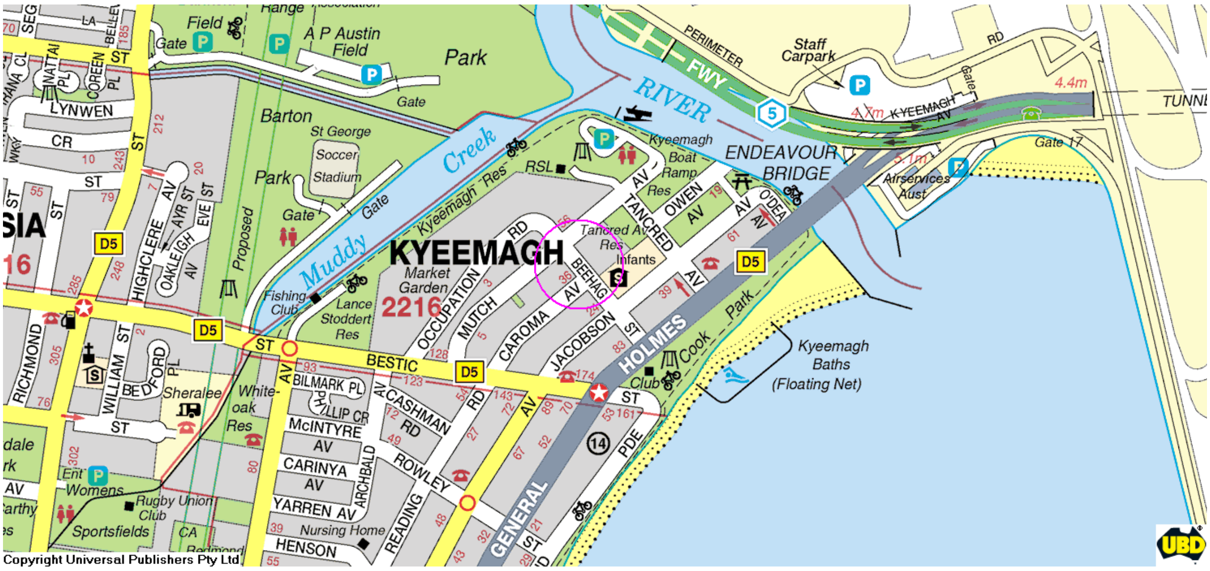
A copy of all documentation relating to the endorsement of the changes must be held on-site by the person managing the works.

Where there are non-compliances identified the procedure should have a mechanism for the issuing of a formal corrective action. Corrective actions should be closed out and a registered as such in accordance with the organisations normal practice.

18. Out of Working Hours Contacts

Steve Ziaziaris – Senior Project Manager – Taylor Constructions
0413 182 641

19. Map



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20. Appendix A - Traffic Controllers' Tickets

Surname	First Name	Contractor Name	Certificate Number	Expiry Date
Diggins	Bridget	Secure Traffic Solutions	0051906031	24-01-2022

NSW Transport Roads & Maritime Services

Prepare a Work Zone
Traffic Management Plan
Card No. 0051906031

This qualification enables you to prepare Traffic Management Plans and conduct inspections on Traffic Management Plans.

BRIDGET
DIGGINS

Expiry Date:
24/01/2022

This card is not a proof of identity.

Appendix B– Resume

Name: Bridget Diggins

Phone: 0416 430 138

Address: PO Box 760, Manly, NSW 2095

Qualifications

Prepare a Work Zone Traffic Management Plan
Bachelor of Arts – Information Systems Management

EMPLOYEMENT HISTORY

Secure Traffic Solutions 23/10/2019 – present

Managing Director

Commercial TC – 19/01/2017 – 23/03/2020

Operations Manager

The Traffic Marshall – 20/05/2015 - 17/01/2017

Operations Manager

Downer Australia

Traffic Management Manger 2008 -2015

WORK EXPERIENCE

- I have worked in Traffic Management for the past 15 years designing traffic management plans in accordance with Australian Standard AS 1742.3whilst also utilizing the RTA Manual for Traffic Control at Worksites as a guideline.
- Planning for all aspects of Traffic Management following OH&S guidelines and legislation.
- Submit plans and appropriate paperwork to the RMS Transport Management Centre to obtain Road Occupancy License.
- Liaise with Council, buses and correspond with a wide variety of stakeholders.
- Submitting TMP's (Traffic Management Plans) & TCP's (Traffic Control Plans) to Council/RMS/Buses etc for all works within the contract.
- Site inspections
- Allocation of traffic control labour hire to all work projects

Appendix C –Consultation Record

Post Approval Consultation Record

Identified Party to Consult:	Bayside Council, TfNSW - Transport Management Centre, Transit Systems
Consultation type:	Telephone conversation/email consultation
When is consultation required?	Prior to commencement on project. Permits maybe required later after commencement/during construction when affecting roadway outside site boundary
Why	Condition A8
When was consultation scheduled/held	22/07/2020, 28/07/2020, 29/07/2020
When was consultation held	22/07/2020 – Bayside Council, 28/07/2020 TfNSW, 28-07-2020 State Transit
Identify persons and positions who were involved	Bridget Diggins – Secure Traffic Solutions, Almustafa Kamil – Bayside Council, Chantel Tu – TfNSW, Adrian Prichard –Transit Systems
Provide the details of the consultation	Introduction to project, Submit Construction Traffic & Pedestrian Management Sub Plan Obtain approvals, Obtain advice on what permit applications need to be submitted prior to commencing work. Introduce relevant team members, our position identify any issues to be discussed.
What specific matters were discussed?	Notification of upcoming work Permits and approvals
What matters were resolved?	Permit application process Council Approval Transit Systems approval
What matters are unresolved?	
Any remaining points of disagreement?	No at this time
How will SINSW address matters not resolved?	

Appendix D – BAYSIDE COUNCIL CORRESPONDENCE

From: **Almustafa Kamil** <Almustafa.Kamil@bayside.nsw.gov.au>
Date: Wed, 29 Jul 2020 at 14:12
Subject: FW: Construction Traffic & Pedestrian Management Sub Plan - Kyeemagh Public School
To: Bridget Diggins <bridget@securetrafficsolutions.com.au>
Cc: Karim Elazar <Karim.Elazar@bayside.nsw.gov.au>, Josh Ford <Josh.Ford@bayside.nsw.gov.au>

Hi Bridget,

The submitted Traffic Management Plan (dated 23/06/2020) and the Traffic Control plan (dated 28/05/2020) are acceptable and satisfy council requirement.

In regards to the request of occupying 1 carspace in both side of the proposed construction site entry at Jacobson Avenue, you will need to fill page 1,2 and 3 of the Work Activates on Council Sites Application (Attached).

Please fill it and email it back to me, so I can lodge it on your behalf. Since the proposed works related to public/government development, you will only be charged the application fee ($141.00). An invoice will be sent to you after lodging the application.

Don’t hesitate to contact me should you have any questions.

Kind Regards,

Almustafa Kamil Public Domain Engineer

444-446 Princes Highway, Rockdale NSW 2216

P (02) 9366 3817

E Almustafa.kamil@bayside.nsw.gov.au **W** www.bayside.nsw.gov.au

Appendix E –TRANSIT SYSTEMS CORRESPONDENCE

On Wed, 29 Jul 2020 at 09:35, Adrian Prichard <APrichard@transitsystems.com.au> wrote:

Hi Bridget

Transit Systems raise no objections. Please ensure buses take preference

at Traffic control site on Beehag St site entrance.

Regards

Adrian Prichard

Network Planner

T: (02) 8778 5889 M: 0490 121 539

E: APrichard@transitsystems.com.au
A: Lot 2 Airfield Drive, LEN WATERS ESTATE NSW 2171

www.transitsystems.com.au **Error! Filename not specified.**

Transit Systems Confidential communication. Please Note: This email and any attached files may be confidential, privileged and intended solely for the addressee. It may not be reviewed, acted upon, filed or communicated to or by any other person. If you have received this email in error please delete it and notify the sender immediately. Although our system is regularly checked by virus scanning software, updated daily, Transit Systems does not guarantee that emails or attachments are free of viruses or interference. Please check for viruses and defects before opening or using attachments. Our liability is limited to resupplying any affected attachments.

Appendix F –TfNSW CORRESPONDENCE

---------- Forwarded message ---------
From: **Bridget Diggins** <bridget@securetrafficsolutions.com.au>
Date: Tue, 28 Jul 2020 at 22:37
Subject: Construction Traffic & Pedestrian Management Sub Plan - Kyeemagh Public School
To: <Chantel.TU@tmc.transport.nsw.gov.au>

Hi Chantel,

My client Taylor Constructions are upgrading Kyeemagh Public School. None of the works affect any lanes on an RMS road. One of the conditions that they require is confirmation that I have consulted with TfNSW about the works that are going ahead and confirmation I have informed you of the works and I suppose confirmation that no approvals are required

Did I need to submit an rol application to get this confirmation or can you direct me to who can provide it.

I have attached a copy of our Construction Traffic & Pedestrian Management Sub Plan for Kyeemagh Public School for your review.

Most of the work will be from within the boundary of the site. If you could help me with who to contact regarding this it would be greatly appreciated.

Thank you for your help

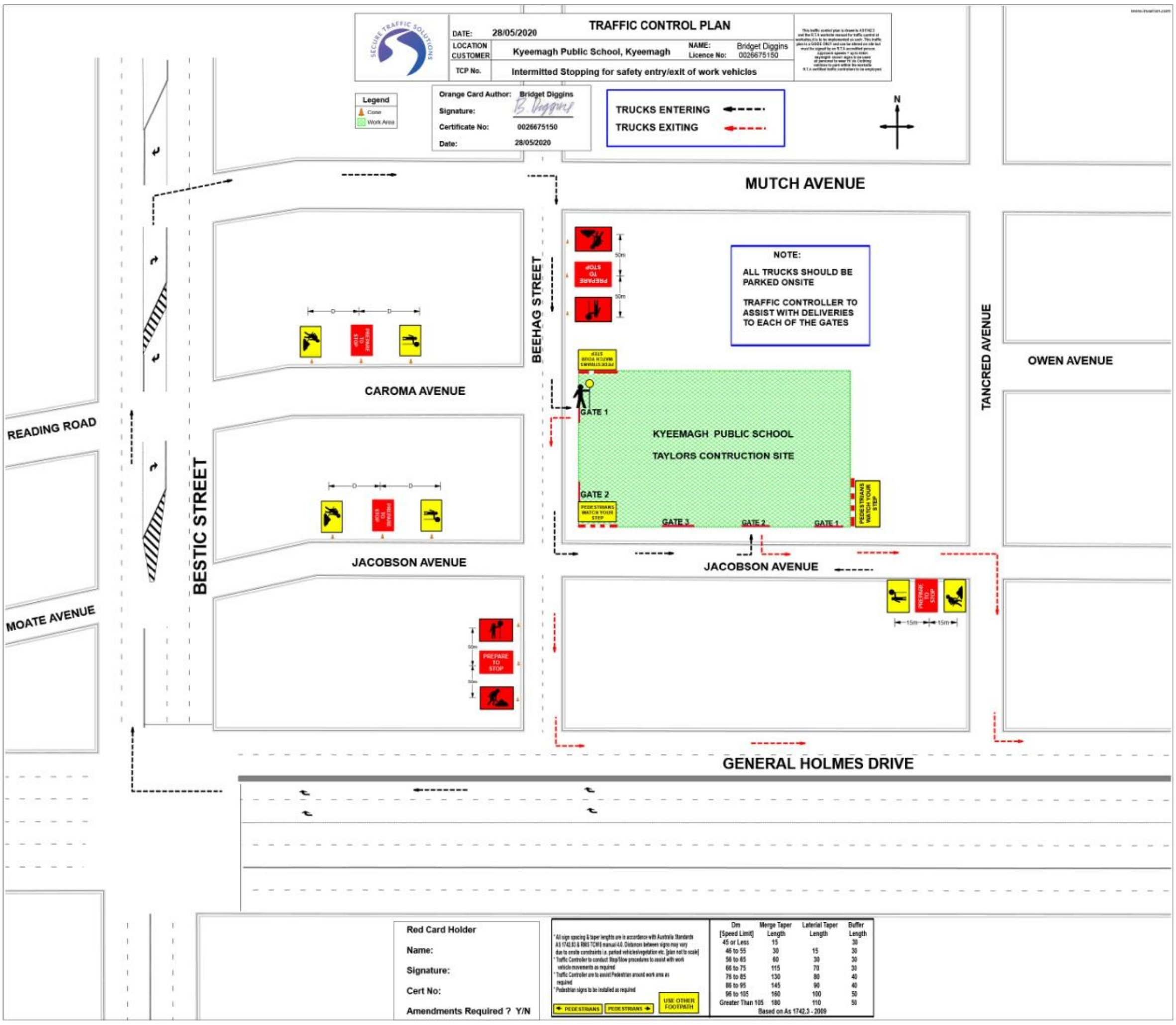
Kind Regards,

Bridget Diggins
Managing Director
Tel: 0416 430 138

Secure Traffic Solutions Pty Ltd
Address: PO Box 760
MANLY, NSW 1655

Email: bridget@securetrafficsolutions.com.au
www.securetrafficsolutions.com.au

TRAFFIC CONTROL PLANS



TRAFFIC CONTROL PLAN

DATE: 28/05/2020

LOCATION CUSTOMER: Kyeemagh Public School, Kyeemagh

NAME: Bridget Diggins

Licence No: 0026675150

TCP No.: Intermitted Stopping for safety entry/exit of work vehicles

Orange Card Author: Bridget Diggins

Signature: B. Diggins

Certificate No: 0026675150

Date: 28/05/2020

NOTE:
ALL TRUCKS SHOULD BE PARKED ONSITE

TRAFFIC CONTROLLER TO ASSIST WITH DELIVERIES TO EACH OF THE GATES

Red Card Holder

Name:

Signature:

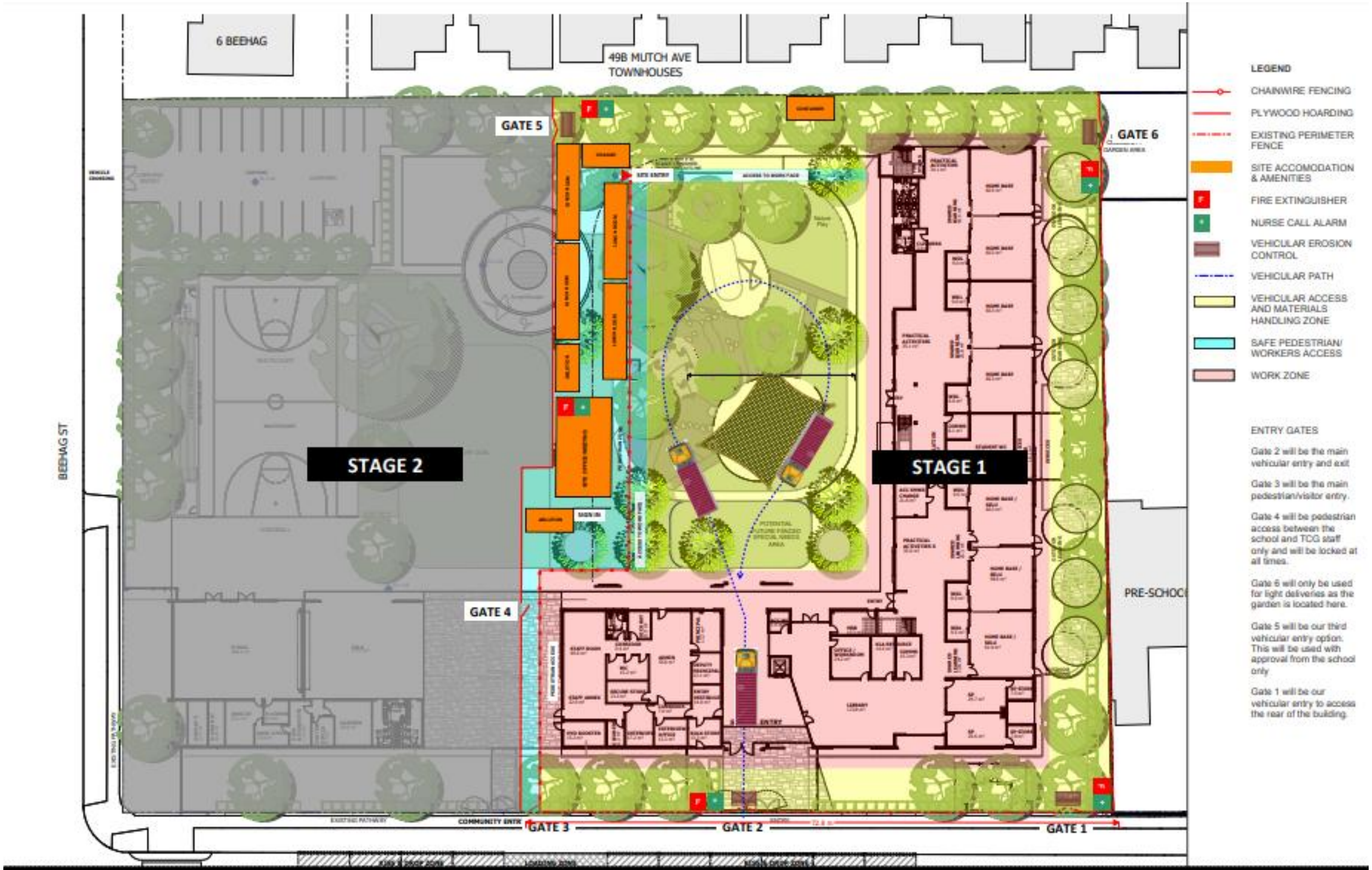
Cert No:

Amendments Required ? Y/N

- All sign spacing & taper lenghts are in accordance with Australia Standards AS 1742.03 & RMS TCWS manual 4.0. Distances between signs may vary due to onsite constraints i.e. parked vehicles/vegetation etc. [plan not to scale]
- Traffic Controller to conduct Stop/Slow procedures to assist with work vehicle movements as required
- Traffic Controller are to assist Pedestrian around work area as required
- Pedestrian signs to be installed as required

Dm [Speed Limit]	Merge Taper Length	Laterial Taper Length	Buffer Length
45 or Less	15		30
46 to 55	30	15	30
56 to 65	60	30	30
66 to 75	115	70	30
76 to 85	130	80	40
86 to 95	145	90	40
96 to 105	160	100	50
Greater Than 105	180	110	50

Based on As 1742.3 - 2009



ENTRY GATES

Gate 2 will be the main vehicular entry and exit

Gate 3 will be the main pedestrian/visitor entry.

Gate 4 will be pedestrian access between the school and TCG staff only and will be locked at all times.

Gate 6 will only be used for light deliveries as the garden is located here.

Gate 5 will be our third vehicular entry option. This will be used with approval from the school only

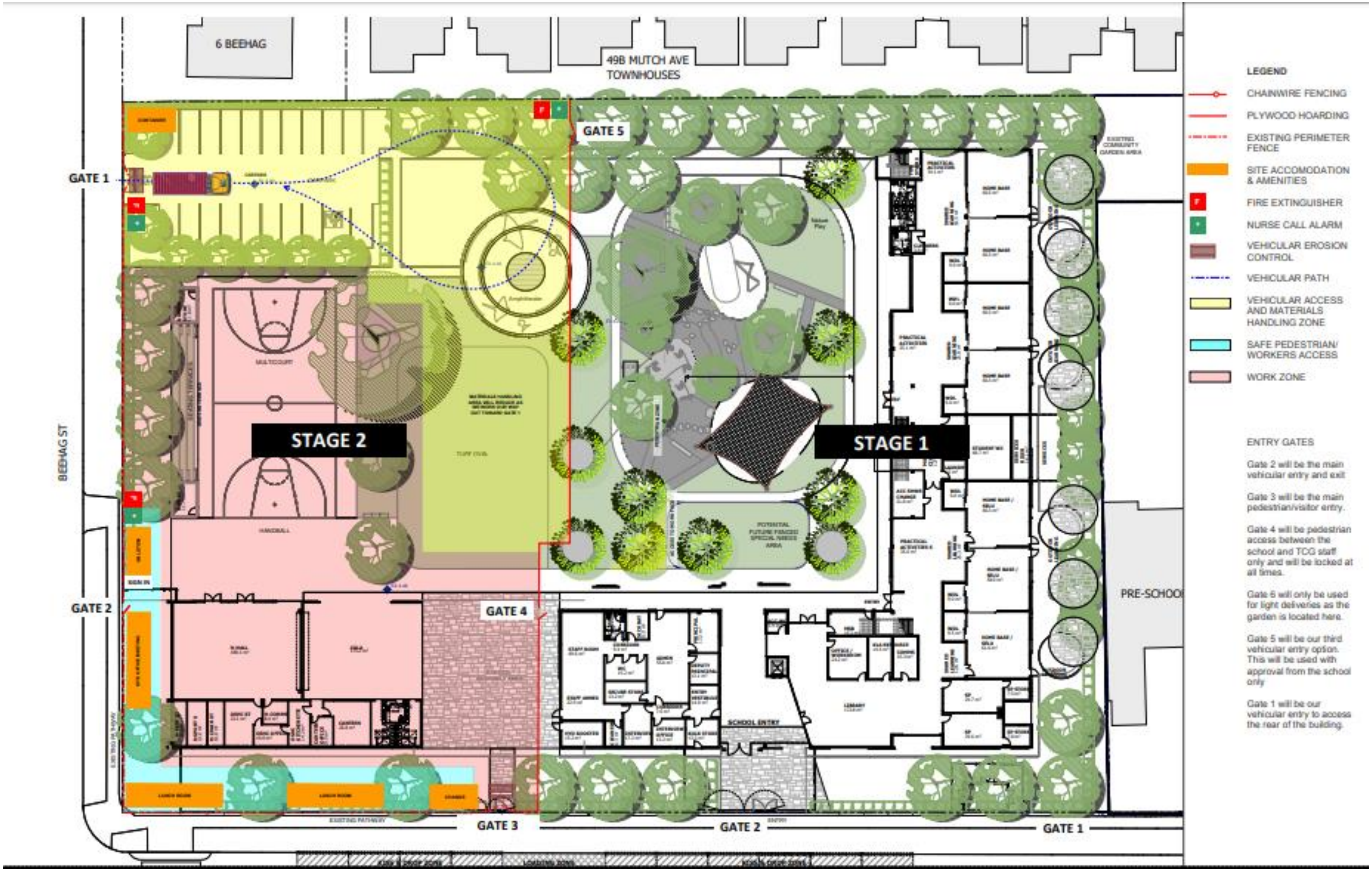
Gate 1 will be our vehicular entry to access the rear of the building.

SITE PLAN - STAGE 1

Rev 1

Kyeemagh Public School

TAYLOR



ENTRY GATES

Gate 2 will be the main vehicular entry and exit

Gate 3 will be the main pedestrian/visitor entry.

Gate 4 will be pedestrian access between the school and TCG staff only and will be locked at all times.

Gate 6 will only be used for light deliveries as the garden is located here.

Gate 5 will be our third vehicular entry option. This will be used with approval from the school only

Gate 1 will be our vehicular entry to access the rear of the building.

SITE PLAN - STAGE 2

Rev 0

Kyeemagh Public School

TAYLOR

TRAFFIC CONTROL PLAN

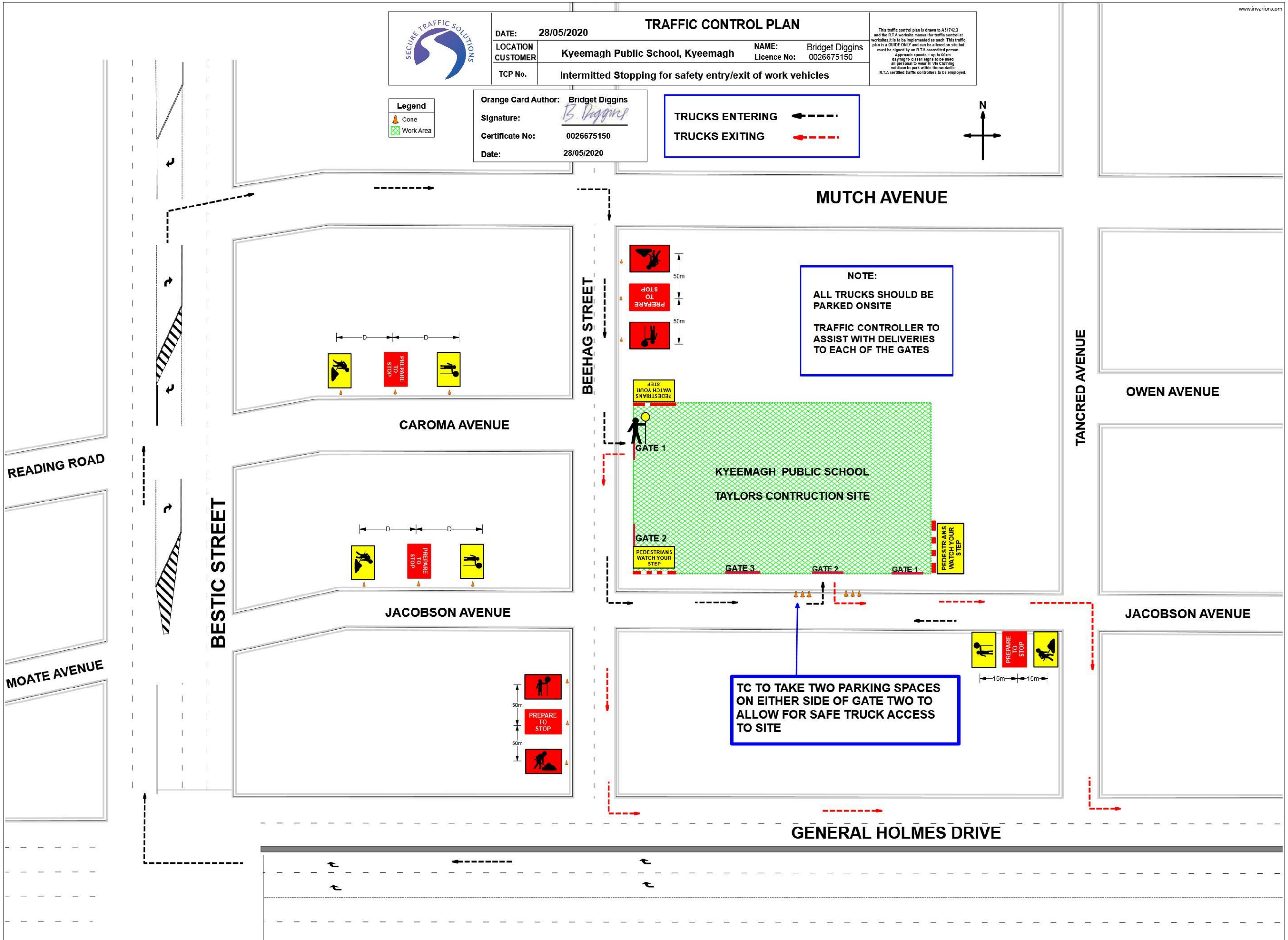
DATE:	28/05/2020
LOCATION CUSTOMER	Kyeemagh Public School, Kyeemagh
NAME:	Bridget Diggins
Licence No:	0026675150
TCP No.	Intermitted Stopping for safety entry/exit of work vehicles

This traffic control plan is drawn to AS1742.3 and the R.T.A worksite manual for traffic control at worksites,it is to be implemented as such .This traffic plan is a GUIDE ONLY and can be altered on site but must be signed by an R.T.A accredited person.
Approach speeds = up to 60km
day/night- class1 signs to be used
all personal to wear Hi Vis Clothing
vehilces to park within the worksite
R.T.A certified traffic controllers to be employed.

Orange Card Author:	Bridget Diggins
Signature:	B. Diggins
Certificate No:	0026675150
Date:	28/05/2020

Legend
- Cone
- 🟩 Work Area

TRUCKS ENTERING ←- - - -
TRUCKS EXITING ←- - - -

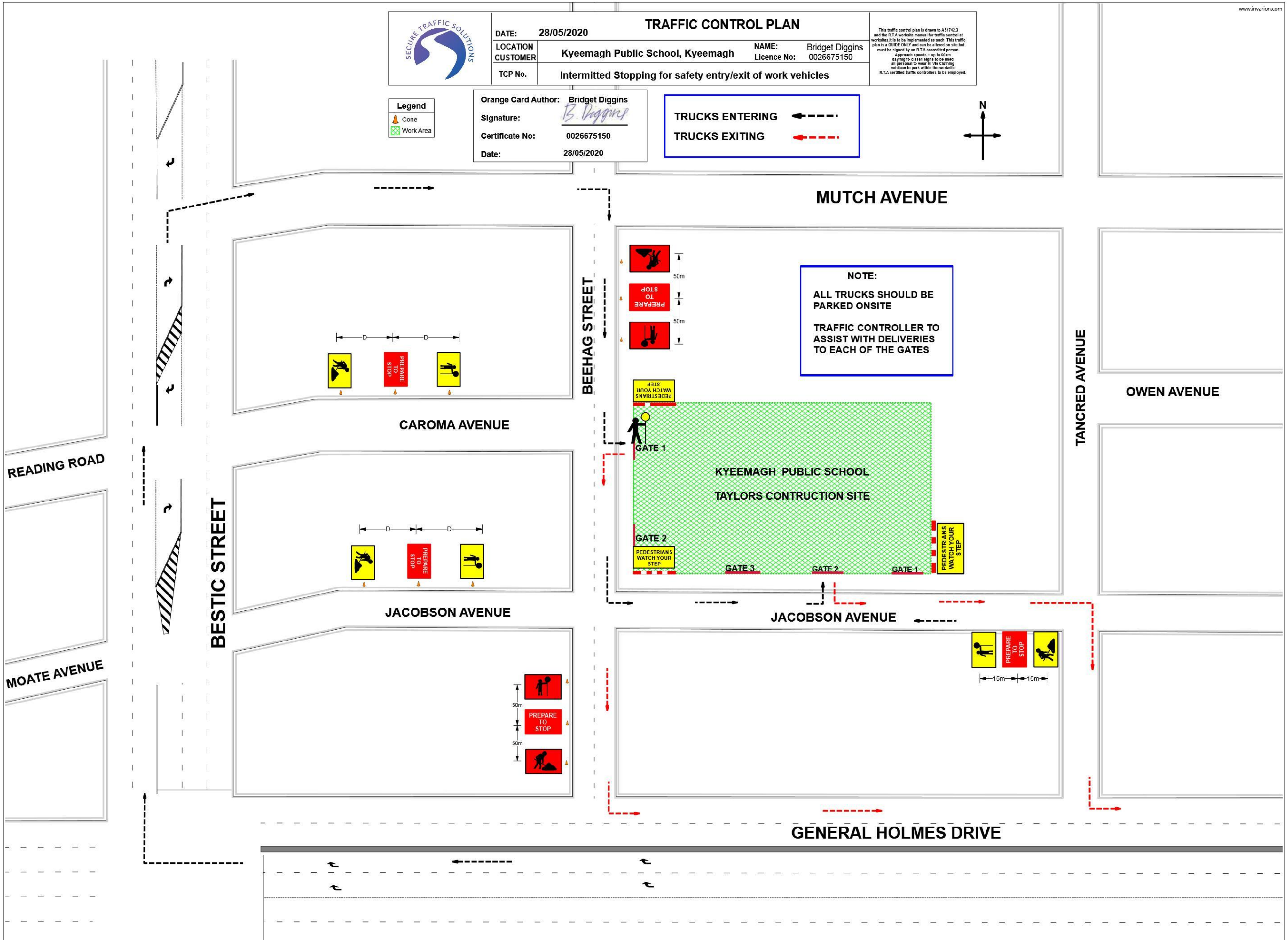


NOTE:

ALL TRUCKS SHOULD BE PARKED ONSITE

TRAFFIC CONTROLLER TO ASSIST WITH DELIVERIES TO EACH OF THE GATES

TC TO TAKE TWO PARKING SPACES ON EITHER SIDE OF GATE TWO TO ALLOW FOR SAFE TRUCK ACCESS TO SITE



SECURE TRAFFIC SOLUTIONS

TRAFFIC CONTROL PLAN

DATE:	28/05/2020		
LOCATION CUSTOMER	Kyeemagh Public School, Kyeemagh	NAME: Licence No:	Bridget Diggins 0026675150
TCP No.	Intermitted Stopping for safety entry/exit of work vehicles		

This traffic control plan is drawn to AS1742.3 and the R.T.A worksite manual for traffic control at worksites,it is to be implemented as such .This traffic plan is a GUIDE ONLY and can be altered on site but must be signed by an R.T.A accredited person.
Approach speeds = up to 60km
day/night- class1 signs to be used
all personal to wear Hi Vis Clothing
vehicles to park within the worksite
R.T.A certified traffic controllers to be employed.

Legend
▲ Cone
▨ Work Area

Orange Card Author: Bridget Diggins
Signature: B. Diggins
Certificate No: 0026675150
Date: 28/05/2020

TRUCKS ENTERING ←----
TRUCKS EXITING ←----

NOTE:

ALL TRUCKS SHOULD BE PARKED ONSITE

TRAFFIC CONTROLLER TO ASSIST WITH DELIVERIES TO EACH OF THE GATES

APPENDIX 9: CONSTRUCITON NOISE & VIBRATION MANAGEMENT SUB PLAN

Taylors

Kyeemagh School

Construction Noise and Vibration Management Sub Plan

White Noise Acoustics
303, 74 Pitt Street,
Sydney NSW 2000

ABN: 35 632 449 122

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Document Control

Project Name	**Kyeemagh School**
Project Number	2020096
Document Type	Construction Noise and Vibration Management Sub Plan
Reference Number	20096_200716_CNVMSP_BW_R3
Attention	Shanil Prasad

Revision	**Date**	**Reference Number**	**Drafted By**	**Approved By**
0	16/7/2020	20096_200716_CNVMSP_BW_R0	BW	BW
1	28/7/2020	20096_200716_CNVMSP_BW_R1	BW	BW
2	10/9/2020	20096_200716_CNVMSP_BW_R2	BW	BW
3	16/9/2020	20096_200716_CNVMSP_BW_R3	BW	BW

Table of Contents

1 Introduction

White Noise Acoustics has been engaged to undertake the acoustic assessment of the noise and vibration impacts during the construction stage of the Kyeemagh Public School project.

The assessment has been undertaken in conjunction with the requirements of Item B15 of the projects *Conditions of Consent* and the EPA's Interim Construction Noise Guideline which is detailed in this report.

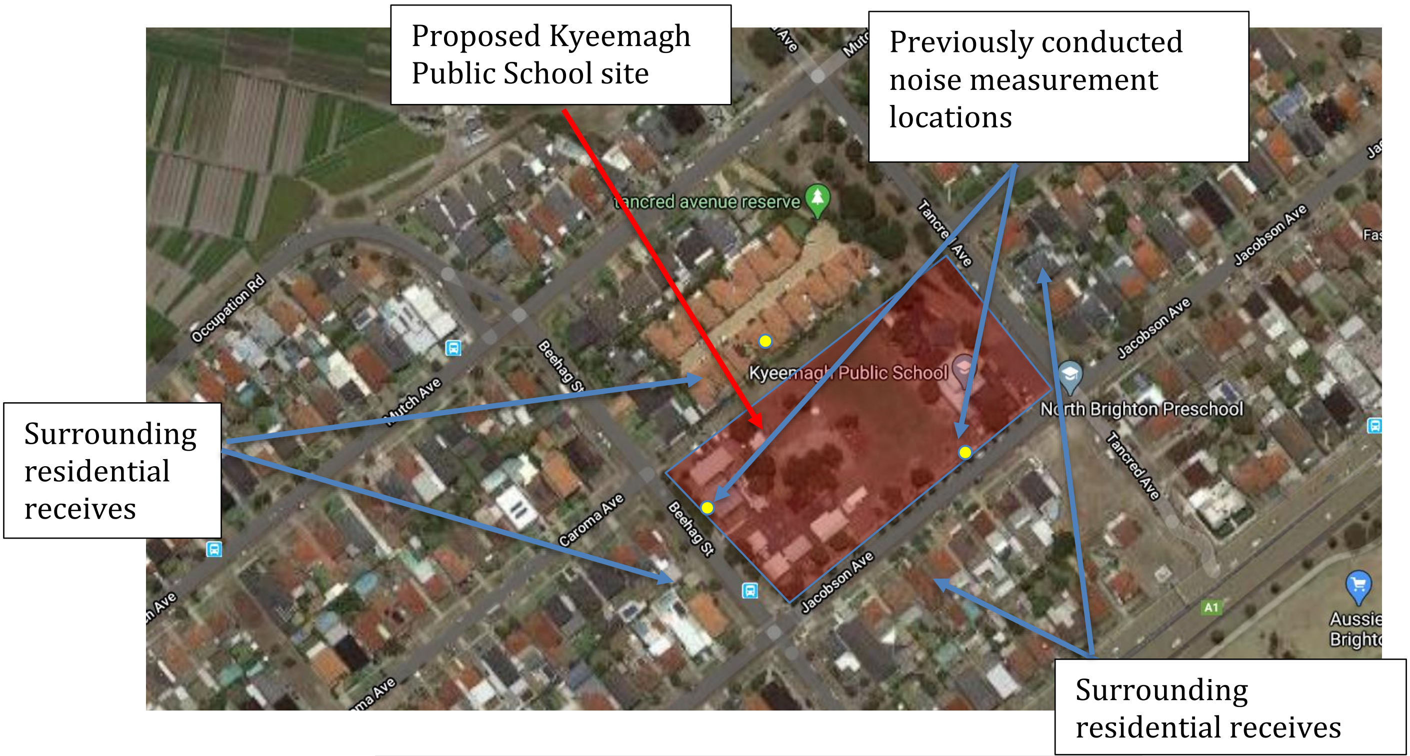
This report includes the recommended noise and vibration mitigations and management controls for the operation of construction activities on the site to ensure impacts to surrounding receivers are minimised.

2 Development Description

The proposed development includes the construction of a Kyeemagh Public School project which is located in the block bound by Jacobson Avenue, Beehag Street and Tancred Avenue Kyeemagh.

The surrounding receivers to the site include residential receivers within proximity to the site.

The site location, in relation to surrounding buildings, is shown in Figure 1 below.



Proposed Kyeemagh Public School site

Previously conducted noise measurement locations

Surrounding residential receives

Surrounding residential receives

Figure 1 – Site Location and Surrounding Receivers

2.1 Conditions of Consent

The management of noise and vibration assassinated with the required construction works to be undertaken as part of the project will be undertaken in conjunction with the requirements of the DA Conditions of Consent, including Item B15 that requires the construction of the project to comply with NSW Dept of Env & Climate Change *"Interim Construction Noise Guideline"* 2009 and includes the following:

> ***B15***
>
> ***Construction Environmental Management Plan***
> *The Construction Noise and Vibration Management Sub-Plan (CNSWMSP) must address, but not be limited to, the following:*
>
> *(a) be prepared by a suitably qualified and experienced noise expert;*
> *(b) describe procedures for achieving the noise management levels in EPA's Interim Construction Noise Guideline (DECC, 2009);*
> *(c) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers;*
> *(d) include strategies that have been developed with the community for managing high noise generating works;*
> *(e) describe the community consultation undertaken to develop the strategies in condition B15(d);*
> *(f) include a complaints management system that would be implemented for the duration of the construction; and*
> *(g) include a program to monitor and report on the impacts and environmental performance of the development and the effectiveness of the management measures in accordance with condition B12(d).*

This report has been undertaken in compliance with the items above and details the required management controls to comply with the Conditions of Consent.

3 Existing Acoustic Environment

The Kyeemagh Public School project is located within the block bond by Jacobson Avenue, Beehag Street and Tancred Avenue Kyeemagh.

Existing environmental noise levels at the site are dominated by traffic noise generated predominantly from surrounding roadways.

As part of this previously conducted *Kyeemagh Infants School, SSDA Noise Impact Assessment* undertaken by SLR and dated January 2019 an assessment of background noise levels has been undertaken, which will be used as the basis of this report. The site survey included the use of two noise monitoring locations which are detailed in Figure 1 above.

3.1 Noise Survey Results

The results of the noise survey undertaken within the *Kyeemagh Infants School, SSDA Noise Impact Assessment* undertaken by SLR and dated January 2019 report have been used as the basis of this assessment and are summarised in Table 1 below.

Table 1 – Results of Noise Survey at the Site

Measurement Location	**Time of Measurement**	**$L_{Aeq, 15min}$ dB(A)**	**$L_{A90, 15min}$ dB(A)**	**Comments**
Location 1 – South East of the site	Daytime	44	56	Noise level at the site dominated by vehicle movements on surrounding roadways
	Evening	51	57	
	Nighttime	41	53	
Location 2 – South West of the site	Daytime	43	56	
	Evening	49	56	
	Nighttime	38	51	

4 Construction Noise and Vibration Assessment

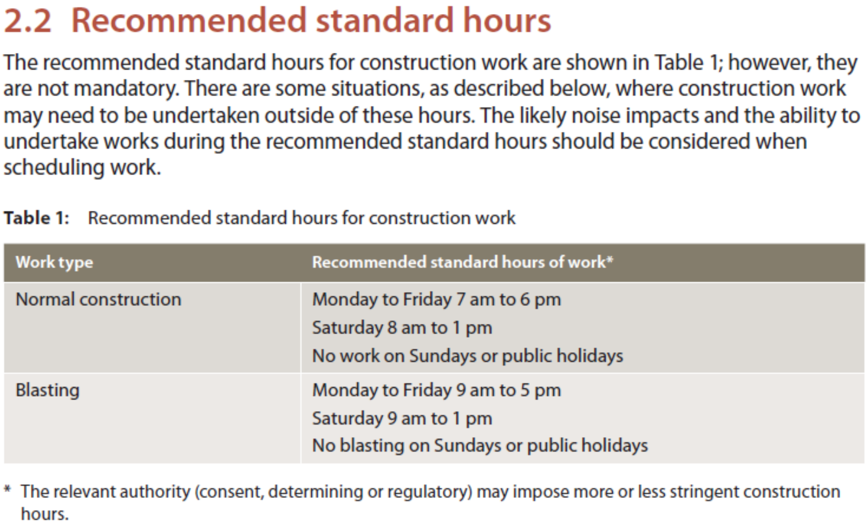
This section of the report details the assessment of noise associated with the proposed construction activities associated with the development. The assessment has been undertaken to assess the potential noise impacts from construction and excavation on surrounding receivers to the site.

The proposed construction and excavation activities to be undertaken on the site include the excavation and construction on the site. The development will then be constructed using normal construction processes.

4.1 Construction Noise

The assessment of construction noise impacts generated from the site has been undertaken in accordance with the requirements of the EAP Interim Construction Noise Guideline.

The EPA's Interim Construction Noise Guideline defines normal day time hours as the following:



2.2 Recommended standard hours

The recommended standard hours for construction work are shown in Table 1; however, they are not mandatory. There are some situations, as described below, where construction work may need to be undertaken outside of these hours. The likely noise impacts and the ability to undertake works during the recommended standard hours should be considered when scheduling work.

Table 1: Recommended standard hours for construction work

Work type	Recommended standard hours of work*
Normal construction	Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays
Blasting	Monday to Friday 9 am to 5 pm Saturday 9 am to 1 pm No blasting on Sundays or public holidays

* The relevant authority (consent, determining or regulatory) may impose more or less stringent construction hours.

4.1.1 Approved Hours of Work

Works on the site will be undertaken in accordance with the requirements of the DA *Conditions of Consent* which will define the normal working hours for the project.

4.2 Proposed Appliances

The proposed appliances which will be used as part of the excavation and construction of the project are detailed in the table below.

Table 2 – Noise Level from Expected Demotion Appliances

Tasks	Equipment	Sound Power Levels per task dB(A) L_{10}	Aggregate Sound Power Level per Task dB(A) L_{10}
Site Excavations	Jack hammer mounted on excavator	118	122
	Saw cutting	119	
	Excavators and bulldozers	115	
	Materials Movements	105	
	Bulldozers	115	
	Trucks	109	
Construction Works	Piling	115	120
	Welder	101	
	Saw cutter	109	
	Dump truck	109	
	Concrete saw	119	
	Power hand tools	109	
	Cranes	110	
Notes: Noise levels of proposed equipment to be used on the site based on the Australian Standard AS2436-2010 and noise level measurements previously undertaken of similar equipment on construction sites.			

4.3 Construction Noise Criteria

This section of the report details the relevant construction noise criteria which is applicable to the site including the EPA's *Interim Construction Noise Guideline* (ICNG).

4.3.1 Interim Construction Noise Guideline

Noise criteria for construction and excavation activities are discussed in the *Interim Construction Noise Guideline* (ICNG). The ICNG also recommends procedures to address potential impacts of construction noise on residences and other sensitive land uses. The main objectives of the ICNG are summarised as follows:

- Promote a clear understanding of ways to identify and minimise noise from construction works;
- Focus on applying all "feasible" and "reasonable" work practices to minimise construction noise impacts;
- Encourage construction to be undertaken only during the recommended standard hours unless approval is given for works that cannot be undertaken during these hours;
- Streamline the assessment and approval stages and reduce time spent dealing with complaints at the project implementation stage; and
- Provide flexibility in selecting site-specific feasible and reasonable work practices in order to minimise noise impacts.

The ICNG contains a quantitative assessment method which is applicable to this project. Guidance levels are given for airborne noise at residences and other sensitive land uses.

The quantitative assessment method involves predicting noise levels at sensitive receivers and comparing them with the Noise Management Levels (NMLs). The NML affectation categories for receivers have been reproduced from the guideline and are listed in the table below.

Table 3 – Noise Management Levels from Construction – Quantitative Assessment

Receiver Type	**Time of Day**	**Noise Management Level LAeq(15minute)1,2**	**How to Apply**
Residential	Recommended standard hours: Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays	Noise affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured LAeq(15minute) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
		Highly noise affected 75 dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences. 2. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
	Outside recommended standard hours	Noise affected RBL + 5 dB	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dB above the noise affected level, the proponent should negotiate with the community.

Table 3 – Continued

Receiver Type	Time of Day	Noise Management Level LAeq(15minute)1,2	How to Apply
Classrooms at schools and other educational institutions	When is use	Internal Noise level 45 dB(A)	During construction, the proponent should regularly update the occupants of the premises regarding noise levels and hours of work.
	Note 1	*Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.*	
	Note 2	*The RBL is the overall single-figure background noise level measured in each relevant assessment period (during or outside the recommended standard hours). The term RBL is described in detail in the NSW Industrial Noise Policy (EPA 2000).*	

Based on the table above the suitable construction noise management levels for works undertaken on the site is detailed in Table 6 below.

Table 4 – Site Construction Noise Management Levels

Noise Source	Time Period	Receiver Type	Construction Noise Management Level[1]	'High Noise Affected' Level[1]
Construction Noise	During period of approved hours of works as detailed within Item 92 of the DA *Conditions of Consent*	Residential Receivers	53 dB(A) LAeq (15min)	75 dB(A) LAeq (15min)
		Education Receivers	Internal Noise level 45 dB(A)	70 dB(A) LAeq (15min)
Note 1: Construction noise management levels based on the Interim Construction Noise Guideline				

4.3.2 Construction Vibration Assessment

This section of the report details the assessment of construction vibration impacts on surrounding receivers.

Effects of ground borne vibration on buildings may be segregated into the following three categories:

- Human comfort – vibration in which the occupants or users of the building are inconvenienced or possibly disturbed. Refer to further discussion in Section 4.4.1.
- Effects on building contents – where vibration can cause damage to fixtures, fittings and other non-building related objects. Refer to further discussion in Section 4.4.2.
- Effects on building structures – where vibration can compromise the integrity of the building or structure itself. Refer to further discussion in Section 4.4.2.

4.3.3 Vibration Criteria – Human Comfort

Vibration effects relating specifically to the human comfort aspects of the project are taken from the guideline titled *"Assessing Vibration – A Technical Guideline"*. (AVTG) This type of impact can be further categorised and assessed using the appropriate criterion as follows:

- Continuous vibration – from uninterrupted sources (refer to Table 5).
- Impulsive vibration – up to three instances of sudden impact e.g. dropping heavy items, per monitoring period (refer to Table 6).
- Intermittent vibration – such as from drilling, compacting or activities that would result in continuous vibration if operated continuously (refer to Table 7).

Table 5 Continuous vibration acceleration criteria (m/s2) 1 Hz-80 Hz

Location	Assessment period	Preferred Values		Maximum Values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Residences	Daytime	0.010	0.0071	0.020	0.014
	Night-time	0.007	0.005	0.014	0.010
Offices, schools, educational institutions and places of worship	Day or night-time	0.020	0.014	0.040	0.028
		0.04	0.029	0.080	0.058
Workshops	Day or night-time	0.04	0.029	0.080	0.058

Table 6 Impulsive vibration acceleration criteria (m/s2) 1 Hz-80 Hz

Location	Assessment period	Preferred Values		Maximum Values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Residences	Daytime	0.30	0.21	0.60	0.42
	Night-time	0.10	0.071	0.20	0.14
Offices, schools, educational institutions and places of worship	Day or night-time	0.64	0.46	1.28	0.92
Workshops	Day or night-time	0.64	0.46	1.28	0.92

Table 7 Intermittent vibration impacts criteria (m/s1.75) 1 Hz-80 Hz

Location	Daytime		Night-time	
	Preferred Values	Maximum Values	Preferred Values	Maximum Values
Residences	0.20	0.40	0.13	0.26
Offices, schools, educational institutions and places of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

4.3.4 Vibration Criteria – Building Contents and Structure

The vibration effects on the building itself are assessed against international standards as follows:

- For transient vibration: British Standard BS 7385: Part 2-1993 “Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration” (BSI 1993); and
- For continuous or repetitive vibration: German DIN 4150: Part 3 – 1999 “Effects of Vibration on Structure” (DIN 1999).

4.3.4.1 Standard BS 7385 Part 2 - 1993

For transient vibration, as discussed in standard BS 7385 Part 2-1993, the criteria are based on peak particle velocity (mm/s) which is to be measured at the base of the building. These are summarised in Table 8 and illustrated in the Figure below.

Table 8 Transient vibration criteria as per standard BS 7385 Part 2 - 1993

Line in Figure below	Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
		4 Hz to 15 Hz	15 Hz and Above
1	Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
2	Unreinforced or light framed structures Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

Standard BS 7385 Part 2 – 1993 states that the values in Table 8 relate to transient vibration which does not cause resonant responses in buildings. Where the dynamic loading caused by continuous vibration events is such as that results in dynamic magnification due to resonance (especially at the lower frequencies where lower guide values apply), then the values in Table 8 may need to be reduced by up to 50% (refer to Line 3 in the Figure below).

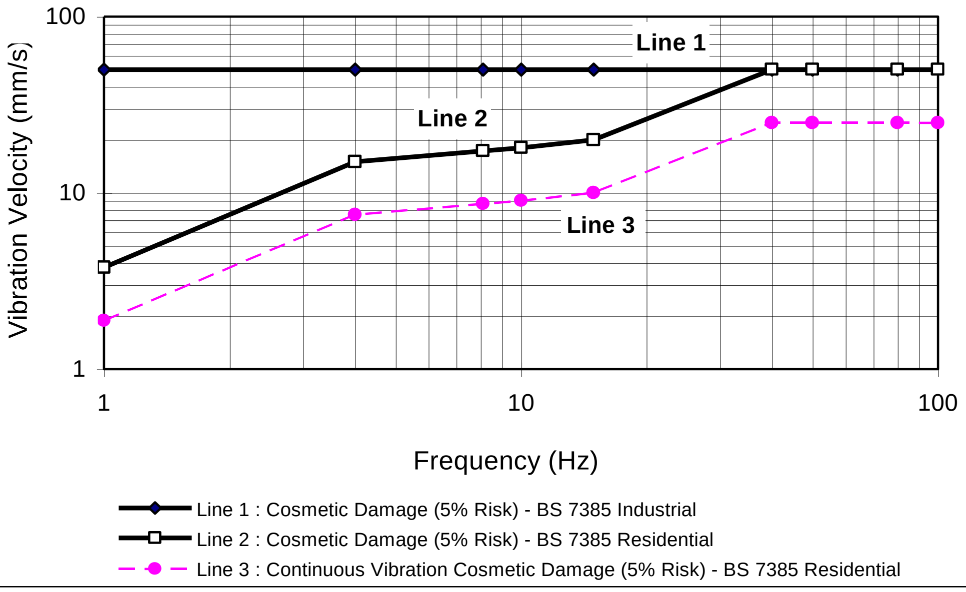


Figure 2 - BS 7385 Part 2 – 1993, graph of transient vibration values for cosmetic damage

In the lower frequency region where strains associated with a given vibration velocity magnitude are higher, the recommended values corresponding to Line 2 are reduced. Below a frequency of 4 Hz where a high displacement is associated with the relatively low peak component particle velocity value, a maximum displacement of 0.6 mm (zero to peak) is recommended. This displacement is equivalent to a vibration velocity of 3.7 mm/s at 1 Hz.

The standard also states that minor damage is possible at vibration magnitudes which are greater than twice those given in Table 8, and major damage to a building structure may occur at values greater than four times the tabulated values.

Fatigue considerations are also addressed in the standard and it is concluded that unless calculation indicates that the magnitude and number of load reversals is significant (in respect of the fatigue life of building materials) then the values in Table 8 should not be reduced for fatigue considerations.

4.3.4.2 Standard DIN 4150 Part 3 - 1999

For continuous or repetitive vibration, standard DIN 4150 Part 3-1999 provides criteria based on values for peak particle velocity (mm/s) measured at the foundation of the building; these are summarised in Table 9. The criteria are frequency dependent and specific to particular categories of structures.

Table 9 Structural damage criteria as per standard DIN 4150 Part 3 - 1999

Type of Structure	Peak Component Particle Velocity, mm/s			
	Vibration at the foundation at a frequency of			Vibration of horizontal plane of highest floor at all frequencies
	1 Hz to 10 Hz	10 Hz to 50 Hz	50 Hz to 100 Hz[1]	
Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
Structures that, because of their sensitivity to vibration, do not correspond to those listed in lines 1 and 2 and are of great intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

Note 1: For frequencies above 100Hz, at least the values specified in this column shall be applied.

4.3.5 Project Vibration Criteria

Based on the details included in the sections above the project specific vibration criteria to protect the surrounding residential receivers from structural or architectural damage includes the following:

1. Project construction vibration criteria at:
    a. Residential Receivers – 10mm/s

4.4 Construction Noise Management

Based on the assessment conducted of the expected construction noise levels generated from the site, levels are generally expected to require the building contractor to engage in management of activities on the site and engagement with the local community.

Notwithstanding, the following management controls are recommended to mitigate construction noise levels on the site:

1. Construction to be undertaken within the approved hours detailed within the projects *Conditions of Consent.*
2. All plant and equipment are to be maintained such that they are in good working order.
3. A register of complaints is to be recorded in the event of complaints being received, including location, time of complaint, nature of the complaint and actions resulting from the complaint.
4. If required a noise level measurement of the offending plant item generating complaints is to be conducted and noise mitigations undertaken to reduce noise levels to within Noise Management levels in the event magnitude of noise levels is found to be above suitable levels.
5. The use of percussive equipment including hydraulic hammering should be limited such that they are not undertaken prior to 7.30am on weekdays and prior to 8.30am on Saturdays.
6. Where possible any excavation to be undertaken on the site is to include ripping of material where possible.

In addition to the recommended mitigations above details of the proposed construction (including excavation) works to be conducted on the site, including type of activities to be conducted as well as the expected duration of activities should be provided to the neighbouring receivers.

In the event noise levels are found to required additional noise reduction then all possible and practical mitigations are required to be included in the construction of the project. Possible acoustic treatments and controls may include the following:

1. Use of alternative appliances to complete the required works which result in reduced noise impacts on surrounding neighbours.
2. Period when noisy appliances are undertaken, such as undertaking noisy works on locations with the greatest distance to residential receivers during morning periods if possible.
3. Construction of acoustic screening to permanently located high noise generating equipment such as pumps and generators.
4. Scheduling of high noise generating works outside of noise sensitive periods if possible.
5. Other site specific treatments and controls which may become possible once works commence.

4.5 Construction Vibration Impacts

An assessment of the potential for vibration generated as part of the required construction activities on the project (including excavation and construction) has been undertaken.

As the proposed building to be demolished on the site are not attached to neighbouring structures and the proximity of neighbouring structures to the development site (which include residential receives) vibration levels generated from the proposed excavation and construction on the site are expected to comply with all vibration criteria detailed in this report.

In the event that vibration rolling or compacting of ground conditions is required within 10m of neighbouring buildings than attended vibration measurements during the use of this equipment should be undertaken to ensure vibration does not result in unreasonable levels of vibration impact on the neighbouring building structures.

Based on the location of the site and the proximity of the surround buildings vibration generated from proposed construction activities on the site are not expected to result in magnitudes approaching the project vibration criteria detailed in Section 4.5.3.

4.6 Noise and Vibration Monitoring

As part of the management of noise from the proposed excavation and construction activities to be undertaken on the site the following noise and vibration measurements are recommended to be undertaken:

1. Noise – Attended noise level measurements of typical excavation and construction activities should be undertaken at site. A

   Attended construction noise surveys of the site and surrounding impacts on neighbours should be undertaken during the following as a minimum:
   a. Commencement of any rock breaking or sawing on the site.
   b. In response to any ongoing complaints received from neighbours.

2. Vibration – Based on the proximity of the surrounding receivers to the works magnitudes of vibration resulting from construction activities required to be undertaken on the site are not expected to approach vibration limits detailed in Section 4.5.3 of this report, therefore vibration monitoring is not recommended.

   Attended vibration measurements could be undertaken at a receiver location in the event complaints resulting from construction activities resulting from the perception of vibration are experienced by the occupants of buildings within the vicinity of the site.

5 Community Engagement

During the proposed construction of the project (including excavation and construction) the building contractor is required to engage in community interaction. The community interaction and notification is required to include the following:

1. Notification of the proposed works to be undertaken on the site and the periods when works will be conducted, including information regarding the programme of works such as excavation. This should include the expected period when activities such as hydraulic hammering, rock breaking, concrete or rock sawing is required to be undertaken.
2. Details of the relevant site representative where complaints can be registered.
3. Details of the methodology to respond to complaints raised from the surrounding receivers.
4. A register of complaints, to be kept on site including record of time and nature of the complaint as well as the outcomes and comments regarding investigations resulting from the complaint.

Engagement with the community has been undertaken (as required by Items 15 d) and e) of the consent) to include the mitigation of noise from the high noise works. This includes the strategies detailed in the *Community Communication Strategy* which is included in Appendix C and includes Table 4 for the engagement of the community regarding construction noise generated from the site (including high noise works).

5.1 Community Consultation

Community consultation has been and will continue to be undertaken in accordance with the *Community Communication Strategy* which is included in Appendix C.

5.2 Contingency Plans

In the event noise or vibration complaints are received from surrounding receivers the following methodology to assess impacts from the construction activities will be undertaken:

1. Review processes being conducted on the site and identify the item of plant or activity generating the source of the noise.
2. Assess the works being conducted and implement possible and practical mitigations to the item identified in the point above including work practices (alternatives), location of works, time when works are being conducted. Mitigations will include possible and practical methods when possible.
3. Detail a response to activity including noise monitoring/measurements if required.

6 Conclusion

This report details the construction noise and vibration assessment of the proposed construction of the proposed Kyeemagh Public School project.

An assessment of noise and vibration impacts from the required processes to be undertaken during the construction period of the project (including excavation and construction) has been undertaken and suitable treatments, management controls, perioding measurements and community engagement has been detailed in this report.

Providing the recommendations in this report are included in the construction of the site, compliance with the relevant EPA's Interim Construction Noise Guideline and Item B15 of the propjets *Conditions of Consent* will be achieved.

For any additional information please do not hesitate to contact the person below.

Regards

BG White

Ben White
Director
White Noise Acoustics

7 Appendix A – Glossary of Terms

Ambient Sound	The totally encompassing sound in a given situation at a given time, usually composed of sound from all sources near and far.
Audible Range	The limits of frequency which are audible or heard as sound. The normal ear in young adults detects sound having frequencies in the region 20 Hz to 20 kHz, although it is possible for some people to detect frequencies outside these limits.
Character, acoustic	The total of the qualities making up the individuality of the noise. The pitch or shape of a sound's frequency content (spectrum) dictate a sound's character.
Decibel [dB]	The level of noise is measured objectively using a Sound Level Meter. The following are examples of the decibel readings of every day sounds; 0dB the faintest sound we can hear 30dB a quiet library or in a quiet location in the country 45dB typical office space. Ambience in the city at night 60dB Martin Place at lunch time 70dB the sound of a car passing on the street 80dB loud music played at home 90dB the sound of a truck passing on the street 100dB the sound of a rock band 115dB limit of sound permitted in industry 120dB deafening
dB(A)	*A-weighted decibels* The ear is not as effective in hearing low frequency sounds as it is hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter. The sound pressure level in dB(A) gives a close indication of the subjective loudness of the noise.
Frequency	Frequency is synonymous to *pitch*. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Loudness	A rise of 10 dB in sound level corresponds approximately to a doubling of subjective loudness. That is, a sound of 85 dB is twice as loud as a sound of 75 dB which is twice as loud as a sound of 65 dB and so on
L_{Max}	The maximum sound pressure level measured over a given period.
L_{Min}	The minimum sound pressure level measured over a given period.
L_1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L_{10}	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L_{90}	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L_{90} noise level expressed in units of dB(A).
L_{eq}	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
Background Sound Low	The average of the lowest levels of the sound levels measured in an affected area in the absence of noise from occupants and from unwanted, external ambient noise sources. Usually taken to mean the L_{A90} value
Ctr	A frequency adaptation term applied in accordance with the procedures described in ISO 717.
dB (A)	'A' Weighted overall sound pressure level

Noise Reduction	The difference in sound pressure level between any two areas. The term “noise reduction” does not specify any grade or performance quality unless accompanied by a specification of the units and conditions under which the units shall apply
NR Noise Rating	Single number evaluation of the background noise level. The NR level is normally around 5 to 6 dB below the “A” weighted noise level. The NR curve describes a spectrum of noise levels and is categorised by the level at 1000 Hz ie the NR 50 curve has a value of 50 dB at 1000 Hz. The NR rating is a tangential system where a noise spectrum is classified by the NR curve that just encompasses the entire noise spectrum consideration.
R_w	Weighted Sound Reduction Index - Laboratory test measurement procedure that provides a single number indication of the acoustic performance of a partition or single element. Calculation procedures for Rw are defined in ISO 140-2:1991 “Measurement of Sound Insulation in Buildings and of Building Elements Part 2: Determination, verification and application of precision data”.
R'_w	Field obtained Weighted Sound Reduction Index - this figure is generally up to 3-5 lower than the laboratory test determined level data due to flanked sound transmission and imperfect site construction.
Sound Isolation	A reference to the degree of acoustical separation between any two areas. Sound isolation may refer to sound transmission loss of a partition or to noise reduction from any unwanted noise source. The term “sound isolation” does not specify any grade or performance quality and requires the units to be specified for any contractual condition
Sound Pressure Level, L_P *dB*	A measurement obtained directly using a microphone and sound level meter. Sound pressure level varies with distance from a source and with changes to the measuring environment. Sound pressure level equals 20 times the logarithm to the base 10 of the ratio of the rms sound pressure to the reference sound pressure of 20 micro Pascals.
Sound Power Level, L_w *dB*	Sound power level is a measure of the sound energy emitted by a source, does not change with distance, and cannot be directly measured. Sound power level of a machine may vary depending on the actual operating load and is calculated from sound pressure level measurements with appropriate corrections for distance and/or environmental conditions. Sound power levels is equal to 10 times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 picoWatt
Speech Privacy	A non-technical term but one of common usage. Speech privacy and speech intelligibility are opposites and a high level of speech privacy means a low level of speech intelligibility. It should be recognised that acceptable levels of speech privacy do not require that speech from an adjacent room is inaudible.
Transmission Loss	Equivalent to Sound Transmission Loss and to Sound Reduction Index in terminology used in countries other than Australia. A formal test rating of sound transmission properties of any construction, by usually a wall, floor, roof etc. The transmission loss of all materials varies with frequency and may be determined by either laboratory or field tests. Australian Standards apply to test methods for both situations.

8 Appendix B – CV of Ben White

Curriculum Vitae – Benjamin White

58 Carrington Road, Randwick
NSW 2031

Employment Experience:

Director - White Noise Acoustics: March 2019 – Present

Director/Engineer - Acoustic Logic Consultancy: March 2001 – July 2018

Experience:

Ben White the Director of White Noise has over 17 years of experience in acoustic.

Ben has significant experience in providing acoustic services and expert advice in the following areas:

- Residential acoustic reports including aircraft noise (AS2021) assessments, traffic noise, train noise and vibration assessments.
- Noise emission assessments for various projects including assessments with planning requirements using EPA, Department of Planning, Council DCP's and similar regulatory requirements.
- Planning approvals including Development Applications for multi dwelling residential developments, commercial developments, hotels and boarding houses, places of entertainment, carparks, mixed use developments, shopping centres and the like.
- Expert court witness including Land and Environment Court and other expert witness work.
- Project planning and specifications for types of projects including residential, commercial, retail, hotel accommodation, warehouses and industrial developments and mixed-use projects.
- Project delivery for all types of projects including, design advice and project delivery requirements at all stages of projects during design and construction.
- Certification works including on site testing for the provision of certification of all types of projects including items required to comply with Part F5 of the BCA as well as project specific acoustic requirements.
- Mechanical design and advice for the treatments of mechanical services with project requirements.
- External façade design and specification.
- Specialised acoustic design advice including areas of projects.
- Issues with existing building include site surveys and audits as well as advice regarding rectification if required.

9 Appendix C – Community Consultation Strategy

July 2020

School Infrastructure NSW

Community Communication Strategy

Upgrade to Kyeemagh Public School

Contents

Document Purpose

This Community Communication Strategy (CCS) has been developed to:

- Successfully consider and manage stakeholder and community expectations as integral to the successful delivery of the project.
- Outline interfaces with other disciplines, including safety, construction, design and environment, to ensure all activities are co-ordinated and drive best practice project outcomes.
- Inform affected stakeholders, such as the local community or road users about construction activities.
- Provide a delivery strategy which enables the open and proactive management of issues and communications.
- Highlight supporting procedures and tools to enable the team to deliver this plan effectively.
- Provide support for the broader communications objectives of School Infrastructure NSW (SINSW), including the promotion of the project and its benefits.

This Community Consultation Strategy (CCS) will be implemented through the design and construction phase of the project, and for 12 months following construction completion. Table 1 below lists the communication and engagement requirements outlined in the State Significant Development (SSD) application consent conditions.

Plan review

The CCS will be revised regularly to address any changes in the project management process, comments and feedback by relevant stakeholders, and any changes identified as a result of continuous improvement undertakings. This will be done in close consultation with the SINSW Senior Project Director, appointed Project Management Company and/or Contractor and SINSW Community Engagement Manager.

Approval

The CCS is reviewed and approved by the SINSW Senior Project Director, in close consultation with Schools Operations and Performance, with final endorsement from the SINSW Community Engagement Senior Manager before being submitted to the Planning Secretary for information.

Table 1: List of SSD application consent conditions for communication and engagement and where they are addressed in this strategy

Consent conditions for communication and engagement	The CCS addresses this in section
Identify people to be consulted during the design and construction phase	▪ Section 4 ▪ Section 5
Set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development	▪ Section 6 ▪ Section 7 ▪ Section 8.4
Provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development	▪ Section 4
Set out procedures and mechanisms: ▪ Through which the community can discuss or provide feedback to the Applicant	▪ Section 4 ▪ Section 6 ▪ Section 8.5
Set out procedures and mechanisms: ▪ Through which the Applicant will respond to enquiries or feedback from the community; and	▪ Section 8.5
Set out procedures and mechanisms: ▪ To resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation	▪ Section 8.5

1. Context

The NSW Government is investing $6.7 billion over four years to deliver more than 190 new and upgraded schools to support communities across NSW. In addition, a record $1.3 billion is being spent on school maintenance over five years, along with a record $500 million for the sustainable Cooler Classrooms program to provide air conditioning to schools. This is the largest investment in public education infrastructure in the history of NSW.

School Infrastructure NSW is redeveloping Kyeemagh Public School to provide additional new permanent learning spaces and upgraded core facilities to meet the school's enrolment growth.

The benefits

- New flexible learning spaces.
- A new staff/administration area.
- A new library.
- A new hall.
- New amenities.
- A new canteen.
- A new covered outdoor learning area (COLA).

The Kyeemagh Public School upgrade is classified as a State Significant Development, and has been assessed by the Department of Planning, Industry and Environment (DPIE). Consent was provided on 16 July 2020.

DPIE's web page on the project is here.

2. Community Engagement Objectives

SINSW’s mission is to provide school infrastructure solutions by working collaboratively with all our stakeholders to create learning environments across NSW that serve our future needs and make us all proud.

This CCS has been developed to achieve the following community engagement objectives:

- Promote the benefits of the project
- Build key school community stakeholder relationships and maintain goodwill with impacted communities
- Manage community expectations and build trust by delivering on our commitments
- Provide timely information to impacted stakeholders, schools and broader communities
- Address and correct misinformation in the public domain
- Reduce the risk of project delays caused by negative third party intervention
- Leave a positive legacy in each community.

3. Key Messages

Through each phase of the project, the key messages, community engagement plan, and means of engagement will be regularly reviewed, refined and updated. Information that is currently in the public domain is outlined below.

3.1. High level messaging

The NSW Government is investing $6.7 billion over four years to deliver more than 190 new and upgraded schools to support communities across NSW. In addition, a record $1.3 billion is being spent on school maintenance over five years, along with a record $500 million for the sustainable Cooler Classrooms program to provide air conditioning to schools. This is the largest investment in public education infrastructure in the history of NSW.

3.2. Project messaging

3.2.1. Project status

The State Significant Development Application has been assessed by the Department of Planning, Industry & Environment (DPIE) and consent has been granted.

3.2.2. Project benefits

School Infrastructure NSW is redeveloping Kyeemagh Public School to provide additional new permanent learning spaces and upgraded core facilities to meet the school’s enrolment growth.

The benefits:

- New flexible learning spaces.
- A new library.
- A new hall.
- New amenities.
- A new canteen.
- A new covered outdoor learning area (COLA).
- A new staff/administration area.

3.2.3. High-quality learning environment

The project will provide state-of-the-art classrooms and learning spaces that make use of the latest technology to enhance the learning experience for the next generation of students. The contemporary and sustainable facilities provide an outstanding working environment for school staff.

Flexible learning spaces are adaptable to accommodate small or large groups and facilitate students’ use of modern technology, while working independently and collaboratively.

3.2.4. Environmental benefits

The school will be upgraded in accordance with current sustainability principles. School Infrastructure NSW is committed to environmentally conscious construction and maintenance practices.

3.3. Construction phase

3.3.1. Safety

School Infrastructure NSW is committed to ensuring that work is completed safely and efficiently and with minimal impact to the local community. Prior to construction starting, any hazardous material is required to be removed from the site. This work will be carried out in accordance with regulatory requirements including the provisions of SafeWork NSW.

3.3.2. Traffic management

The construction contractor has developed a Traffic Management Plan to ensure that vehicle movements are managed with minimal disruption to the local community. All construction vehicles (excluding worker vehicles) are to be contained wholly within the site, except if located in an approved on-street work zone, and vehicles must enter the site before stopping.

3.3.3. Noise, vibration and dust

Any activity that could exceed approved construction noise management levels will be managed in strict accordance with the Protection of the Environment Operations Act 1997.

All works will be conducted in accordance with the Contractor’s approved Construction Noise Management Sub-Plan. Vibration from works will be minimal and kept within acceptable levels of the document ‘Assessing Vibration: a technical guideline’ which outlines vibration criteria for day time periods.

Mitigation measures will be in place to manage noise and dust levels, including hoarding to minimise the effects of noise and dust and hosing down as required to ensure the safety of the school and local community.

Construction, including the delivery of materials to and from the site, may only be carried out between the following hours:

(a) between 7:00am and 6:00pm, Mondays to Fridays inclusive; and

(b) between 8:00am and 1:00pm, Saturdays.

No work may be carried out on Sundays or public holidays.

Soil remediation activities, may only be carried out between the following hours:

(a) between 7:00am and 6:00pm Mondays to Saturdays inclusive.

No soil remediation activities may be carried out on Sundays or public holidays.

Construction activities may be undertaken outside of the above hours if required:

(a) by the Police or a public authority for the delivery of vehicles, plant or materials; or

(b) in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or

(c) where the works are inaudible at the nearest sensitive receivers; or

(d) where a variation is approved in advance in writing by the Planning Secretary or his nominee if appropriate justification is provided for the works.

Notification of such construction activities as soil remediation or out of hours must be given to affected residents before undertaking the activities or as soon as is practical afterwards.

Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours:

(a) 9:00am to 12:00pm, Monday to Friday;

(b) 2:00pm to 5:00pm Monday to Friday; and

(c) 9:00am to 12:00pm, Saturday.

3.3.4. Fauna and vegetation

School Infrastructure NSW is committed to ensuring construction work has a minimal impact upon fauna and vegetation.

School Infrastructure NSW will comply with all Development Consent Conditions relating to the protection of fauna and vegetation, and will comply with all relevant mitigation measures listed in the Environmental Impact Statement (EIS).

Prior to construction, a Construction Environmental Management Plan (CEMP) will be prepared to govern the completion of all construction works. The CEMP will detail measures to be taken for the protection and management of fauna and vegetation, will be prepared in accordance with relevant guidelines and performance indicators, and will be prepared to the satisfaction of DPIE.

Prior to the commencement of construction and/or vegetation clearing (whichever occurs first), pre clearing surveys and inspections for fauna will be undertaken. The surveys and inspection, and any subsequent relocation of fauna, will be undertaken under the guidance of a suitably qualified ecologist and must be in accordance with the methodology incorporated in a Biodiversity Management Sub-Plan. Evidence of the pre clearing surveys and inspections for fauna and any relocation of fauna must be provided to the satisfaction of the Certifying Authority.

A Vegetation Management Sub Plan will also be prepared to carefully manage the impact to fauna and vegetation during construction. Additionally, a Landscape Plan will be prepared prior to construction, which will include, amongst other important measures, provision for the planting of more than 60 trees, shrubs and groundcover. Importantly, a number of trees to be removed will be incorporated into the landscape design and used in the remnant vegetation on site to enhance habitat including tree hollows and tree trunks (greater than 25-30cm in diameter and 3m in length).

3.3.5. Soil and water

School Infrastructure NSW is committed to the appropriate management of soil and water on the construction site.

School Infrastructure NSW will comply with all Development Consent Conditions relating to soil and water management, and will comply with all relevant mitigation measures listed in the EIS.

Prior to construction, a CEMP will be prepared to govern the completion of all construction works. The CEMP will detail measures for the management of soil and water, will be prepared in accordance with relevant guidelines and performance indicators, and will be prepared to the satisfaction of the DPIE.

A suitably qualified and experienced consultant will prepare a Construction Soil and Water Management Sub-Plan (CSWMSP), which will form part of the CEMP. The CSWMSP will:

- describe erosion and sediment control measures to be implemented during construction
- provide a plan of how construction works will be managed in wet-weather events
- detail flows from the site to surrounding area
- describe the measures to be taken to manage stormwater and flood flows for small and large sized events
- include an Acid Sulfate Soils Management Plan (if required).

Erosion and sediment controls will be installed and maintained in accordance with the "Blue Book" – *Managing Urban Stormwater: Soils and Construction (4th edition)*. These controls will be implemented prior to the commencement of any other site disturbance works.

A rainwater harvesting system will be installed onsite and used onsite during construction. Approval will be obtained prior to the discharge of onsite stormwater to Council's stormwater drainage system or street gutter.

Only approved soil and fill types will be used onsite. Accurate records will be kept on the volume and type of fill used onsite.

3.3.6. Contamination

Prior to construction, a CEMP will be prepared to govern the completion of all construction works. The CEMP will detail contamination management measures, will be prepared in accordance with relevant guidelines and performance indicators, and will be prepared to the satisfaction of the DPIE.

The project site has been tested for contamination and some remediation work will be required prior to the commencement of the main works construction for the school upgrade.

The CEMP will include protocols for the management of unexpected contamination discovered during the course of construction works.

3.3.7. Visual amenity

Prior to construction, a CEMP will be prepared to govern the completion of all construction works. The plan will detail measures to maintain visual amenity, will be prepared in accordance with relevant guidelines and performance indicators, and will be prepared to the satisfaction of the DPIE.

The CEMP will include provisions for the management of outdoor lighting. The installation and operation of outdoor lighting will comply with both AS 4282-2019 – Control of the Obtrusive Effects of Outdoor Lighting and AS 1158.3.1-2005 – Lighting for Roads and Public Spaces – Part 3.1: Pedestrian Area (Category P) Lighting.

Visual amenity impacts will be limited during construction via the installation of appropriate site fencing and adherence to site housekeeping procedures.

3.3.8. Heritage

Prior to construction, a CEMP will be prepared to govern the completion of all construction works. The plan will detail measures to protect heritage matters, will be prepared in accordance with relevant guidelines and performance indicators, and will be prepared to the satisfaction of the DPIE.

The CEMP will include unexpected finds protocols for objects of Aboriginal or Historic heritage.

In the event that relics of Aboriginal heritage are discovered, all works in the immediate area will cease immediately, and consultation will occur with a suitably qualified archaeologist, registered Aboriginal representatives and DPIE to determine an appropriate management strategy.

In the event that relics of historic heritage are discovered, all works in the immediate area will cease immediately, and consultation will occur with DPIE to determine an appropriate management strategy.

3.3.9. Disruptive works

Construction work for the Kyeemagh Public School project is underway. The following activities are planned for the upcoming weeks (*works will be outlined*). You can contact us directly using the details below to discuss any aspect of this work.

3.3.10. Get involved

We are committed to working together with our school communities and other stakeholders to deliver the best possible learning facilities for students. Your feedback is important to us. For more information contact us via the details below.

- Email: schoolinfrastructure@det.nsw.edu.au
- Website: schoolinfrastructure.nsw.gov.au
- Phone: 1300 482 651

3.4. Handover phase

3.4.1. Traffic and access

Construction work on the Kyeemagh Public School project has been completed. We are now in a position to confirm access provisions for the new school, including pick-up and drop-off arrangements.

3.5. Official school opening

A redevelopment of Kyeemagh Public School was completed today, and delivered brand new facilities including:

- new flexible learning spaces
- a new staff/administration area
- a new library
- a new hall
- new amenities
- a new canteen
- a new covered outdoor learning area (COLA).

Thank you for your patience during construction and we are thrilled to deliver this project for the school community.

4. Project Governance

4.1. Project Reference Group

The Department's engagement process strives to engage with key stakeholders from the school community. As part of this process, a Project Reference Group (PRG) is established early in the project with nominated representatives from the school community to ensure input from, and consultation with, impacted stakeholders.

The PRG provides key information from an operational, educational, change and logistics perspective into the planning, through the design and construction phases of the project.

The PRG will receive project briefings and key progress updates on project progress to support its responsibilities in assisting to communicate updates to school staff, parents and stakeholders in the wider local community.

The Project Reference Group will be conducted as two separate groups during the development and delivery of all projects:

(a) Project Reference Group – Planning

A nominated group (limited to 10) will participate in workshops to develop the Educational Principles and Education Rationale which will inform the Functional Design Brief. These workshops are chaired by the SINSW Senior Project Director (or delegate) and may be facilitated by an Education Consultant. This activity will inform the development of the building design.

(b) Project Reference Group – Delivery

The purpose of the group is to seek input and inform design processes and provide operational requirements and information to help minimise the impact of the project on school operations. These workshops are chaired by the Senior Project Director (or delegate) and may be facilitated by the appointed architectural consultant, as required. The PRG will provide key information from an operational and logistics perspective to assist project delivery.

Specifically to communications and engagement related matters, the PRG will also:

- Provide a forum for discussion and exchange of information relating to the planning and delivery of the project
- Identify local issues and concerns to assist the project team with the development of mitigation strategies – to manage and minimise construction and environmental impacts to the school community and local residents
- Provide feedback to the communications and community engagement team on key messages and communications and engagement strategies
- Provide advice on school engagement activities
- Assist to disseminate communications to the school community and other stakeholders.

As per all department led delivery projects, the PRG acts as a consultative forum and not a decision-making forum for the planning and delivery of this school infrastructure.

Figure 1: Project Reference Group (PRG)

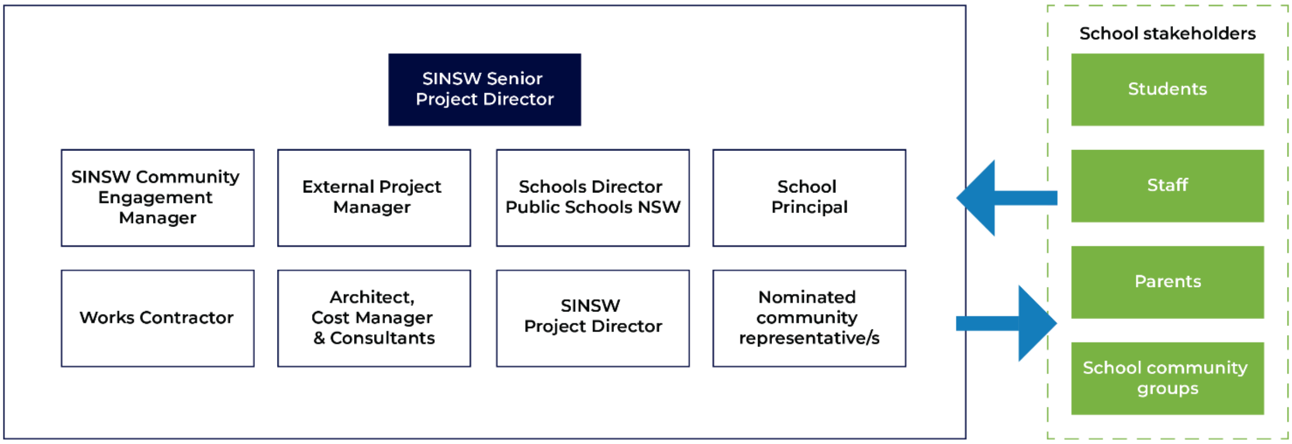
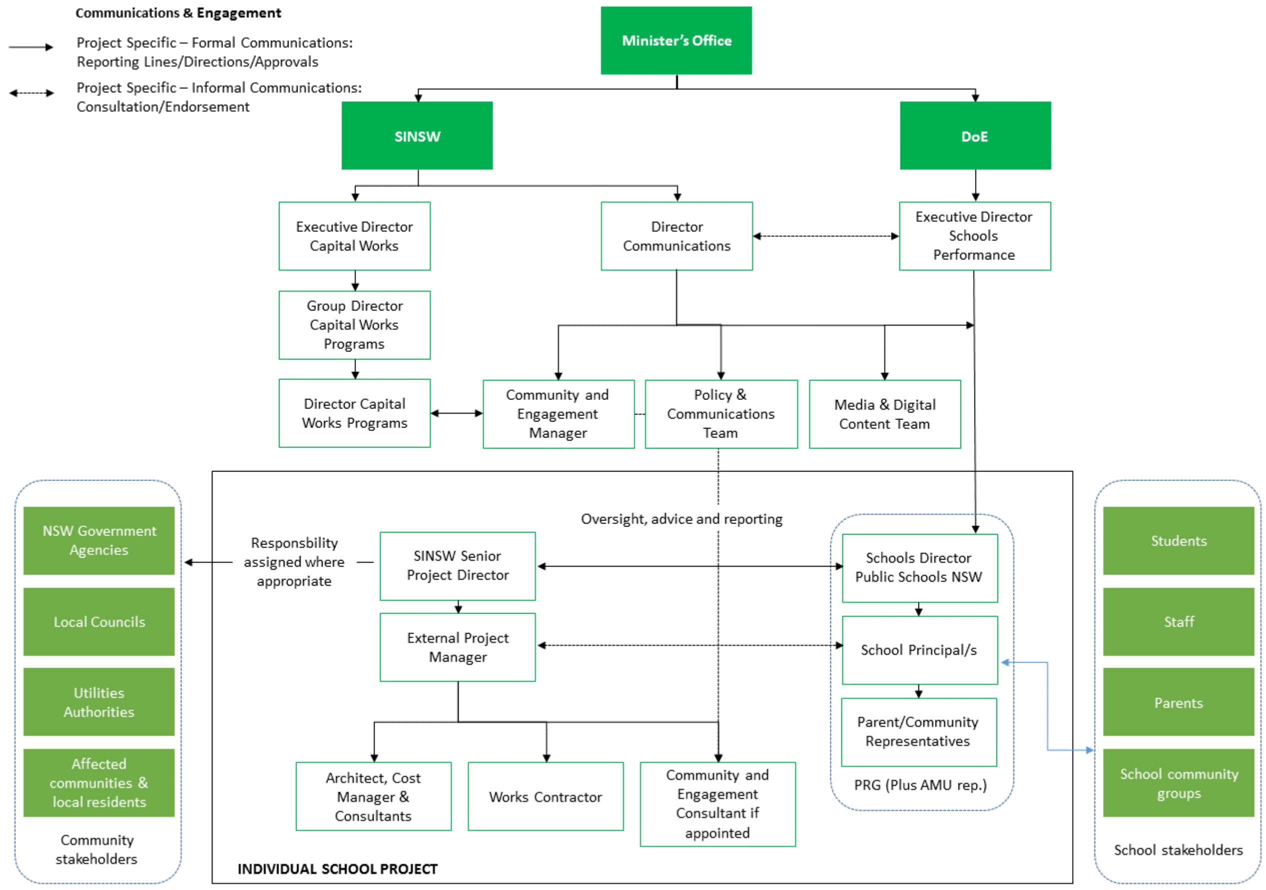


Figure 2 below maps how the department and SINSW will communicate both internally and externally.

Figure 2: SINSW Project Governance



5. Stakeholders

The stakeholder list below summarises who will be consulted during the design and construction phase via ongoing face to face meetings, communications collateral and digital engagement methods.

Table 2: Stakeholders

Stakeholders	Interest and involvement
Local Members of Parliament: ▪ Stephen Kamper, NSW Member for Rockdale ▪ Hon. Linda Burney MP	▪ Meeting the economic, social and environmental objectives of state and federal governments ▪ Delivering increased public education capacity on time ▪ Delivering infrastructure that meets expectations ▪ Addressing local issues such as traffic, congestion and public transport solutions
Government agencies and peak bodies: ▪ Transport for NSW, including Roads and Maritime Services NSW ▪ Fire and Rescue NSW ▪ NSW Department of Education ▪ NSW Department of Planning, Industry and Environment ▪ NSW Environmental Protection Authority ▪ NSW Rural Fire Service ▪ Sydney Water ▪ NSW Heritage Council ▪ NSW Office of Environment, Energy and Science ▪ NSW Department of Premier and Cabinet	▪ Traffic and congestion on the local road system ▪ Adequate public transport options and access ▪ Ensuring new infrastructure meets standard requirements for safety and fire evacuation ▪ Ensuring the development is compliant ▪ Ensuring the development does not impact heritage items ▪ Easing overcrowding in local schools
Cultural and heritage interest: ▪ La Perouse Local Aboriginal Land Council ▪ Local heritage groups	▪ Discovery of cultural and heritage artefacts during construction
Local Council – Bayside City Council ▪ Mayor, Joe Awada ▪ General Manager, Meredith Wallace ▪ Councillors	▪ Schedule for construction and opening of school ▪ Impacts to the local community including noise, congestion and traffic ▪ Shared use of community spaces ▪ Providing amenities to meet increase population density
School community ▪ Principal ▪ Teachers ▪ Staff ▪ Parents and carers ▪ Students	▪ Safe pedestrian and traffic access to the temporary school during construction ▪ Plans for enrolled students as the school expands ▪ Construction impacts and how these will be minimised ▪ Quality of infrastructure and resources upon project completion ▪ How to access the new school once completed

Stakeholders	Interest and involvement
Nearby public schools ▪ Arncliffe West Infants School ▪ Arncliffe Public School ▪ Rockdale Public School ▪ Brighton-Le-Sands Public School ▪ Botany Public School ▪ Bexley Public School ▪ St Francis Xavier's Catholic Primary School ▪ Cairnsfoot Special Education School ▪ St Thomas More's Catholic School ▪ St George Special Education School ▪ North Brighton Preschool	▪ Impact on school resources ▪ Impact on current students ▪ Implications for teaching staff ▪ Possible impacts on enrolments and catchment area ▪ Opportunities to view the new facilities
Adjoining affected landowners and businesses Four residential streets adjacent to the school (Tancred Ave, Jacobson Ave, Beehag St, Owen Ave) There are no registered businesses in the direct vicinity.	▪ Noise and truck movements during construction ▪ Increased traffic and congestion on nearby streets ▪ Local traffic and pedestrian safety ▪ Changed traffic conditions during pick-up and drop-off ▪ Shared use of school facilities and amenities ▪ Environmental impacts during construction ▪ Visual amenity
Community groups ▪ Rockdale Bushcare ▪ Rockdale Wetlands Preservation Society ▪ Botany Bay and Catchment Alliance ▪ St George Family Support Services Inc	▪ Noise and truck movements during construction ▪ Increased traffic and congestion on nearby streets ▪ Local traffic and pedestrian safety ▪ Changed traffic conditions during pick-up and drop-off ▪ Shared use of school facilities and amenities

6. Engagement Approach

From 30 March 2020, the way we communicate has temporarily changed, please refer to Appendix A for a detailed up to date list of changed communication methods and tools. This particularly refers to face to face communication channels such as door knocks, information booths/sessions, face to face meetings and briefings.

The key consideration in delivering successful outcomes for this project is to make it as easy as possible for anyone with an interest to find out what is going on. In practice, the communications approach across all levels of engagement will involve:

- Using uncomplicated language
- Taking an energetic approach to engagement
- Encouraging and educating whenever necessary
- Engaging broadly including with individuals and groups that fall into harder to reach categories
- Providing a range of opportunities and methods for engagement
- Being transparent
- Explaining the objectives and outcomes of planning and engagement processes.

In addition to engagement with government departments and agencies and the local council, two distinct streams of engagement will continue for the project as follows:

- School community for existing schools being upgraded, or surrounding schools for new schools, and
- Broader local community.

This allows:

- School-centric involvement from school communities (including students, parents/caregivers, teachers, admin staff) unencumbered by broader community issues, and
- Broad community involvement unencumbered by school community wants and needs. Broad community stakeholders include local residents, neighbours and local action groups.

6.1. General community input

Members of the general public impacted by the construction phase are able to enquire and complain about environmental impacts via the following channels:

- Information booths and information sessions held at the school or local community meeting place, and advertised at least 7 days before in local newspapers, on our website and via letterbox drops
- 1300 number that is published on all communications material, including project site signage
- School Infrastructure NSW email address that is published on all communications material, including project site signage

Refer to Section 8.5 of this document for detail on our enquiries and complaints process.

A number of tools and techniques will be used to keep stakeholders and the local community involved as summarised in table 3 below.

For reference, project high level milestones during the delivery phase include:

- Site establishment/early works
- Commencement of main works construction
- Term prior to project completion
- Project completion
- First day of school following project completion
- Official opening

Table 3: School Infrastructure NSW Communications Tools

Communications Tool	Description of Activity	Frequency
1300 community information line	The free call 1300 482 651 number is published on all communication materials and is manned by SINSW. All enquiries that are received are referred to the appointed C&E Manager and/or Senior Project Director as required and logged in our CRM. Once resolved, a summary of the conversation is updated in the CRM.	Throughout the life of the project and accessible for 12 months post completion
Advertising (print)	Advertising in local newspapers is undertaken with at least 7 days' notice of significant construction activities, major disruptions and opportunities to meet the project team or find out more at a face to face event.	At project milestones or periods of disruption
Call centre scripts	High level, project overview information provided to external organisations who may receive telephone calls enquiring about the project, most namely stakeholder councils.	Throughout the project when specific events occur or issues are raised by stakeholders
Community contact cards	These are business card size with all the SINSW contact information. The project team/ contractors are instructed to hand out contact cards to stakeholders and community members enquiring about the project. Cards are offered to school administration offices as appropriate. Directs all enquiries, comments and complaints through to our 1300 number and School Infrastruture NSW email address.	Throughout the life of the project and available 12 months post completion
CRM database	All projects are created in SINSW's Customer Relationship Management system – Darzin - at project inception. Interactions, decisions and feedback from stakeholders are captured, and monthly reports generated. Any enquiries and complaints are to be raised in the CRM and immediately notified to the Senior Project Director, Project Director and Community Engagement Manager.	Throughout the life of the project and updated for 12 months post completion
Display boards	A0 size full colour information boards to use at info sessions or to be permanently displayed in appropriate places (school admin office for example).	As required
Door knocks	Provide timely notification to nearby residents of upcoming construction works, changes to pedestrian movements, temporary bus stops, expected impacts and proposed mitigation. Provide written information of construction activity and contact details.	As required prior to periods of construction impacts
Face-to-face meetings/briefings	Activities include meeting, briefings and "walking the site" to engage directly with key stakeholders, directly impacted residents and business owners and the wider community.	As required/if necessary

Communications Tool	Description of Activity	Frequency
FAQs	Set of internally approved answers provided in response to frequently asked questions. Used as part of relevant stakeholder and community communication tools. These are updated as required, and included on the website if appropriate.	Throughout the life of the project
Information booths	Information booths are held locally and staffed by a project team member to answer any questions, concerns or complaints on the project. Info booths are scheduled from the early stages of project delivery through to project completion. Information booths are to be held both at the school/ neighbouring school, as well for the broad community: ▪ School information booths are held at school locations at times that suit parents and caregivers, with frequency to be aligned with project milestones and as required. ▪ Community information booths are usually held at local shopping centres, community centres and places that are easily accessed by the community. They are held at convenient times, such as out of work hours on weekdays and Saturday's. Collateral to be provided include community contact cards, latest project notification or update, with internal FAQs prepared. All liaison to be summarised and loaded in the CRM. Notice of at least 7 days to be provided.	At project milestones and as required
Information sessions (drop in)	Information sessions are a bigger event than an info booth, held at a key milestone or contentious period. We have more information on the project available on display boards/ screens and an information pack handout – including project scope, planning approvals, any impacts on the school community or residents, project timeline, FAQs. Members from the project and communications team will be available to answer questions about the project. These events occur after school hours on a week day (from 3pm – 7pm to cover working parents). All liaison summarised and loaded on the CRM.	As required
Information pack	A 4 page A4 colour, fold out flyer that can include: ▪ Project scope ▪ Project update ▪ FAQs ▪ Contact information ▪ Project timeline To be distributed at info sessions or at other bigger events/ milestones in hard copy and also made available electronically.	As required

Communications Tool	Description of Activity	Frequency
Media releases/events	Media releases are distributed upon media milestones. They promote major project milestones and activities and generate broader community awareness.	Media milestones: ▪ Project announcement ▪ Concept design completion ▪ Planning approval lodged ▪ Planning approval granted ▪ Construction contract tendered ▪ Construction contract awarded ▪ SOD turning opportunity ▪ Handover ▪ Official opening
Notifications	A4, single or double sided, printed in colour that can include FAQs if required Notifications are distributed under varying templates with different headings to suit different purposes: ▪ **Works notification** are used to communicate specific information/ impacts about a project to a more targeted section of the community. This template doesn't have an image so it can be more appropriately targeted for matters like hazardous material. ▪ **Project update** is used when communicating milestones and higher level information to the wider community i.e. project announcement, concept design/DA lodgement, construction award, completion. Always includes the project summary, information booths/ sessions if scheduled, progress summary and contact info.	As required according to the construction program. Distibuted via letterbox drop to local residents and via the school community at least 5-7 days prior to construction activities or other milestones throughout the life of the project. Specific timings indicated in table 5 – Section 8.
Photography, time-lapse photography and videography	Captures progress of construction works and chronicles particular construction activities. Images to be used in notifications, newsletters and report, on the website and Social Media channels, at information sessions and in presentations. Once the project is complete, SINSW will organise photography of external and internal spaces to be used for a range of communications purposes.	Project completion (actual photography and video of completed project) Prior to project completion - artist impressions, flythrough, site plans and contruction progress images are used
Presentations	Details project information for presentations to stakeholder and community groups.	As required

Communications Tool	Description of Activity	Frequency
Priority correspondence	Ministerial (and other) correspondence that is subject to strict response timeframes. Includes correspondence to the Premier, Minister, SINSW and other key stakeholders. SINSW is responsible for drafting responses as requested within the required timeframes.	As required
Project Reference Group	SINSW facilitated Project Reference Group sessions providing information on the design solution, construction activities, project timeframes, key issues and communication and engagement strategies.	Meets every month or as required More information on the PRG is detailed in Section 4
Project signage	A0 sized, durable aluminium signage has been installed at Kyeemagh Public School Provides high level information including project scope, project image and SINSW contact information. Fixed to external fencing/ entrances etc. that are visible and is updated if any damage occurs.	Throughout the life of the project and installed for 12 months post completion
Site visits	Demonstrate project works and progress and facilitate a maintained level of interest in the project. Includes media visits to promote the reporting of construction progress.	As required
School Infrastructure NSW email address	Provide stakeholders and the community an email address linking direct to the Community Engagement team. Email address (schoolinfrastructure@det.nsw.edu.au) is published on all communications materials.	Throughout the life of the project
School Infrastructure NSW website	A dedicated project page for Kyeemagh Public School is located on the SINSW website – https://www.schoolinfrastructure.nsw.gov.au/projects/k/kyeemagh-public-school.html	Updated at least monthly and is live for at least 12 months post completion of the project
Welcome pack/ thank you pack	At project completion the following flyers are utilised: ▪ **Welcome pack** – project completion for school community - A 2 to 4 page A4 flyer which is provided to the school community on the first day/week they are returning to school when new facilities are opening, or attending a new school. Includes project overview, map outlining access to the school and key locations, FAQs, contact information. ▪ **Thank you pack** – A 2 to 4 page A4 flyer tailored to the local residents to thank them for their patience and support of the project.	Project completion only

7. Engagement Delivery Timeline

The following engagement delivery timeline maps tailored communications tools and activities by key milestone.

Table 4: Engagement timeline

Project Phase / milestone	Target Audiences	Proposed communication tools / activities / purpose as per Table 3	Timing / implementation
Site establishment and main construction works, including but not limited to: ▪ Works commenced ▪ Demolition ▪ Asbestos removal ▪ Remediation ▪ Works commenced Key impact periods – noise, dust, traffic, vibration	School community Local residents Local Council	▪ Request for feedback on management strategies for high noise works ▪ Notifications – for school community and residents ▪ Door knocks to directly impacted residents ▪ Info booths/ sessions ▪ Website updates ▪ Project updates ▪ Face to face meetings if required ▪ Advertising of any events and any periods of high disruption ▪ SINSW email address and hotline ▪ Media release ▪ Contact cards ▪ FAQs ▪ Project signage **Alternative methods where applicable:** ▪ No doorknock – letterbox drop with 'door knock' letter template ▪ Digital information booth (if required) with information boards and pack online	July 2020 to December 2021 (at key construction events as required, as per our notification process in Table 5)
▪ Term prior to project completion	School community Local residents	▪ Info session ▪ Display boards ▪ Info pack ▪ Notifications as required to indicate remaining construction still to occur ▪ Website updates	2021

Project Phase / milestone	Target Audiences	Proposed communication tools / activities / purpose as per Table 3	Timing / implementation
		Alternative methods where applicable: ▪ Digital information booth (if required) with information boards and pack online	
Handover and welcome to new school	School community Local residents	▪ Site visits ▪ Media release ▪ Welcome pack ▪ Thank you pack ▪ Photography/videography ▪ Website update ▪ SINSW email address and hotline	2022
Opening		▪ Media release ▪ Official opening ceremony	TBC – at school discrection
Post-opening	All	**Planned** • Website remains live • Project signage remains installed ▪ 1300 phone and email still active, and CRM still maintained for complaints and enquiries.	2022-2023 (12 months post construction completion)

8. Protocols

8.1. Media engagement

SINSW manages all media relations activities, and is responsible for:

- Responding to all media enquiries and instigating all proactive media contact.
- Media interviews and delegation to SINSW media spokespeople who are authorised to speak to the media on behalf of the project
- Informing the Minister's Office and SINSW project team members and communications representatives of all media relations activities in advance and providing the opportunity to participate in events where possible.

8.2. Site visits

SINSW in partnership with Schools Operations and Performance organises and hosts guided project site tours and media briefings as required by the Minister's Office. The Project Team will ensure the required visitor site inductions are undertaken and that all required Personal Protective Equipment (PPE) is worn.

For media site visits and events, SINSW creates, or contributes to, the production of an event pack. This will include an event brief, media release, speaking notes and Q&As.

8.3. Social, online and digital media

SINSW initiates and maintains all social and online media channels. These channels can include Facebook, Twitter, LinkedIn and the website. The SINSW Online Content Team upload to the SINSW website.

8.4. Notification process

Notifications (titled works notifications or project updates as per Table 3) are SINSW's prescribed notification requirement and are the primary mechanism to inform the community and key stakeholders about the impact of school construction on the local area. Notifications provide advance warning of activities and planned disruptions, as per the notice periods in Table 5 below, allowing stakeholders and community members to plan for the impacts and make alternative arrangements where required. Notifications are distributed in person via door knocks, via letterbox drop, via the school and electronically via email.

The CE Manager advises the project team of the relevant notification requirements and timeframes to be met. The team obtains the information necessary to meet these timeframes by:

- Having oversight of the project delivery program
- Visiting site as required
- Attending and participating in construction meetings, planning meetings, and Risk and Opportunity workshops.

Table 5: Notifications periods

Works activity	Minimum community notification period
Notification to communities following major incident	Same day
Emergency works/unforeseen events	Same day
Contamination management and notification	Within 48 hours
Upcoming works notification (minimum disruption)	5- 7 days
Invitation/notification of community event (e.g. info booth)	5 – 7 days
Notifications regarding traffic changes, parking impacts, road closures, major detours	10 – 14 days
Pedestrian route changes and other impacts	10 – 14 days

Works activity	Minimum community notification period
Notifications regarding operational changes for the school community (school drop-off points, entry and exit points)	10 - 14 days
Major construction impacts (out of hours/ significant noise/ demolition)	10 – 14 days
Major impacts to school community e.g. relocation to temporary school	6 months

8.5. Enquiries and complaints management

SINSW manages enquiries (*called interactions in our CRM, Darzin*), and complaints in a timely and responsive manner.

Prior to project delivery, a complaint could be related to lack of community consultation, design of the project, lack of project progress, etc.

During project delivery, a complaint is defined as in regards to construction impacts – *such as* – safety, dust, noise, traffic, congestion, loss of parking, contamination, loss of amenity, hours of work, property damage, property access, service disruption, conduct or behaviour of construction workers, other environmental impacts, unplanned or uncommunicated disruption to the school.

If a phone call, email or face- to- face complaint is received during construction, they must be logged in our CRM, actively managed, closed out and resolved by SINSW within 24-48 hours.

As per our planning approval conditions, a complaints register is updated monthly and is publicly available on the project's website page on the SINSW website.

If the complainant is not satisfied with SINSW response, and they approach SINSW for rectification, the process will involve a secondary review of their complaint as per the outlined process.

Complaints will be escalated when:

- An activity generates three complaints within a 24-hour period (separate complainants).
- Any construction site receives three different complaints within a 24-hour period.
- A single complainant reports three or more complaints within a three day period.
- A complainant threatens to escalate their issue to the media or government representative.
- The complaint was avoidable
- The complaint relates to a compliance matter.

Complaints will be first escalated to the Senior Manager, Community and Engagement or Director of Communications for SINSW as the designated complaints handling management representatives for our projects. Further escalation will be made to the Executive Director, Office of the Chief Executive to mediate if required.

If a complaint still cannot be resolved by SINSW to the satisfaction of the complainant, we will advise them to contact the NSW Ombudsman - https://www.ombo.nsw.gov.au/complaints.

The below table summarises timeframes for responding to enquiries and complaints, through each correspondence method:

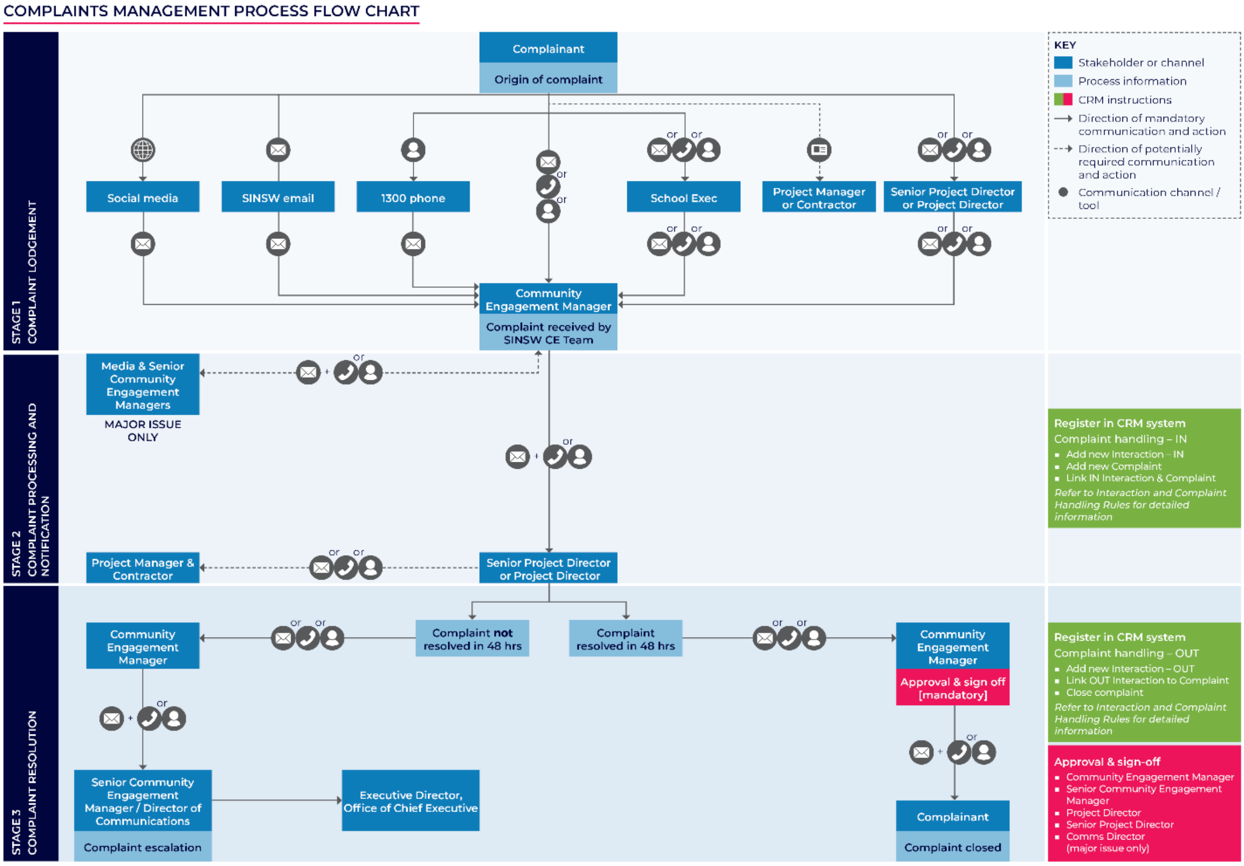
Table 6: Complaint and enquiry response time

Complaint	Acknowledgement times	Response times
Phone call during business hours	At time of call – and agree with caller estimated timeframe for resolution.	Complaint to be closed out within 48 hours. If not possible, continue contact, escalate as required and resolve within 7 business days.
Phone call after hours*	Within two (2) hours of receiving message upon returning to office.	Following acknowledgement, complaint to be closed out within 48 hours. If not possible, continue contact,

Complaint	Acknowledgement times	Response times
		escalate as required and resolve within 7 business days.
Email during business hours	At time of email (automatic response)	Complaint to be closed out within 48 hours. If not possible, continue contact, escalate internally as required and resolve within 7 business days.
Email outside of business hours	At time of email (automatic response)	Complaint to be closed out within 48 hours (once return to business hours). If not possible, continue contact, escalate internally as required and resolve within 7 business days.
Interaction/ Enquiry		
Phone call during business hours	At time of call – and agree with caller estimated timeframe for response.	Interaction to be logged and closed out within 7 business days.
Phone call after hours	Within two (2) hours of receiving message upon returning to office.	Interaction to be logged and closed out within 7 business days.
Email during business hours	At time of email (automatic response)	Interaction to be logged and closed out within 7 business days.
Email outside of business hours	At time of email (automatic response)	Interaction to be logged and closed out within 7 business days.
Letter	N/A	Interaction to be logged and closed out within 10 business days following receipt.

The below diagram outlines our internal process for managing complaints.

Figure 3 - Internal Complaints Process



8.5.1. Disputes involving compensation and rectification

School Infrastructure NSW is committed to working with the school and broader community to address concerns as they arise. Where disputes arise that involve compensation or rectification, the process for resolving community enquiries and complaints will be followed to investigate the dispute. Depending upon the results of the investigation, School Infrastructure NSW may seek legal advice before proceeding.

8.6. Incident management

An incident is an occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance. Material harm is harm that:

(c) involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial; *or*

(d) results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000, (such 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).

8.6.1. Roles and responsibilities following an incident

In the event of an incident, once emergency services are contacted, the incident must be immediately reported to the SINSW Senior Project Director who will inform:

- SINSW Executive Director
- SINSW C&E Manager
- SINSW Senior Manager, C&E
- SINSW Communications Director

SINSW Communications Director will:

- Lead and manage all communications with the Minister’s office in the event of an incident, with assistance as required

- Direct all communications with media to the SINSW Media Manager in the first instance for management
- Notify all other key project stakeholders of an incident.

The school and local community will be notified within 24 hours in the event of an incident, as per our notification timelines in Table 5.

The SINSW Senior Project Director will issue a written incident notification to Department of Planning, Industry & Environment (DPIE) (compliance@planning.nsw.gov.au) and Local Council immediately following the incident to set out the location and nature of the incident.

This must be followed within seven days following the incident of a written notification to the Department of Planning, Industry and Environment (compliance@planning.nsw.gov.au) that:

(e) identifies the development and application number;

(f) provides details of the incident (date, time, location, a brief description of what occurred and why it is classified as an incident);

(g) identifies how the incident was detected;

(h) identifies when SINSW became aware of the incident;

(i) identify any actual or potential non-compliance with conditions of consent;

(j) describes what immediate steps were taken in relation to the incident;

(k) identifies further action(s) that will be taken in relation to the incident; and

(l) provides the contact information for further communication regarding the incident (the Senior Project Director).

Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Planning Secretary, SINSW will provide the Planning Secretary and any relevant public authorities (as determined by the Planning Secretary) with a detailed report on the incident addressing all requirements below:

(m) a summary of the incident;

(n) outcomes of an incident investigation, including identification of the cause of the incident;

(o) details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence; and

(p) details of any communication with other stakeholders regarding the incident.

8.7. Reporting process

Throughout the project, data will be recorded on participation levels both face to face and online, a record of engagement tools and activities carried out in addition to queries received and feedback against emerging themes.

Stakeholder and community sentiment will be evaluated throughout to ensure effectiveness of the engagement strategy and to inform future activities.

Reporting will include but not be limited to:

- Stakeholder engagement reporting – numbers of forums, participation levels and a summary of the outcomes Community sentiment reporting – outputs of all community engagement activities, including numbers in attendance at events, participation levels and feedback received against broad themes
- Online activity – through the project website and via social media
- Media monitoring – as part of the proactive media campaign
- Engagement risk register - to be updated regularly.

Appendix A – Changing the way we communicate – community engagement alternative methods

Below are proposed alternatives to our standard mandatory requirements for community engagement effective as of 30 March 2020. These alternatives are proposed to ensure we continue to comply with SSD and DA conditions and that our communities can remain informed about our projects while adhering to social distancing requirements and NSW Health advice.

Our engagement principles for this period should continue to ensure our communications are:

- Simple
- Streamlined
- Accessible.

Summary of mandatory requirements and alternatives:

Items in **bold** have alternate delivery options.

SSD CONDITION	ALTERNATIVE
1300 community information line	No change
Advertising (print)	Promote online info session / generic single advert
Call centre scripts	No change
Community contact cards	Contractors to hand out as required
CRM database	No change
Display boards	Digital version
Door knocks	No door knocks, use letterbox drop*
Face-to-face meetings/briefings	Phone call or teleconferencing
FAQs	No change
Information booths	No info booths: issue project update instead Digital version
Information sessions (drop in)	Digital version
Information pack	Digital version
Media releases/events	No change to media releases, no events to be held
Notifications	Distributed to school community via email from Principal Distributed to near neighbours via letterbox drop*

SSD CONDITION	ALTERNATIVE
Photography, time-lapse photography and videography	Source photography if health advice permits Use images and time-lapse from similar projects if unable to photograph site
Presentations	Digital version for PRGs/stakeholder meetings
Priority correspondence (RML)	No change
Project Reference Group	Skype meetings / teleconferencing
Project signage	No change if production and installation still possible; A4 print out delivered
Site visits	Site visits via phone/video/photography
School Infrastructure NSW email	No change
School Infrastructure NSW website	No change (may publish updates more frequently)
Welcome pack/ thank you pack	Welcome pack: Do not issue until school resumes Thank you pack: Issued when project is entirely complete

*alternative may change depending on distributor operations

APPENDIX 10: CONSTRUCTION WASTE MANAGEMENT SUB PLAN

CONSTRUCTION WASTE MANAGEMENT SUB PLAN (CWMSP)

CEMP APPENDIX 10 SUB PLAN

Kyeemagh Public School

Jacobson Avenue & Beehag Street,
Kyeemagh NSW 2216

■■■

E-PLAN-01 (Rev. September 2020) | Approved by Andrew Andreou
Uncontrolled copy once printed

taylorau.com.au

Contents

1. INTRODUCTION

1.1 PROJECT INFORMATION TABLE

PROJECT INFORMATION TABLE		
PROJECT NAME	Kyeemagh Public School	
LOCATION	Jacobson & Beehag Streets, Kyeemagh NSW 2216	
CLIENT	NSW Department of Education	
DURATION OF CONTRACT	80 Weeks	
TAYLOR CONTACT INFORMATION		
COMPANY NAME	Taylor Construction Group Pty Ltd	
ABN	25 067 428 344	
ADDRESS	Level 13, 157 Walker Street, North Sydney 2060	
TELEPHONE & FAX	Ph.: 02 8736 9000 Fax: 02 8736 9090	
POSITION	CONTACT NAME	PHONE NUMBERS
CHIEF OPERATING OFFICER	Clive Wickham	02 8736 9000
GENERAL MANAGER	Tim Christie	02 8736 9000
CONSTRUCTION MANAGER	Doug Wood	0414 939 854
SR PROJECT MANAGER	Steve Ziaziaris	0413 182 641
SITE MANAGER	David Pereira	0415 241 170
HSE MANAGER	Andrew Andreou	0404 492 614
SAFETY ADVISOR	TBC	TBC
QUALITY MANAGER	Stephen Player	02 8736 9000
CONTRACT ADMINISTRATOR	Scott Dobson	0414 984 567
SITE ENGINEER	Shanil Prasad	0432 870 855
CADET	Daniel Taylor	0458 476 555
CADET	Kurt Dessmann	0431 205 832
DOCUMENT CONTROL	NAME & POSITION	SIGNATURE & DATE
PREPARED BY:	Shanil Prasad – Site Engineer	17.09.2020
REVIEWED BY:	Steve Ziaziaris – Senior Project Manager	17.09.2020
REVIEWED BY:		

REVISED BY	REV. No.	DATE	CHANGES MADE
Shanil Prasad	Draft	17.07.20	Initial draft
Shanil Prasad	1	29.07.20	Revised as per comments.
Shanil Prasad	2	30.07.20	Revised as per additional comments.
Shanil Prasad	3	31.07.20	Updated condition table
Shanil Prasad	4	17.09.20	Revised as per Wolfpeak comments

1.2 PURPOSE OF THE CONSTRUCTION WASTE MANAGEMENT SUB PLAN

Taylor Construction Group Pty Ltd has a documented Quality, Health, Safety and Environmental (QSE) Management System. The management systems are integrated, and this management plan forms part of the Construction Environmental Management Plan (CEMP) and should be read in conjunction with the CEMP.

One of the Environmental Factors Objectives identified in the CEMP is to:

Ensure that wastes are contained and isolated from land, ground and surface water surrounds and treatment or collection does not result in long-term impacts on the natural environment.

With a requirement to:

Identify sources of solid and liquid waste and estimate the proposed amount generated. Propose measures to manage and/ or mitigate impacts.

Further to this, the CEMP details the following Objective and Target relating to Waste Management:

Objectives	Targets
Increase amount of waste being recycled, reduce waste cost.	Eighty-five per cent (85%) of waste to be recycled.

This plan will provide further details regarding satisfying these items for this project.

1.3 DEVELOPMENT CONDITIONS CONSENT

Condition	Description	Page Number
B16 (a)	The Construction Waste Management Sub-Plan (CWMSP) must address, but not be limited to, the following: (a) detail the quantities of each waste type generated during construction and the proposed reuse, recycling and disposal locations; and	Section 2.3 Page 7
B16 (b)	The Construction Waste Management Sub-Plan (CWMSP) must address, but not be limited to, the following: (b) removal of hazardous materials, particularly the method of containment and control of emission of fibres to the air, and disposal at an approved waste disposal facility in accordance with the requirements of the relevant legislation, codes, standards and guidelines, prior to the commencement of construction.	Section 3 Appendix 1 p9 and p11

2. GENERAL WASTE MANAGEMENT PLAN

2.1 INTRODUCTION

TCG and Subcontractors shall adopt the hierarchy of waste – avoid, reduce, recycle/reprocess and dispose to maximise resource recovery and minimise disposal wherever possible and practical. TCG is responsible for creating and managing the waste management education process, including correct separation of garbage and recycling items. The importance of appropriate waste management practices is to be included in the site induction.

The site will be provided with suitable bins and skips for appropriate collection and separation of waste and recyclables, and these are to be collected with appropriately qualified and licensed waste contractors.

When selecting and using waste recycling and disposal centres, the following factors will be considered:

- Quantity and type of material (including its re-use and recyclability)
- Cost to dispose material
- Geographical location of waste centre
- Legal issues such as if the waste centre is able to lawfully accept the waste material

Recycling and disposal of bulk waste materials will be by excavators, forklifts & cranes to load trucks and transport to the appropriate waste or recycling facility. Excavated materials would be removed off site each day, except where removal is impeded on that day. Stockpiling of materials would involve the provision of a bund and plastic covering over the stockpile, which is secured against wind.

Prior to disposal, wastes must be classified in accordance with the DECCW's Waste Classification Guidelines (April 2008) prior to transporting waste off site. Waste receipts must be kept for legal requirements and details of waste separated and disposed of is to be documented in the Waste and Recycling Register.

TCG will ensure that all waste service providers submit monthly reports on all equipment movements and weights of any waste and recycling products removed from the development.

References:

- SE-F-23 KPI Monthly Report Form
- E-F-03 Waste and Recycling Register

2.2 COMPANY WASTER PROFILE

TCG receives monthly waste statistics reports from its waste management contractor and is able to forecast waste generation estimates for other similar projects from this historical data. The table below summarises waste statistics from five current school works projects being undertaken by TCG in Sydney, having a project value between $5-30m.

Project	Pendle Hill High School	Willoughby Girls High School	Greenwich Public School	Knox Grammar	Yagoona Public School	All Project Average
Status	Completed	Completed	Completed	Complete	Completed	
Waste Record Period (Mths)	12	11	12	7	6	
Total Waste Collected (T)	302.49	281.84	294.6	495.62	21.26	**279.16**
Total Waste Recycled (T)	298.54	278.12	291.84	486.59	20.54	**275.13**
Total Waste Recycled (%)	98.70%	98.68%	99.07%	98.18%	96.65%	**98.25%**

Project	Pendle Hill High School	Willoughby Girls High School	Greenwich Public School	Knox Grammar	Yagoona Public School	All Project Average
Total Waste Landfill (T)	3.94	3.71	2.75	9.0261	0.7162	**4.03**
Total Waste Landfill (%)	1.30%	1.32%	0.93%	1.82%	3.37%	**1.75%**

Project	Pendle Hill High School	Willoughby Girls High School	Greenwich Public School	Knox Grammar	Yagoona Public School	All Project Average
Vegetation waste	9.14%	6.78%	5.5%	0.11%	13.33%	**6.97%**
Concrete, Brick, Tiles	30.99%	36.91%	41.41%	20.87%	23.33%	**30.70%**
Fill/VENM	9.76%	0.92%	3.76%	0.00%	0.00%	**2.89%**
Asphalt	2.17%	1.37%	1.69%	0.00%	0.00%	**1.05%**
Timber	18.03%	19.13%	19.40%	37.22%	20.00%	**22.76%**
Glass	0.00%	0.00%	0.00%	0.00%	0.00%	**0.00%**
Paper & Cupboard	5.95%	10.79%	1.70%	15.32%	23.33%	**13.22%**
Plastic	3.7%	2.39%	2.49%	0.00%	0.00%	**1.72%**
Plasterboard	11.03%	6.36%	4.28%	15.23%	0.00%	**7.38%**
Steel / Iron	6.51%	11.24%	8.93%	7.82%	13.33%	**9.57%**
Non -Ferrous Metal	0.73%	0.00%	0.00%	0.00%	0.00%	**0.15%**
Food – Organics	0.07%	0.15%	0.18%	0.00%	0.00%	**0.08%**
Other	0.29%	0.33%	0.27%	0.00%	0.00%	**.0.18%**
Other-Mixed	1.63%	3.63%	1.38%	3.44%	6.67%	**3.35%**

This data indicates that the Kyeemagh Public School project could generate a greater than 85% recyclable waste by volume of total construction waste generated, and less than 15% landfill waste. This estimated amount of recyclable waste is above TCG's corporate target of 85%.

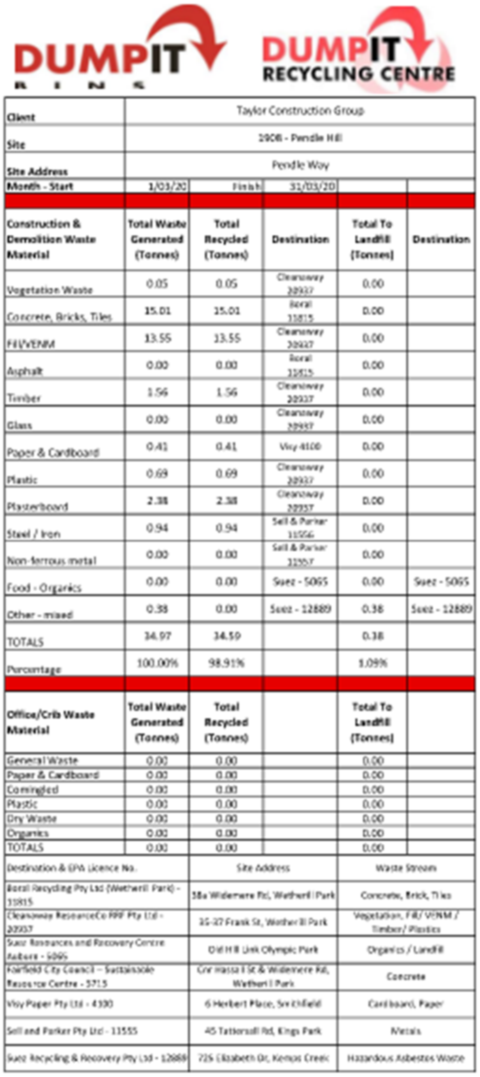
2.3 ESTIMATED PROJECT WASTE SCHEDULE

The following schedule provides a breakdown of the expected waste for the project based on a comparable project with actual waste records.

Project	Comparable Project Pendle Hill High School (%)	Comparable Project Pendle Hill High School (T)	Recycle or Disposal Destination & EPA Licence	Recycle or Disposal Address
Total Waste Recycled (%)	98.70%	298.55		
Total Waste Landfill (%)	1.30%	3.94		
Vegetation Waste	9.14%	27.64	Cleanaway 20937	35-37 Frank St, Wetherill Park
Concrete, Brick, Tiles	30.99%	93.75	Boral 11815	38a Wildermere Rd, Wetherill Park
Fill/VENM	9.76%	29.51	Cleanaway 20937	35-37 Frank St, Wetherill Park
Asphalt	2.17%	6.58	Boral 11815	38a Wildermere Rd, Wetherill Park
Timber	18.03%	54.55	Cleanaway 20937	35-37 Frank St, Wetherill Park
Glass	0.00%	0	Dump It Centre	13 Long Street, Smithfield NSW 2164
Paper & Cupboard	5.95%	18	Grima 20648	88 Redfern St, Wetherill Park
Plastic	3.70%	11.19	Grima 20648	88 Redfern St, Wetherill Park
Plasterboard	11.03%	33.35	Grima 20648	88 Redfern St, Wetherill Park
Steel / Iron	6.51%	19.69	Sell & Parker 11556	45 Tattersall Rd, Kings Park
Non-Ferrous Metal	0.73%	2.20	Sell & Parker 11556	45 Tattersall Rd, Kings Park
Food - Organics	0.07%	0.21	Dump It Centre	13 Long Street, Smithfield NSW 2164
Other	0.29%	0.87	Dump It Centre	13 Long Street, Smithfield NSW 2164
Other - Mixed	1.63%	4.94	Dump It Centre	13 Long Street, Smithfield NSW 2164

2.4 WASTE & RECYCLING REGISTER

This below register was used to collate the information above. Taylor have ceased using dump it. Bing industries are now the preferred supplier for bins.



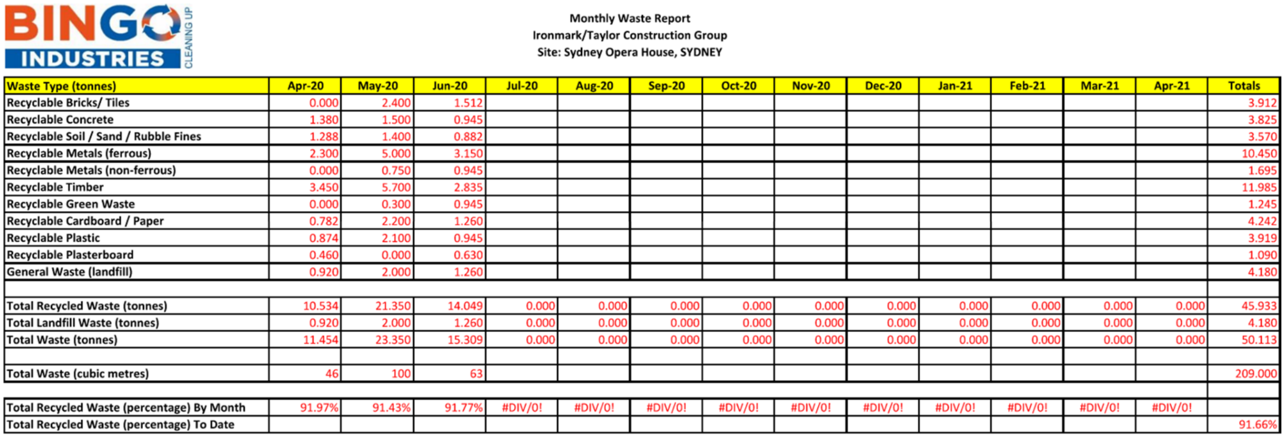
DUMPIT BINS

DUMPIT RECYCLING CENTRE

Client	Taylor Construction Group				
Site	1906 - Pendle Hill				
Site Address	Pendle Way				
Month - Start	1/03/20	Finish	31/03/20		
Construction & Demolition Waste Material	**Total Waste Generated (Tonnes)**	**Total Recycled (Tonnes)**	**Destination**	**Total To Landfill (Tonnes)**	**Destination**
Vegetation Waste	0.05	0.05	Cleanaway 20937	0.00	
Concrete, Bricks, Tiles	15.01	15.01	Boral 11815	0.00	
Fill/VENM	13.55	13.55	Cleanaway 20937	0.00	
Asphalt	0.00	0.00	Boral 11815	0.00	
Timber	1.56	1.56	Cleanaway 20937	0.00	
Glass	0.00	0.00	Cleanaway 20937	0.00	
Paper & Cardboard	0.41	0.41	Visy 4100	0.00	
Plastic	0.69	0.69	Cleanaway 20937	0.00	
Plasterboard	2.38	2.38	Cleanaway 20937	0.00	
Steel / Iron	0.94	0.94	Sell & Parker 11556	0.00	
Non-ferrous metal	0.00	0.00	Sell & Parker 11557	0.00	
Food - Organics	0.00	0.00	Suez - 5065	0.00	Suez - 5065
Other - mixed	0.38	0.00	Suez - 12889	0.38	Suez - 12889
TOTALS	34.97	34.59		0.38	
Percentage	100.00%	98.91%		1.09%	
Office/Crib Waste Material	**Total Waste Generated (Tonnes)**	**Total Recycled (Tonnes)**		**Total To Landfill (Tonnes)**	
General Waste	0.00	0.00		0.00	
Paper & Cardboard	0.00	0.00		0.00	
Comingled	0.00	0.00		0.00	
Plastic	0.00	0.00		0.00	
Dry Waste	0.00	0.00		0.00	
Organics	0.00	0.00		0.00	
TOTALS	0.00	0.00		0.00	

Destination & EPA Licence No.	Site Address	Waste Stream
Boral Recycling Pty Ltd (Wetherill Park) - 11815	38a Widemere Rd, Wetherill Park	Concrete, Brick, Tiles
Cleanaway ResourceCo RRF Pty Ltd - 20937	35-37 Frank St, Wetherill Park	Vegetation, Fill/ VENM / Timber/ Plastics
Suez Resources and Recovery Centre Auburn - 5065	Old Hill Link Olympic Park	Organics / Landfill
Fairfield City Council – Sustainable Resource Centre - 5715	Cnr Hassall St & Widemere Rd, Wetherill Park	Concrete
Visy Paper Pty Ltd - 4300	6 Herbert Place, Smithfield	Cardboard, Paper
Sell and Parker Pty Ltd - 11555	45 Tattersall Rd, Kings Park	Metals
Suez Recycling & Recovery Pty Ltd - 12889	725 Elizabeth Dr, Kemps Creek	Hazardous Asbestos Waste

The below register will be utilised through the project in order to track the waste produced on the project and provide a progressive benchmark score in order to track against overall goal of 85% recycled waste.



BINGO INDUSTRIES CLEANING UP

Monthly Waste Report
Ironmark/Taylor Construction Group
Site: Sydney Opera House, SYDNEY

Waste Type (tonnes)	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	Totals
Recyclable Bricks/ Tiles	0.000	2.400	1.512											3.912
Recyclable Concrete	1.380	1.500	0.945											3.825
Recyclable Soil / Sand / Rubble Fines	1.288	1.400	0.882											3.570
Recyclable Metals (ferrous)	2.300	5.000	3.150											10.450
Recyclable Metals (non-ferrous)	0.000	0.750	0.945											1.695
Recyclable Timber	3.450	5.700	2.835											11.985
Recyclable Green Waste	0.000	0.300	0.945											1.245
Recyclable Cardboard / Paper	0.782	2.200	1.260											4.242
Recyclable Plastic	0.874	2.100	0.945											3.919
Recyclable Plasterboard	0.460	0.000	0.630											1.090
General Waste (landfill)	0.920	2.000	1.260											4.180
Total Recycled Waste (tonnes)	10.534	21.350	14.049	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	45.933
Total Landfill Waste (tonnes)	0.920	2.000	1.260	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.180
Total Waste (tonnes)	11.454	23.350	15.309	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	50.113
Total Waste (cubic metres)	46	100	63											209.000
Total Recycled Waste (percentage) By Month	91.97%	91.43%	91.77%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Total Recycled Waste (percentage) To Date														91.66%

3. CONTAMINATION WASTE MANAGEMENT PLAN

3.1 CONTAMINATION WASTER MANAGEMENT PLAN

The project has a Remediation Action Plan (RAP) and Asbestos Management Plan (AMP) completed for the Earthworks required for the project. A Validation Plan and Environmental Management Plan are intended to be completed when required and all form part of the Construction Environmental Management Plan for the Project.

3.2 ASBESTOS REMOVAL AND UNEXPECTED FINDINGS

All Asbestos removal will fall under the Project RAP & AMP. Any procedures, requirements and reporting will be stipulated within these documents or the Validation Report completed for the remediation works. Below is an extract from the AMP regarding procedures around unexpected finding of asbestos containing material out of asbestos removal working area:

In the event that asbestos containing material is identified outside of the asbestos removal work area, the following procedure is to be followed:

1. Upon discovery of a fragment(s) of asbestos cement or other asbestos containing material (or suspected asbestos containing material) all work in the immediate area is to cease.

2. The worker discovering the material is to inform his supervisor who in turn will advise the LAA.

3. The LAA will arrange for the area to be secured to prevent disturbance of the material. Where necessary, temporary fencing and warning signs are to be placed around the area.

4. The LAA will arrange, if necessary, for a sample of the material to be analysed to confirm the presence / absence of asbestos fibres.

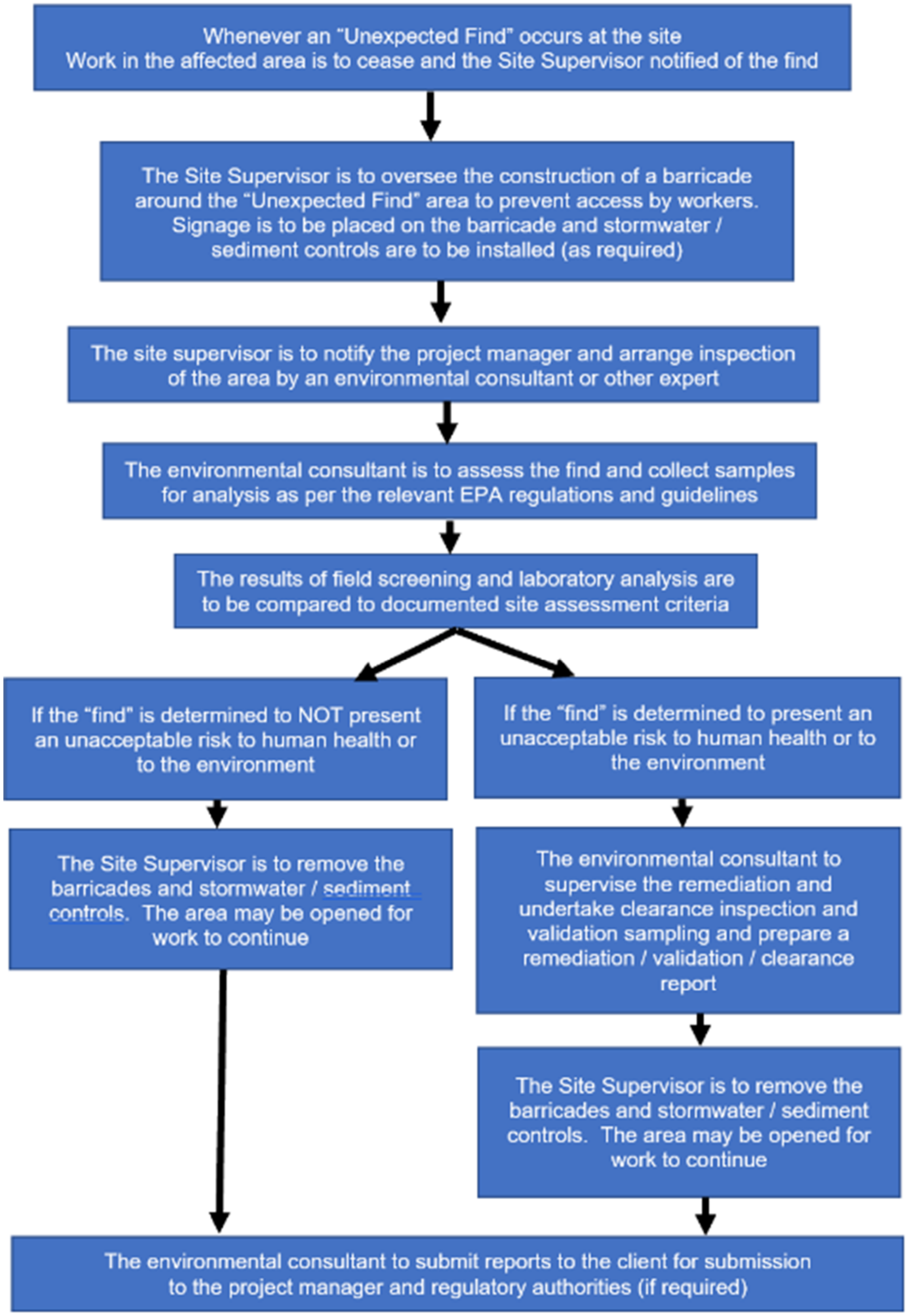
5. Where the material is confirmed as containing asbestos, the asbestos removal contractor is to remove the material for disposal asbestos contaminated waste.

6. Where the material consists of a small number of fragments of asbestos cement sheet, asbestos PPE including disposable gloves is to be worn during the collection of the material. The fragment(s) will be picked up and the glove turned inside out to 'bag' the fragment(s). The disposable glove containing the fragment(s) of asbestos cement sheet will then be placed directly into an asbestos waste bag for disposal.

7. The area is to be visually inspected by the LAA to verify that all of the asbestos containing material has been removed. A clearance report is to be compiled following the inspection.

8. Where a larger quantity of asbestos containing material is identified, the soil containing the asbestos containing material is to be excavated in accordance with the procedure detailed in Section 5 above. A visual inspection and validation sampling is to be undertaken and the details of this work are to be recorded in the validation report.

The above procedure is summarised in the following flowchart:



Whenever an "Unexpected Find" occurs at the site
Work in the affected area is to cease and the Site Supervisor notified of the find

The Site Supervisor is to oversee the construction of a barricade around the "Unexpected Find" area to prevent access by workers. Signage is to be placed on the barricade and stormwater / sediment controls are to be installed (as required)

The site supervisor is to notify the project manager and arrange inspection of the area by an environmental consultant or other expert

The environmental consultant is to assess the find and collect samples for analysis as per the relevant EPA regulations and guidelines

The results of field screening and laboratory analysis are to be compared to documented site assessment criteria

If the "find" is determined to NOT present an unacceptable risk to human health or to the environment

The Site Supervisor is to remove the barricades and stormwater / sediment controls. The area may be opened for work to continue

If the "find" is determined to present an unacceptable risk to human health or to the environment

The environmental consultant to supervise the remediation and undertake clearance inspection and validation sampling and prepare a remediation / validation / clearance report

The Site Supervisor is to remove the barricades and stormwater / sediment controls. The area may be opened for work to continue

The environmental consultant to submit reports to the client for submission to the project manager and regulatory authorities (if required)

3.3 AIRBORNE ASBESTOS FIRBRE MONITORING

Below is an extract from the AMP regarding airborne asbestos fibre monitoring.

Monitoring for airborne asbestos fibres should be carried out at all times throughout the duration of the asbestos contaminated soil removal work by a licenced asbestos assessor (LAA) engaged by PF Civil.

Monitoring is to be carried out in accordance with the requirements of the National Occupational Health and Safety Commission (NOHSC) Code of Practice for the Safe Removal of Asbestos, particularly the 'Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres' 2nd edition [NOHSC:3003(2005)]. Analysis of the air monitoring filters is to be carried out by a NATA accredited laboratory.

Air monitors are to be placed in the decontamination / change area and on the temporary fencing or barricade surrounding the asbestos removal work area. Up to four monitors are to be placed on the perimeter of the asbestos removal work area.

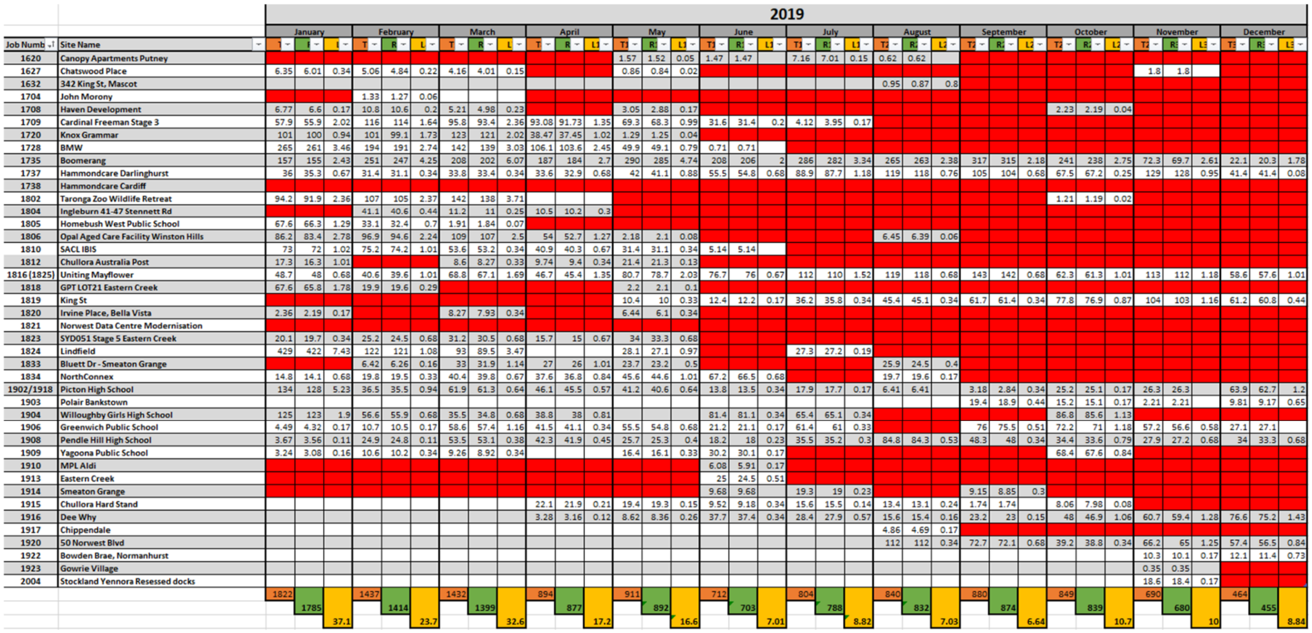
The daily reports of the results of the air monitoring will be forwarded to PF Civil.

The NOHSC recommended maximum exposure level for airborne asbestos fibres, measured as a time weighted average over an 8 hour work shift, is 0.1 fibres per millilitre of air (0.1 fibres/ml).

The NOHSC Code of Practice for the Safe Removal of Asbestos details control levels for airborne asbestos fibre concentrations that are to be observed during the work. These control levels are as follows:

Airborne fibre concentration (fibres/ml)	*Control Measure*
<0.01	*Continue work using existing asbestos dust control measures*
>0.01	*Continue work and review asbestos dust control measures*
>0.02	*Stop work, identify cause of dust emissions and revise dust control measures.*

(Refer to appendix 2)



		2019																																			
		January			February			March			April			May			June			July			August			September			October			November			December		
Job Numb	Site Name	T	R	L	T	R	L	T	R	L	T	R	L1	T1	R1	L1	T1	R1	L1	T1	R1	L1	T2	R2	L2	T2	R2	L2	T2	R2	L2	T2	R3	L3	T3	R3	L3
1620	Canopy Apartments Putney	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	1.57	1.52	0.05	1.47	1.47		7.16	7.01	0.15	0.62	0.62		🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1627	Chatswood Place	6.35	6.01	0.34	5.06	4.84	0.22	4.16	4.01	0.15	🟥	🟥	🟥	0.86	0.84	0.02	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	1.8	1.8		🟥	🟥	🟥
1632	342 King St, Mascot																						0.95	0.87	0.8	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1704	John Morony	🟥	🟥	🟥	1.33	1.27	0.06				🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1708	Haven Development	6.77	6.6	0.17	10.8	10.6	0.2	5.21	4.98	0.23	🟥	🟥	🟥	3.05	2.88	0.17	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	2.23	2.19	0.04	🟥	🟥	🟥	🟥	🟥	🟥
1709	Cardinal Freeman Stage 3	57.9	55.9	2.02	116	114	1.64	95.8	93.4	2.36	93.08	91.73	1.35	69.3	68.3	0.99	31.6	31.4	0.2	4.12	3.95	0.17	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1720	Knox Grammar	101	100	0.94	101	99.1	1.73	123	121	2.02	38.47	37.45	1.02	1.29	1.25	0.04	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1728	BMW	265	261	3.46	194	191	2.74	142	139	3.03	106.1	103.6	2.45	49.9	49.1	0.79	0.71	0.71		🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1735	Boomerang	157	155	2.43	251	247	4.25	208	202	6.07	187	184	2.7	290	285	4.74	208	206	2	286	282	3.34	265	263	2.38	317	315	2.18	241	238	2.75	72.3	69.7	2.61	22.1	20.3	1.78
1737	Hammondcare Darlinghurst	36	35.3	0.67	31.4	31.1	0.34	33.8	33.4	0.34	33.6	32.9	0.68	42	41.1	0.88	55.5	54.8	0.68	88.9	87.7	1.18	119	118	0.76	105	104	0.68	67.5	67.2	0.25	129	128	0.95	41.4	41.4	0.08
1738	Hammondcare Cardiff	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1802	Taronga Zoo Wildlife Retreat	94.2	91.9	2.36	107	105	2.37	142	138	3.71				🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	1.21	1.19	0.02	🟥	🟥	🟥	🟥	🟥	🟥
1804	Ingleburn 41-47 Stennett Rd	🟥	🟥	🟥	41.1	40.6	0.44	11.2	11	0.25	10.5	10.2	0.3	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1805	Homebush West Public School	67.6	66.3	1.29	33.1	32.4	0.7	1.91	1.84	0.07	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1806	Opal Aged Care Facility Winston Hills	86.2	83.4	2.78	96.9	94.6	2.24	109	107	2.5	54	52.7	1.27	2.18	2.1	0.08	🟥	🟥	🟥	🟥	🟥	🟥	6.45	6.39	0.06	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1810	SACL IBIS	73	72	1.02	75.2	74.2	1.01	53.6	53.2	0.34	40.9	40.3	0.67	31.4	31.1	0.34	5.14	5.14		🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1812	Chullora Australia Post	17.3	16.3	1.01	🟥	🟥	🟥	8.6	8.27	0.33	9.74	9.4	0.34	21.4	21.3	0.13	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1816 (1825)	Uniting Mayflower	48.7	48	0.68	40.6	39.6	1.01	68.8	67.1	1.69	46.7	45.4	1.35	80.7	78.7	2.03	76.7	76	0.67	112	110	1.52	119	118	0.68	143	142	0.68	62.3	61.3	1.01	113	112	1.18	58.6	57.6	1.01
1818	GPT LOT21 Eastern Creek	67.6	65.8	1.78	19.9	19.6	0.29	🟥	🟥	🟥	🟥	🟥	🟥	2.2	2.1	0.1	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1819	King St	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	10.4	10	0.33	12.4	12.2	0.17	36.2	35.8	0.34	45.4	45.1	0.34	61.7	61.4	0.34	77.8	76.9	0.87	104	103	1.16	61.2	60.8	0.44
1820	Irvine Place, Bella Vista	2.36	2.19	0.17	🟥	🟥	🟥	8.27	7.93	0.34	🟥	🟥	🟥	6.44	6.1	0.34	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1821	Norwest Data Centre Modernisation	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1823	SYD051 Stage 5 Eastern Creek	20.1	19.7	0.34	25.2	24.5	0.68	31.2	30.5	0.68	15.7	15	0.67	34	33.3	0.68	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1824	Lindfield	429	422	7.43	122	121	1.08	93	89.5	3.47				28.1	27.1	0.97	🟥	🟥	🟥	27.3	27.2	0.19	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1833	Bluett Dr - Smeaton Grange	🟥	🟥	🟥	6.42	6.26	0.16	33	31.9	1.14	27	26	1.01	23.7	23.2	0.5	🟥	🟥	🟥	🟥	🟥	🟥	25.9	24.5	0.4	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1834	NorthConnex	14.8	14.1	0.68	19.8	19.5	0.33	40.4	39.8	0.67	37.6	36.8	0.84	45.6	44.6	1.01	67.2	66.5	0.68	🟥	🟥	🟥	19.7	19.6	0.17	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1902/1918	Picton High School	134	128	5.23	36.5	35.5	0.94	61.9	61.3	0.64	46.1	45.5	0.57	41.2	40.6	0.64	13.8	13.5	0.34	17.9	17.7	0.17	6.41	6.41		3.18	2.84	0.34	25.2	25.1	0.17	26.3	26.3		63.9	62.7	1.2
1903	Polair Bankstown																									19.4	18.9	0.44	15.2	15.1	0.17	2.21	2.21		9.81	9.17	0.65
1904	Willoughby Girls High School	125	123	1.9	56.6	55.9	0.68	35.5	34.8	0.68	38.8	38	0.81				81.4	81.1	0.34	65.4	65.1	0.34	🟥	🟥	🟥	🟥	🟥	🟥	86.8	85.6	1.13	🟥	🟥	🟥	🟥	🟥	🟥
1906	Greenwich Public School	4.49	4.32	0.17	10.7	10.5	0.17	58.6	57.4	1.16	41.5	41.1	0.34	55.5	54.8	0.68	21.2	21.1	0.17	61.4	61	0.33	🟥	🟥	🟥	76	75.5	0.51	72.2	71	1.18	57.2	56.6	0.58	27.1	27.1	
1908	Pendle Hill High School	3.67	3.56	0.11	24.9	24.8	0.11	53.5	53.1	0.38	42.3	41.9	0.45	25.7	25.3	0.4	18.2	18	0.23	35.5	35.2	0.3	84.8	84.3	0.53	48.3	48	0.34	34.4	33.6	0.79	27.9	27.2	0.68	34	33.3	0.68
1909	Yagoona Public School	3.24	3.08	0.16	10.6	10.2	0.34	9.26	8.92	0.34				16.4	16.1	0.33	30.2	30.1	0.17	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	68.4	67.6	0.84	🟥	🟥	🟥	🟥	🟥	🟥
1910	MPL Aldi	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	6.08	5.91	0.17	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1913	Eastern Creek	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	25	24.5	0.51	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1914	Smeaton Grange	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	9.68	9.68		19.3	19	0.23	🟥	🟥	🟥	9.15	8.85	0.3	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1915	Chullora Hard Stand										22.1	21.9	0.21	19.4	19.3	0.15	9.52	9.18	0.34	15.6	15.5	0.14	13.4	13.1	0.24	1.74	1.74		8.06	7.98	0.08	🟥	🟥	🟥	🟥	🟥	🟥
1916	Dee Why										3.28	3.16	0.12	8.62	8.36	0.26	37.7	37.4	0.34	28.4	27.9	0.57	15.6	15.4	0.16	23.2	23	0.15	48	46.9	1.06	60.7	59.4	1.28	76.6	75.2	1.43
1917	Chippendale																						4.86	4.69	0.17	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1920	50 Norwest Blvd																						112	112	0.34	72.7	72.1	0.68	39.2	38.8	0.34	66.2	65	1.25	57.4	56.5	0.84
1922	Bowden Brae, Normanhurst																															10.3	10.1	0.17	12.1	11.4	0.73
1923	Gowrie Village																															0.35	0.35		🟥	🟥	🟥
2004	Stockland Yennora Resessed docks																															18.6	18.4	0.17	🟥	🟥	🟥
		1822			1437			1432			894			911			712			804			840			880			849			690			464		
			1785			1414			1399			877			892			703			788			832			874			839			680			455	
				37.1			23.7			32.6			17.2			16.6			7.01			8.82			7.03			6.64			10.7			10			8.84

4. APPENDIX 1 WASTE MANAGEMENT PLAN:

PO Box 7, Enfield NSW 2136
PO Box 5351, Clayton South VIC 3168
T: 1300 424 646 F: 02 9737 0351
enquiries@bingoindustries.com.au
www.bingoindustries.com.au

CONFIDENTIAL

Waste Management & Recycling Plan (NSW)

Bingo Industries offers a complete, comprehensive solution to the management and recycling of wastes to assure compliance with clients' waste management policy.

Bingo Recycling Centre's combine bin storage, waste collection, waste recycling and waste transfer to service the building and construction industry and domestic waste management needs in New South Wales. Wastes collected by Bingo Bins are taken directly to one of these facilities where approximately 90% of wastes are converted to recovered resources.

Bingo Recycling Centre Alexandria	EPL No. 4679
Bingo Recycling Centre Artarmon	EPL No. 20763
Bingo Recycling Centre Auburn	EPL No. 10935
Bingo Recycling Centre Eastern Creek (Genesis)	EPL No. 20121
Bingo Recycling Centre Greenacre	EPL No. 20847
Bingo Recycling Centre Kembla Grange	EPL No. 20601
Bingo Recycling Centre Mortdale	EPL No. 20622
Bingo Recycling Centre Revesby	EPL No. 20607
Bingo Recycling Centre Tomago	EPL No. 20585

As can be expected waste materials inwards vary considerably and are delivered to the Recycling Centres in tipping and non-tipping vehicles or in skip bins. Of the wastes inwards approximately 90% is recovered and recycled as materials outwards and the balance 10% to landfill. Waste materials inwards are processed to achieve the maximum recovery of resources and the minimum of un-recoverable material for offsite disposal.

Typical Composition of Bingo's Wastes Inwards

Wastes Inwards	**Percentage (approx.)**
Heavy Recyclable Materials	45%
Light Recyclable Materials	35%
Metals	10%
Non-Recyclable Materials	10%
Total	100%

Heavy Recyclable Materials:

- Soil
- Dirt
- Sand
- Rubble
- Brick
- Concrete
- Tiles
- Stone
- Asphalt

Light Recyclable Materials:

- Timber
- Green Waste
- Cardboard/ Paper
- Plastic
- Plasterboard

Metals:

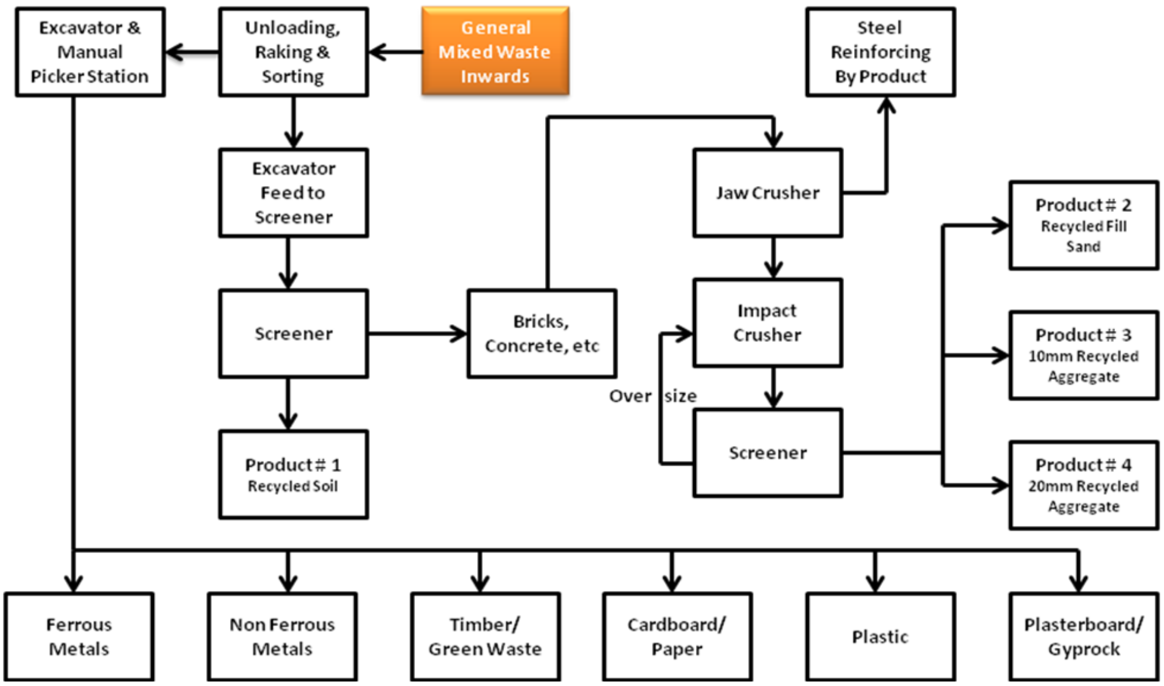
- Ferrous (steel, black iron)
- Non-Ferrous (copper, wire, aluminium, stainless)

At the Resource Recovery Facility a simple and effective waste processing procedure is applied. See Materials Flow Diagram (below). Wastes inwards unloaded onto the sorting area where the waste is raked with a hydraulic excavator to expose the contents and where recyclable materials are hand and machine sorted. The raking process separates the waste into four streams for further processing.

Stream #1	Non-recyclable materials. These wastes pass to a holding area for off-site disposal.
Stream #2	Metals and light recyclable materials are removed and stored for off-site recycling.
Stream #3	Large sized heavy weight brick, concrete and rubble pieces. These wastes pass to the crushers where they are crushed and re-enforcing fabric removed. The output from the crushers passes to the screener where products of different size are separated and stored in stockpiles. Re-enforcing fabric is collected and stored in the general steel bin for off-site recycling.
Stream #4	Small sized heavy weight soil, sand, brick, concrete and rubble. These wastes pass to the screener where the soil is separated form the brick, concrete and rubble. The brick, concrete and rubble then pass through Stream #3.

Stream #1 wastes are currently not recyclable and are removed from the land for off-site disposal. Stream #2 wastes, recovered metals and light recyclable materials are recycled off-site. Stream #3 and Stream #4 wastes are processed on site by crushing and screening to form saleable products such as soil, sand, and aggregates. These products are retained on site until sold.

Bingo Recycling Centre
Waste Transfer & Materials Recovery Facility
Flow Diagram



In summary, Bingo Bins take all their mixed waste skip bins directly to EPA Licensed Recycling Centres. From there the waste is sorted and separated into the following material classes for processing and recycling.

Type of Material	**Where Processed/ Recycled**	**How Processed/ Recycled**
Heavy Recyclable Materials (soil, dirt, sand, rubble, concrete, brick, tiles, asphalt, stone)	Bingo Recycling Centres	Re-processed into recycled products (such as recycled soil, fill sand, aggregates, roadbase) by crushing and screening.
Timber/ Green Waste	Clean & Green Organics/ Genesis	Re-processed into woodchip and mulch by shredding.
Metal/ Steel	Sell & Parker/ CMI/ SIMS/ Sydney Copper Scraps	Re-processed into new metal and steel products by shearing, baling and re-smeltering.
Brick/ Concrete	Boral/ Genesis	Re-processed into recycled products (such as fill sand, aggregates, roadbase) by crushing and screening.
Cardboard/ Paper/ Plastic	Polytrade Recycling/ J.J. Richards/ Orora	Re-processed into new cardboard, paper and plastic products by breaking down the material into a form for re-use.
Plasterboard	ReGyp	Re-processed into gypsum products by shredding and screening.
General Waste	SUEZ Landfill/ Horsley Park Landfill/ Genesis Landfill	n/a

- **Bingo Recycling Centres**
  76-82 Burrows Road, Alexandria NSW 2015
  10 Mclachlan Ave, Artarmon NSW 2064
  3-5 Duck Street, Auburn NSW 2144
  Honeycomb Drive, Eastern Creek NSW 2766
  35 Wentworth St, Greenacre NSW 2190
  50 Wyllie Road, Kembla Grange NSW 2526
  20 Hearne Street, Mortdale NSW 2223
  37-51 Violet Street, Revesby NSW 2212
  29 Laverick Avenue, Tomago NSW 2322
- **Clean & Green Organics**
  769 The Northern Rd, Bringelly NSW 2566
- **Sell & Parker**
  45 Tattersall Road, Blacktown NSW 2148
- **CMI**
  38 York Road, Ingleburn NSW 2565
- **SIMS**
  43 Ashford Ave, Milperra NSW 2214
  76 Christie St, St Marys NSW 2760
- **Sydney Copper Scraps**
  130 Adderley St, Auburn NSW 2760
- **Boral**
  6-10 Burrows Road South, St Peters NSW 2044
- **Polytrade Recycling**
  32 South St, Rydalmere NSW 2116
  40 Madeline St, South Strathfield NSW 2136
- **J.J. Richards**
  12 Heald Rd, Ingleburn NSW 1890
  8 Kommer Pl, St Marys NSW 2760
- **Orora**
  1891 Botany Rd, Matraville NSW 2036
- **ReGyp**
  330 Captain Cook Drive, Kurnell NSW 2231
- **SUEZ Landfill**
  Elizabeth Drive, Kemps Creek NSW 2178
- **Horsley Park Landfill**
  Wallgrove Road, Horsley Park NSW 2164
- **Genesis Landfill**
  Honeycomb Drive, Eastern Creek NSW 2766

5. APPENDIX 2 RECYCLING RESULTS:

		2019																																			
		January			February			March			April			May			June			July			August			September			October			November			December		
Job Number	Site Name	T	R	L	T2	R3	L4	T5	R6	L7	T8	R9	L10	T11	R12	L13	T14	R15	L16	T17	R18	L19	T20	R21	L22	T23	R24	L25	T26	R27	L28	T29	R30	L31	T32	R33	L34
1620	Canopy Apartments Putney	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	1.57	1.52	0.05	1.47	1.47		7.16	7.01	0.15	0.62	0.62		🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1627	Chatswood Place	6.35	6.01	0.34	5.06	4.84	0.22	4.16	4.01	0.15	🟥	🟥	🟥	0.86	0.84	0.02	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	1.8	1.8		🟥	🟥	🟥
1632	342 King St, Mascot																						0.95	0.87	0.8	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1704	John Morony	🟥	🟥	🟥	1.33	1.27	0.06				🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1708	Haven Development	6.77	6.6	0.17	10.75	10.55	0.2	5.21	4.98	0.23	🟥	🟥	🟥	3.05	2.88	0.17	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	2.23	2.19	0.04	🟥	🟥	🟥	🟥	🟥	🟥
1709	Cardinal Freeman Stage 3	57.89	55.87	2.02	115.6	113.9	1.64	95.77	93.41	2.36	93.08	91.73	1.35	69.32	68.33	0.99	31.63	31.43	0.2	4.12	3.95	0.17	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1720	Knox Grammar	101.2	100.2	0.94	100.9	99.12	1.73	123.4	121	2.02	38.47	37.45	1.02	1.29	1.25	0.04	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1728	BMW	264.9	261.2	3.46	194	191.3	2.74	142.4	139.4	3.03	106.1	103.6	2.45	49.93	49.14	0.79	0.71	0.71		🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1735	Boomerang	157.4	155	2.43	251.4	247.4	4.25	207.8	201.8	6.07	187.1	184.4	2.7	289.7	284.9	4.74	208.2	206.2	2	285.7	282.4	3.34	265.4	263	2.38	316.8	314.6	2.18	241	238.3	2.75	72.29	69.68	2.61	22.1	20.32	1.78
1737	Hammondcare Darlinghurst	35.98	35.31	0.67	31.39	31.05	0.34	33.75	33.41	0.34	33.6	32.92	0.68	41.95	41.07	0.88	55.46	54.78	0.68	88.89	87.71	1.18	119.1	118.4	0.76	105	104.3	0.68	67.46	67.21	0.25	128.9	127.9	0.95	41.43	41.36	0.08
1738	Hammondcare Cardiff	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1802	Taronga Zoo Wildlife Retreat	94.23	91.87	2.36	107.2	104.8	2.37	141.6	137.9	3.71				🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	1.21	1.19	0.02	🟥	🟥	🟥	🟥	🟥	🟥
1804	Ingleburn 41-47 Stennett Rd	🟥	🟥	🟥	41.08	40.64	0.44	11.2	10.95	0.25	10.46	10.16	0.3	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1805	Homebush West Public School	67.55	66.26	1.29	33.14	32.44	0.7	1.91	1.84	0.07	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1806	Opal Aged Care Facility Winston Hills	86.16	83.38	2.78	96.86	94.62	2.24	109.2	106.7	2.5	53.98	52.71	1.27	2.18	2.1	0.08	🟥	🟥	🟥	🟥	🟥	🟥	6.45	6.39	0.06	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1810	SACL IBIS	72.99	71.97	1.02	75.24	74.23	1.01	53.56	53.22	0.34	40.93	40.26	0.67	31.41	31.07	0.34	5.14	5.14		🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1812	Chullora Australia Post	17.31	16.3	1.01	🟥	🟥	🟥	8.6	8.27	0.33	9.74	9.4	0.34	21.43	21.3	0.13	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1816 (1825)	Uniting Mayflower	48.65	47.97	0.68	40.6	39.59	1.01	68.8	67.11	1.69	46.72	45.37	1.35	80.74	78.71	2.03	76.66	75.99	0.67	111.5	110	1.52	119.1	118.4	0.68	143	142.3	0.68	62.3	61.29	1.01	113.1	111.9	1.18	58.61	57.6	1.01
1818	GPT LOT21 Eastern Creek	67.57	65.79	1.78	19.88	19.59	0.29	🟥	🟥	🟥	🟥	🟥	🟥	2.2	2.1	0.1	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1819	King St	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	10.37	10.04	0.33	12.37	12.2	0.17	36.16	35.82	0.34	45.43	45.09	0.34	61.73	61.39	0.34	77.8	76.93	0.87	104	102.9	1.16	61.2	60.76	0.44
1820	Irvine Place, Bella Vista	2.36	2.19	0.17	🟥	🟥	🟥	8.27	7.93	0.34	🟥	🟥	🟥	6.44	6.1	0.34	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1821	Norwest Data Centre Modernisation	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1823	SYD051 Stage 5 Eastern Creek	20.08	19.74	0.34	25.18	24.5	0.68	31.18	30.5	0.68	15.71	15.04	0.67	34.01	33.33	0.68	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1824	Lindfield	429.5	422	7.43	122.2	121.1	1.08	93.01	89.54	3.47				28.08	27.11	0.97	🟥	🟥	🟥	27.34	27.15	0.19	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1833	Bluett Dr - Smeaton Grange	🟥	🟥	🟥	6.42	6.26	0.16	33.01	31.87	1.14	26.98	25.97	1.01	23.66	23.16	0.5	🟥	🟥	🟥	🟥	🟥	🟥	25.87	24.47	0.4	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1834	NorthConnex	14.77	14.09	0.68	19.83	19.5	0.33	40.42	39.75	0.67	37.62	36.78	0.84	45.56	44.55	1.01	67.16	66.48	0.68	🟥	🟥	🟥	19.74	19.57	0.17	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1902/1918	Picton High School	133.8	128.4	5.23	36.48	35.54	0.94	61.9	61.26	0.64	46.08	45.51	0.57	41.2	40.56	0.64	13.83	13.49	0.34	17.88	17.71	0.17	6.41	6.41		3.18	2.84	0.34	25.24	25.07	0.17	26.34	26.34		63.87	62.67	1.2
1903	Polair Bankstown																									19.38	18.93	0.44	15.23	15.06	0.17	2.21	2.21		9.81	9.17	0.65
1904	Willoughby Girls High School	125.4	123.5	1.9	56.61	55.93	0.68	35.49	34.81	0.68	38.79	37.98	0.81				81.41	81.07	0.34	65.42	65.08	0.34	🟥	🟥	🟥	🟥	🟥	🟥	86.76	85.62	1.13	🟥	🟥	🟥	🟥	🟥	🟥
1906	Greenwich Public School	4.49	4.32	0.17	10.69	10.52	0.17	58.58	57.42	1.16	41.47	41.13	0.34	55.45	54.77	0.68	21.24	21.07	0.17	61.37	61.04	0.33	🟥	🟥	🟥	75.98	75.47	0.51	72.19	71.01	1.18	57.18	56.61	0.58	27.13	27.13	
1908	Pendle Hill High School	3.67	3.56	0.11	24.88	24.77	0.11	53.48	53.1	0.38	42.32	41.87	0.45	25.71	25.31	0.4	18.18	17.95	0.23	35.53	35.23	0.3	84.82	84.29	0.53	48.31	47.97	0.34	34.43	33.64	0.79	27.91	27.24	0.68	34	33.32	0.68
1909	Yagoona Public School	3.24	3.08	0.16	10.56	10.22	0.34	9.26	8.92	0.34				16.43	16.1	0.33	30.22	30.05	0.17	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	68.4	67.56	0.84	🟥	🟥	🟥	🟥	🟥	🟥
1910	MPL Aldi	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	6.08	5.91	0.17	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1913	Eastern Creek	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	25.03	24.52	0.51	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1914	Smeaton Grange	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	9.68	9.68		19.26	19.03	0.23	🟥	🟥	🟥	9.15	8.85	0.3	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1915	Chullora Hard Stand										22.07	21.86	0.21	19.41	19.26	0.15	9.52	9.18	0.34	15.63	15.49	0.14	13.35	13.11	0.24	1.74	1.74		8.06	7.98	0.08	🟥	🟥	🟥	🟥	🟥	🟥
1916	Dee Why										3.28	3.16	0.12	8.62	8.36	0.26	37.74	37.4	0.34	28.43	27.86	0.57	15.57	15.41	0.16	23.17	23.02	0.15	47.99	46.93	1.06	60.67	59.39	1.28	76.64	75.2	1.43
1917	Chippendale																						4.86	4.69	0.17	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
1920	50 Norwest Blvd																						112.4	112	0.34	72.73	72.05	0.68	39.15	38.81	0.34	66.2	64.95	1.25	57.39	56.54	0.84
1922	Bowden Brae, Normanhurst																															10.31	10.14	0.17	12.1	11.37	0.73
1923	Gowrie Village																															0.35	0.35		🟥	🟥	🟥
2004	Stockland Yennora Resessed docks																															18.59	18.43	0.17	🟥	🟥	🟥
		1822			1437			1432			894.5			910.5			711.7			804.4			840			880.2			849.5			689.8			464.3		
			1785			1414			1399			877.3			892.4			703.2			788.4			832.1			873.6			838.8			679.8			455.4	
				37.14			23.73			32.59			17.15			16.6			7.01			8.82			7.03			6.64			10.7			10.03			8.84

6. APPENDIX 3 ASBESTOS MANAGEMENT PLAN:

Asbestos Management Plan for the Removal of Asbestos Contaminated Fill Soil

Kyeemagh Public School
Jacobson Avenue & Beehag Street, Kyeemagh NSW

Prepared for:
PF Civil
PO Box 4088
Winmalee NSW 2777

Prepared by:
P Clifton & Associates Pty Ltd
ABN: 69 041 751 671
PO Box 457, Turramurra NSW 2074
Mob: 0437 251 358

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Asbestos Management Plan for the
Removal of Asbestos Contaminated Fill Soil
Kyeemagh Public School
Jacobson Avenue & Beehag Street, Kyeemagh NSW

28 July 2020

Copies	Recipient
1	**PF Civil** PO Box 4088 Winmalee NSW 2777 Att: Mr Brendan Roots

This document was prepared for the sole use of PF Civil and the regulatory agencies that are directly involved in this project, the only intended beneficiaries of our work. No other party should rely on the information contained herein without the prior written consent of P. Clifton & Associates Pty Ltd and PF Civil.

By

P Clifton & Associates Pty Ltd
ABN: 69 041 751 671
PO Box 457
Turramurra NSW 2074

P. Clifton.

Philip Clifton
Principal
BOHS IP402 Certified
SafeWork NSW Licenced Asbestos Assessor: LAA000119

1 INTRODUCTION

This Asbestos Removal Management Plan (AMP) provides details of the scope of work, work procedure and occupational health and safety precautions to be observed for the removal of asbestos contaminated fill soil that is present in the eastern area of the Kyeemagh Public School located at Jacobson Avenue and Beehag Street, Kyeemagh NSW.

A recent detailed site investigation has identified fill soil containing asbestos cement sheet materials and debris to be present in the eastern area of the site near the boundary along Tancred Avenue.

The location of this fill soil is shown on the site plan in Appendix 1 at the rear of this report.

In order to safely remove the fill soil containing asbestos cement sheet debris and other building debris from the eastern area within the site, P. Clifton & Associates (PCA) have compiled this AMP which contains the scope of work, technical specification and information regarding the safe work procedures and regulatory requirements to be observed during the excavation and removal from site of the fill soil containing pieces and fragments of asbestos containing material.

2 RESPONSIBILITIES

2.1 Principal

Taylor Constructions as the head contractor on the site is the principal overseeing the removal and disposal of the asbestos contaminated fill soils.

The Principal will liaise with the client and other stakeholders as necessary for the removal of the asbestos contaminated fill soils that have been identified within the site.

2.2 Licenced Asbestos Assessor (LAA)

An experienced licenced asbestos assessor (LAA) will be engaged by the principal or the civil contractor to oversee the asbestos removal work and ensure that all OH&S requirements are fully complied with.

The LAA will be responsible for the following activities:

- Verifying that all persons working on the site (fill soil removal and disposal work) have current training certificates for the work that will be carrying out.
- Ensure that the safe work method statement (SWMS) for the asbestos removal contractor is completed and signed off.
- Undertake daily airborne asbestos fibre monitoring, as required.
- Undertake visual clearance inspections at the completion of asbestos removal work in each area, collect validation soil samples and compile validation report.

- Manage unexpected finds of asbestos containing materials identified on the site but outside of the asbestos removal work areas.

2.3 Asbestos Removal Contractor

The remediation contractor will be an experienced non- friable Class B licenced asbestos removal contractor (minimum licence requirement), who will undertake the asbestos removal and decontamination work at the site. The remediation contractor will be responsible for the following activities:

- The asbestos removal contractor's removal supervisor must oversee the work and must have completed an approved non-friable asbestos removal supervisor's course recognised by SafeWork NSW and Safe Work Australia.
- The asbestos removal contractor's personnel must have completed an approved non-friable asbestos removal workers course recognised by NSW WorkCover and Safe Work Australia.
- Undertaking removal of all asbestos contaminated soil and disposing of this contaminated waste at a suitably licenced landfill facility.
- Compliance with all safety requirements as detailed in this AMP and their site specific SWMS.

3 REGULATORY REQUIREMENTS

3.1 Statutory Regulations and Code of Practice

The removal and disposal of asbestos containing construction materials in NSW is overseen by various authorities including SafeWork NSW (SafeWork), the NSW Environment Protection Authority (NSW EPA), local government (council) by administering various legislation, regulations and codes of practice. Statutory documents that are applicable to the work include (but are not limited to) the following:

- NSW Work Health & Safety Act 2011.
- NSW Work Health & Safety Regulation 2017.
- How To Safely Remove Asbestos Code of Practice issued by Safe Work Australia, October 2018.
- How To Manage and Control Asbestos in the Workplace issued by Safe Work Australia October 2018.
- NSW Protection of the Environment Operations (General) Regulation 2009: Reg 92.
- NSW Protection of the Environment Operations (Waste) Regulation 2014: 'Sections 77 - 81.
- National Environment Protection (Assessment of Site Contamination) Measure. Schedule B (1) - Guideline on Investigation Levels for Soil and Groundwater (May 2013).
- enHEALTH Management of Asbestos in the Non-Occupational Environment (2005).

- NSW Environment Protection Authority (EPA) Waste Classification Guidelines – Part 1: Classification of waste (November 2014).

The proposed asbestos removal work at the site involves the excavation and stockpiling of the identified asbestos contaminated fill soil following which this soil is to be disposed of at a suitably licenced landfill facility.

3.2 Risk Assessment and Asbestos Classification

Health risk from asbestos containing materials only occurs from airborne asbestos fibres. Whilst asbestos containing materials remain undisturbed and there are no fibres being released from these materials then there is no actual risk posed. Materials which contain loose fibres have a high potential to generate airborne when disturbed.

In accordance with the NSW Work Health and Safety Regulation 2017, asbestos containing materials are classified as either 'friable' or 'non-friable' materials.

'Friable' asbestos containing materials are any material that contains asbestos and is in the form of a powder or can be crumbled, pulverised or reduced to powder by hand pressure when dry.

'Non-friable' asbestos containing material means any material (other than friable asbestos material) that contains asbestos. Typically, asbestos cement materials are classified as 'non-friable' asbestos containing materials. Surface fill soils within the eastern area in the site, in which fragments of asbestos cement sheet are present and which is not degraded from their original form is also classified as 'non-friable' asbestos containing material.

The removal of fragments of non-friable asbestos containing material and soil containing pieces and fragments of non-friable asbestos containing material from the nominated areas at the site is only to be carried out by a contractor holding a Class A licence for friable asbestos removal work or a contractor holding a Class B licence for non-friable asbestos removal work.

3.3 Asbestos Removal Permit and Licence for Non - Friable Asbestos Removal

The removal of the asbestos cement sheet materials, debris and soil containing fragments of non-friable asbestos containing material from the nominated areas at the site may only be carried out by an experienced asbestos removal contractor holding a contractor holding a Class A licence for friable asbestos removal work or a contractor holding a Class B licence for non-friable asbestos removal work. Prior to the commencement of the proposed work a notification of non-friable asbestos removal work is to be submitted from SafeWork NSW.

The work on site is not to commence until the notification for non-friable asbestos removal is approved by SafeWork NSW. There is usually a five day wait between the submission of the application for non-friable asbestos removal and the allowable commencement of the work.

A copy of the asbestos removal notification and asbestos removal licence is to be held on site at all times during the work.

3.4 Working Area

The Kyeemagh Public School is an operating school site and the asbestos removal contractor must ensure that all work is contained within the nominated asbestos removal areas at all times. Excavation, stockpiling and loading out of the asbestos contaminated fill soil is to only be undertaken during the nominated work hours. The storage of materials and equipment is available on site. All materials and equipment that are left on site should be secured to prevent access by members of the public and the responsibility for the security of these materials and the working areas is the sole responsibility of the contractor.

During the asbestos removal work at the site, the construction area in which asbestos removal work is on-going is to be secured using temporary fencing or other secure barricade to prevent access by unauthorised persons.

Where the work is not completed and disturbed asbestos containing and contaminated material remains in the work area, this area is to be secured to prevent unauthorised access. All exposed asbestos contaminated fill soil remaining at the end of each work day is to be covered with geo-fabric or plastic sheeting to prevent dust generation.

4 SCOPE OF WORK

The work that is to be completed at the site includes the excavation, stockpiling and loading out of asbestos contaminated soil located from the eastern area within the site.

In order to remove the in-situ asbestos contaminated fill soil from the nominated area within the site, the following scope of work is to be completed:

1. Establish fencing or barricades around the asbestos contaminated fill soil area. Asbestos warning signs are to be placed on the fence or barricades and are to remain in place until the asbestos contaminated soil removal work in the area is complete.
2. A decontamination and change area is to be established at the entry to the asbestos removal work area at the site.
3. Water is to be available at the site for use to suppress dust during the soil excavation and loading out.
4. The fill soil in the eastern area within the site is to be excavated and stockpiled following which the soil is to be loaded into covered leakproof bins and / or trucks (or plastic lined bins / trucks) for transport for a landfill facility licenced to accept the waste (based on the waste classification report).

5. The fill soil containing asbestos cement sheet debris extends to an approximate depth of 400 mm. At the completion of the excavation and loading out of the in-situ asbestos contaminated fill soil, the remaining soil to a depth of approximately 50 mm is to be ripped for visual inspection to confirm that all of the asbestos contaminated fill soil has been removed. Where further asbestos cement sheet debris in fill is found to be present, the soil containing these fragments is to be excavated and loaded out for off-site disposal as asbestos contaminated waste. The excavation and stockpile footprint areas are to be scrapped to ensure that all fill soil that was excavated and stockpiled has been fully removed.
6. A final visual asbestos material clearance inspection is to be carried out across the excavation and stockpile areas at the completion of the removal of all of the asbestos contaminated fill soil. The visual clearance inspection is to be carried out in accordance with the requirements of Section 3.10 of the How to Safely Remove Asbestos Code of Practice issued by Safe Work Australia.
7. In conjunction with the final visual inspection of the asbestos removal work area, validation soil sampling is to be carried out by the environmental consultant. Soil sampling is to be carried out in accordance with the methodology detailed in the "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 issued in 2013 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009".
8. A clearance / validation report detailing the scope of the remediation work, findings of the visual inspections and results of the validation sample analysis is to be compiled for asbestos contaminated work area(s) within the site. The clearance / validation report is to contain copies of all waste disposal documentation, airborne asbestos fibre monitoring reports and soil sample analysis reports.

5 ASBESTOS REMOVAL PROCEDURE

The asbestos work procedure detailed below is designed to minimise and control the potential exposure of persons undertaking the work and also to prevent the exposure of persons in adjacent areas to airborne asbestos fibres.

A safe work method statement for the asbestos removal work is to be compiled by the remediation contractor prior to undertaking the work.

The following procedure details the requirements for the removal of the asbestos contaminated fill soil containing fragments of asbestos cement sheet (non-friable asbestos containing material).

1. A barricade with asbestos removal warning signs is to be placed around the asbestos removal work area at the site.
2. A decontamination and change area is to be located at the entry to the non-friable asbestos removal work area.

3. All persons entering the asbestos removal work area are to wear disposable coveralls and Class P2 or P3 respiratory equipment. Prior to leaving the work area, persons are to remove their PPE in the decontamination area.
4. The transport of the asbestos contaminated waste is to be undertaken in covered leak proof vehicles and is to be disposed of at a landfill site that can lawfully receive this waste as detailed in the ‘Special Requirements Relating to Asbestos Waste’ in the Protection of the Environment Operations (Waste) Regulation 2005. Truck access and egress to the site is to be carried out as per the traffic management plan prepared for truck movements to the site.
5. A machine / truck parking area is to be located adjacent to the decontamination and change area. Operators are only to enter / exit the machine / trucks in this area. Wheels are to be washed to remove asbestos contaminated soil prior to the machines / trucks entering this area.
6. At the completion of the asbestos removal work each day, the remaining exposed in -situ soil and stockpiled soil is to be covered with geo-fabric or plastic sheeting.
7. A final visual inspection is to be carried out across the asbestos contaminated soil removal area at the completion of the removal of asbestos contaminated fill soil. In conjunction with the final visual inspection, validation soil sampling is to be carried out by the environmental consultant. Validation soil samples are to be collected with sampling to be undertaken in accordance with the sample design guidelines issued by the NSW EPA for soil sampling as part of site assessment investigations.
8. Upon receipt of the results of the soil sample analysis showing the sampled soil to be free of asbestos fibre contamination (below the site acceptance criteria of 0.01% weight / weight for asbestos containing material (ACM) and each of the soil samples was found to be below the acceptance level of 0.001% weight / weight for fibrous asbestos (FA) and asbestos fines (AF), the barricades surrounding the asbestos removal areas may be removed and the area opened for unrestricted access.

6 REQUIREMENTS FOR ASBESTOS REMOVAL WORK

The asbestos removal work at the site is to be carried out in accordance with the requirements for the removal of non-friable asbestos containing material as detailed in the NSW Work Health and Safety Regulation 2017 and the Safe Work Australia How to Safely Remove Asbestos Code of Practice issued in October 2018.

A summary of the main requirements to be implemented for the work is as follows:

The asbestos removal work areas shall be contained within the nominated area at the site.

Warning signs are to be placed at the entry to the asbestos removal work area and should read "Asbestos Work Area, No Unauthorised Entry". These signs are to comply with Australian Standard 1319-1983: Safety signs for the occupational environment.

A change and decontamination area (designated area for changing into and out of asbestos PPE, no wet shower facilities required) is to be located at the entry to the 'non-friable' asbestos removal work area. All persons entering these asbestos removal work areas are to change into asbestos protective equipment in the change area and undergo decontamination prior to leaving the work area. All asbestos PPE is to be removed in the decontamination area when exiting the work area(s).

6.1 Asbestos Removal Training and Health Assessment

The asbestos removal contractor shall provide instruction to all persons involved in the asbestos removal work that may be exposed to asbestos in the course of the work regarding the danger to health and the statutory requirements that are required to provide safe working conditions.

The asbestos contractor's staff, including all machine operators, involved with the removal of the asbestos containing materials must also be formally trained in safe non-friable asbestos removal working procedures and in the wearing and maintenance of protective clothing and equipment. The supervisor on the site is to have completed formal training in the supervision of non-friable asbestos removal. Evidence of this training is to be held on site.

All persons involved in the licenced asbestos removal work are to have completed current health assessments in accordance with Clauses 435 and 436 of the NSW WHS Regulation 2017.

6.2 Personal Protective Equipment

All persons entering the work areas (to undertake asbestos removal work) are to wear disposable coveralls, disposable or re-usable Class P2 or P3 respirator and washable boots.

Operators of machines and trucks involved in the work are not required to wear asbestos PPE provided that the cabins of their machine / truck are air conditioned and that the air conditioning remains in operation at all times.

A machinery parking area is to be located adjacent to the decontamination and change area. Operators are only to enter / exit the machines in this area. Operators not wearing asbestos PPE are not permitted to exit the machines within the asbestos work area.

Re-usable respirators are to be issued to each person entering the work area and are to be cleaned prior to leaving the asbestos work area.

Persons entering the work areas for supervision or inspection of the work are to wear disposable coveralls, Class P2 half face respirator and washable boots. Disposable Class P2 half face dust masks may be used.

All persons entering the work area are to be instructed on the correct fit and wearing of the respirator. No person with a beard shall be permitted to enter an asbestos removal work area. Disposable items of PPE are not to be taken outside of the asbestos removal work area. When leaving the work area, disposable items of PPE are to be placed into asbestos waste bags for disposal as asbestos contaminated waste.

Reusable items such as boots are to be thoroughly cleaned in the decontamination unit prior to leaving the work area.

The laundering of approved non-disposable protective clothing shall be carried out in accordance with the procedures approved by SafeWork NSW. Waste water from washing of contaminated clothing is to be filtered prior to disposal to the sewer and clothes dryers used for drying clothes or towels are to be filtered through a HEPA filter.

6.3 Decontamination Facilities

For the removal of non-friable asbestos containing materials, a designated decontamination area is to be established at the entry to the asbestos removal area. All persons entering the asbestos removal area are to change into / out of their PPE in the designated decontamination area. Wet shower facilities are not a mandatory requirement for non-friable asbestos removal, however they may be provided by the contractor if they wish to do so.

When leaving the work area, the following decontamination procedure is to be followed:

- Remove any visible asbestos dust/residue from protective clothing using an asbestos vacuum cleaner or wiping down with damp cloths. Warning: do not reuse or resoak damp cloths.
- Carefully remove disposable protective clothing and place into bags, (RPE must still be worn).
- Place cloths into asbestos waste disposal plastic bag (200 µm thick).
- Take disposable coveralls off and place into asbestos waste disposal bag (RPE must still be worn).
- Use damp cloths to wipe down footwear and place cloths into asbestos waste disposal bag.
- Seal all asbestos waste plastic bags with duct tape and place each into a second plastic bag.
- Seal this second plastic bag and label/mark as ‘Asbestos Waste’.

- Use damp rags to wipe external surfaces of the asbestos waste disposal bags to remove any dust before it is removed from the asbestos removal work area.
- Remove PPE and double bag, seal with duct tape and mark as ‘Asbestos Waste’.
- Remove non-disposable PPE and place in container labelled as containing asbestos.
- Remove disposable RPE and double bag, seal with duct tape and mark as ‘Asbestos Waste’.
- Reusable RPE is to be wiped with damp cloth and bag for reuse. Place the damp cloth into a disposable asbestos waste bag.
- Ensure the outside of the bags are decontaminated by using a damp cloth.
- Place the damp cloth into disposable asbestos waste bags.
- Dispose of asbestos waste at the appropriate waste facility.

6.4 Disposal of Asbestos Contaminated Waste

The asbestos contaminated soil is to be loaded into skip bins or trucks with loading to be undertaken as close as possible to the stockpile excavation area to minimise the likelihood of asbestos contamination occurring in adjacent areas where no asbestos contamination has been identified.

As far as practically possible vehicles are not to drive on soil on / in fill soil areas in which there is asbestos cement sheet debris. Where this is unavoidable, a wheel wash is to be located at the entry / exit to the asbestos removal work area. Wheels are to be washed to remove asbestos contaminated soil prior to the trucks exiting the asbestos removal work area. Water from the wheel wash is to be directed into the asbestos removal work area. Asbestos contamination within this water is to be captured in the soil which is to be excavated for disposal as asbestos contaminated waste.

The asbestos waste is to be transported to the landfill site in covered leak-proof vehicles with the soil to be wetted sufficient to prevent water leakage and dust emissions during transport to the landfill site.

Documentary evidence of the correct disposal of the waste shall be provided. This documentation will include name of authorised tip, weigh bridge docket and registration number of vehicle for every disposal.

All small items of asbestos contaminated waste from the work such as used disposable PPE is to be double bagged in 0.2 mm asbestos waste bags for disposal at a landfill facility licenced by the NSW Environment Protection Authority (NSW EPA).

This waste material is to be placed into the first asbestos waste bag at the work face and sealed. This bag is to then be placed into a second waste bag away from the work face (but within the work area). Each bag is to separately 'goose necked' and sealed with tape. The waste material is to be wetted prior to placement in the bag.

7 AIRBORNE ASBESTOS FIBRE MONITORING

Monitoring for airborne asbestos fibres should be carried out at all times throughout the duration of the asbestos contaminated soil removal work by a licenced asbestos assessor (LAA) engaged by PF Civil.

Monitoring is to be carried out in accordance with the requirements of the National Occupational Health and Safety Commission (NOHSC) Code of Practice for the Safe Removal of Asbestos, particularly the 'Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres' 2nd edition [NOHSC:3003(2005)]. Analysis of the air monitoring filters is to be carried out by a NATA accredited laboratory.

Air monitors are to be placed in the decontamination / change area and on the temporary fencing or barricade surrounding the asbestos removal work area. Up to four monitors are to be placed on the perimeter of the asbestos removal work area.

The daily reports of the results of the air monitoring will be forwarded to PF Civil.

The NOHSC recommended maximum exposure level for airborne asbestos fibres, measured as a time weighted average over an 8 hour work shift, is 0.1 fibres per millilitre of air (0.1 fibres/ml).

The NOHSC Code of Practice for the Safe Removal of Asbestos details control levels for airborne asbestos fibre concentrations that are to be observed during the work. These control levels are as follows:

Airborne fibre concentration (fibres/ml)	*Control Measure*
<0.01	Continue work using existing asbestos dust control measures
≥0.01	Continue work and review asbestos dust control measures
≥0.02	Stop work, identify cause of dust emissions and revise dust control measures.

8 VALIDATION INSPECTION AND SAMPLING

At the completion of the asbestos removal work across the nominated eastern area within the site, a visual inspection is to be undertaken to verify that the exposed soil surface across the area in work was completed is free of visible asbestos containing material. This inspection is to be carried out in accordance with the requirements of Section 3.10 of the How to Safely Remove Asbestos Code of Practice issued by Safe Work Australia.

This inspection is to be undertaken by walking over the nominated area of the site in a systematic manner at 2 metre intervals in a north / south direction. A second walkover inspection at 2 metre intervals is then to be undertaken in an east / west direction.

Validation soil samples are to be collected by the environmental consultant with sampling to be undertaken in accordance with the sample design guidelines issued by the NSW EPA. The number of soil samples is to be in accordance with the validation sampling requirement in the remediation action plan prepared for the site.

Soil sampling is to be carried out in accordance with the methodology detailed in the "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 issued in 2013 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009".

A validation report detailing the scope of the remediation work, findings of the visual inspections is to be compiled. The validation report is to contain copies of all waste disposal documentation, airborne asbestos fibre monitoring reports and soil sample analysis reports. The validation report is to be prepared in accordance with the NSW EPA contaminated site guidelines.

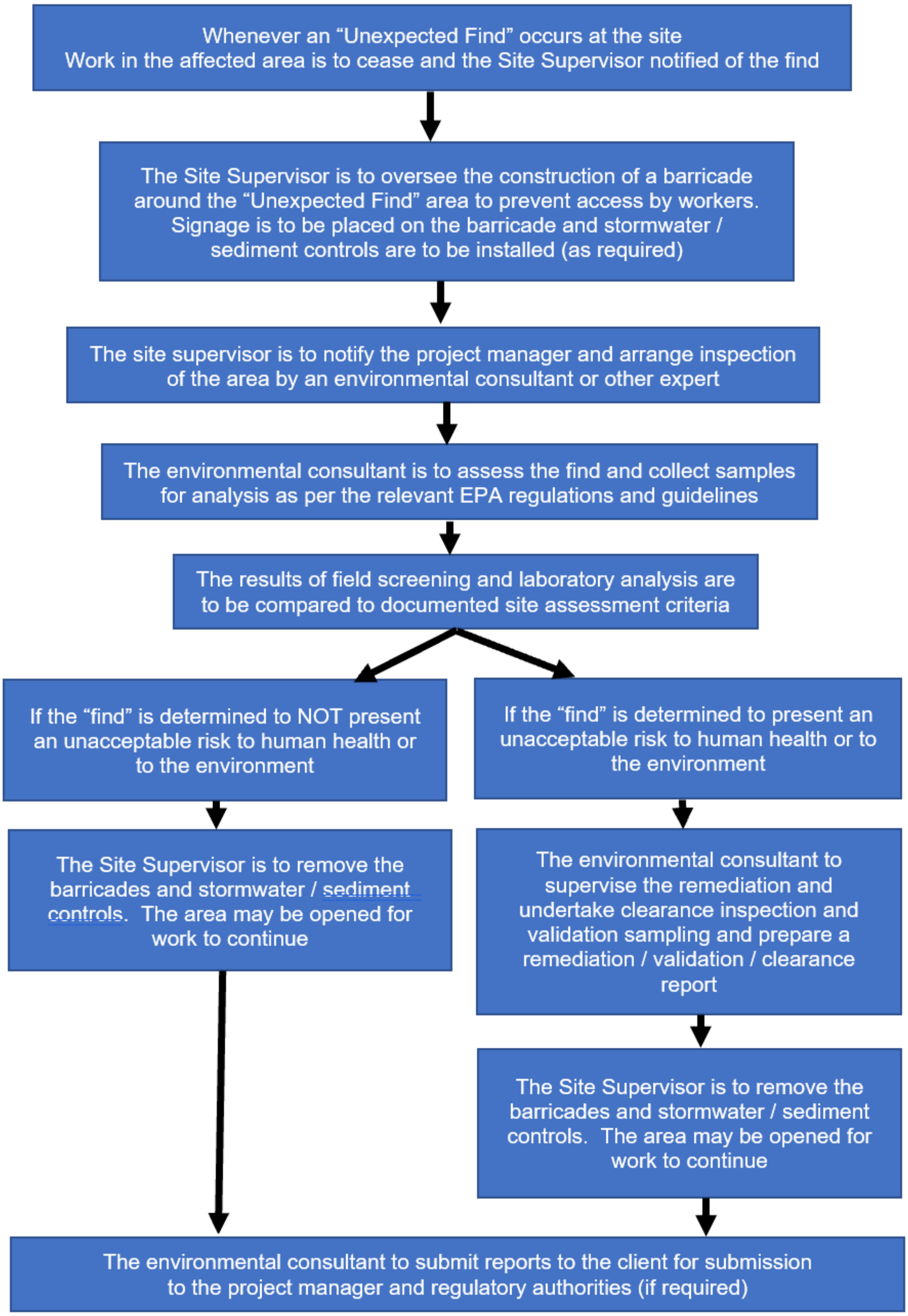
9 PROCEDURE FOR DEALING WITH UNEXPECTED FIND OF ASBESTOS CONTAINING MATERIAL OUTSIDE OF ASBESTOS REMOVAL WORKING AREA

Whilst undertaking the asbestos contaminated soil removal work at the site, and during the remaining in-ground work, there is a possibility that previously unidentified asbestos containing material may be encountered outside of the asbestos removal area at the site.

In the event that asbestos containing material is identified outside of the asbestos removal work area, the following procedure is to be followed:

1. Upon discovery of a fragment(s) of asbestos cement or other asbestos containing material (or suspected asbestos containing material) all work in the immediate area is to cease.
2. The worker discovering the material is to inform his supervisor who in turn will advise the LAA.
3. The LAA will arrange for the area to be secured to prevent disturbance of the material. Where necessary, temporary fencing and warning signs are to be placed around the area.
4. The LAA will arrange, if necessary, for a sample of the material to be analysed to confirm the presence / absence of asbestos fibres.
5. Where the material is confirmed as containing asbestos, the asbestos removal contractor is to remove the material for disposal asbestos contaminated waste.
6. Where the material consists of a small number of fragments of asbestos cement sheet, asbestos PPE including disposable gloves is to be worn during the collection of the material. The fragment(s) will be picked up and the glove turned inside out to ‘bag’ the fragment(s). The disposable glove containing the fragment(s) of asbestos cement sheet will then be placed directly into an asbestos waste bag for disposal.
7. The area is to be visually inspected by the LAA to verify that all of the asbestos containing material has been removed. A clearance report is to be compiled following the inspection.
8. Where a larger quantity of asbestos containing material is identified, the soil containing the asbestos containing material is to be excavated in accordance with the procedure detailed in Section 5 above. A visual inspection and validation sampling is to be undertaken and the details of this work are to be recorded in the validation report.

The above procedure is summarised in the following flowchart:



Whenever an "Unexpected Find" occurs at the site
Work in the affected area is to cease and the Site Supervisor notified of the find

The Site Supervisor is to oversee the construction of a barricade around the "Unexpected Find" area to prevent access by workers. Signage is to be placed on the barricade and stormwater / sediment controls are to be installed (as required)

The site supervisor is to notify the project manager and arrange inspection of the area by an environmental consultant or other expert

The environmental consultant is to assess the find and collect samples for analysis as per the relevant EPA regulations and guidelines

The results of field screening and laboratory analysis are to be compared to documented site assessment criteria

If the "find" is determined to NOT present an unacceptable risk to human health or to the environment

The Site Supervisor is to remove the barricades and stormwater / sediment controls. The area may be opened for work to continue

If the "find" is determined to present an unacceptable risk to human health or to the environment

The environmental consultant to supervise the remediation and undertake clearance inspection and validation sampling and prepare a remediation / validation / clearance report

The Site Supervisor is to remove the barricades and stormwater / sediment controls. The area may be opened for work to continue

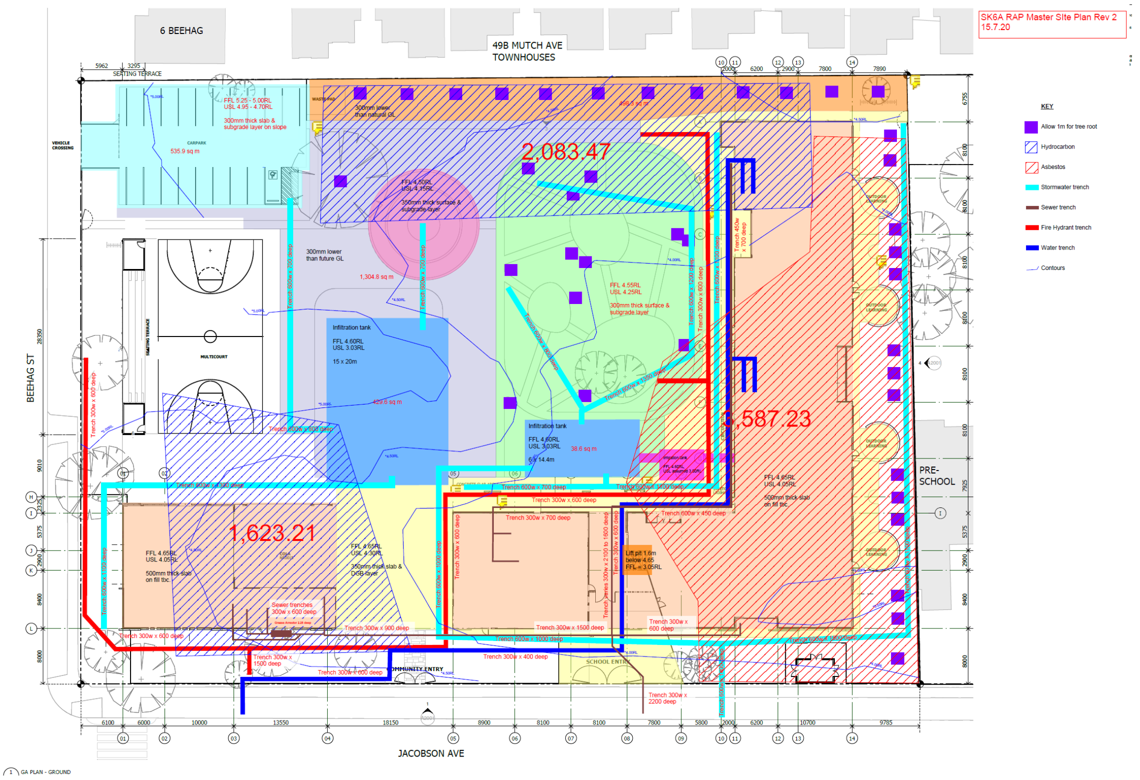
The environmental consultant to submit reports to the client for submission to the project manager and regulatory authorities (if required)

10 REFERENCES

- NSW Work Health & Safety Act 2011.
- NSW Work Health & Safety Regulation 2017.
- How To Safely Remove Asbestos Code of Practice issued by Safe Work Australia, October 2018.
- How To Manage and Control Asbestos in the Workplace issued by Safe Work Australia October 2018.
- NSW Protection of the Environment Operations (General) Regulation 2009: Reg 92.
- NSW Protection of the Environment Operations (Waste) Regulation 2014: 'Sections 77 - 81.
- National Environment Protection (Assessment of Site Contamination) Measure. Schedule B (1) - Guideline on Investigation Levels for Soil and Groundwater (May 2013).
- enHEALTH Management of Asbestos in the Non-Occupational Environment (2005).
- NSW Environment Protection Authority (EPA) Waste Classification Guidelines – Part 1: Classification of waste (November 2014).

APPENDIX 1

SITE PLAN



Site plan with the red shaded area showing the approximate location of the asbestos contaminated fill soils

Taylor Construction Group Pty Ltd
ABN 25 067 428 344

Level 13, 157 Walker St, North Sydney NSW 2060
T 02 8736 9000 F 02 8736 9090

■ ■ ■

taylorau.com.au

TAYLOR

APPENDIX 11: CONSTRUCTION SOIL & WATER SUB PLAN

BIRZULIS ASSOCIATES Pty Ltd
Consulting Structural + Civil Engineers
ACN 003 797 911 ABN 99 003 797 911

Sydney Office
583 Darling Street, Rozelle NSW 2039
Telephone: 9555 7230
Email: office@birzulisassociates.com
Newcastle Office
105 Merewether Street, Merewether NSW 2291
Telephone: 4049 4855
Email: office@birzulisassociates.com

CONSTRUCTION SOIL AND WATER MANAGEMENT PLAN

OUR REF:7863

KYEEMAGH PUBLIC SCHOOL
JACOBSON AVENUE,
KYEEMAGH NSW 2261

PREPARED BY: CAMERON AMRI
DATE: 03/07/2020
REVISION: **E**

DIRECTORS
B Fimmano B.E. (Hons), M.I.E. Aust., C.P.Eng.
M A Grogan B.E., M.Eng., M.I.E. Aust., C.P.Eng.
ASSOCIATE DIRECTOR
P W Grogan B.E. (Hons), M.E.(Struct), M.I.E. Aust., C.P.Eng.
CONSULTANT
A J Birzulis OAM, B.E., M.Eng. Sc., F.I.E. Aust., C.P.Eng.

DOCUMENT VERIFICATION

Project Title	Kyeemagh Public School
Document Title	Construction Soil and Water Management Plan Report
Project No.	7863
Description	Construction soil and water management plan
Client Contact	Taylor Constructions

	Name	Signature
Prepared by	Cameron Amri	Cameron Amri
Checked by	Michael Grogan	
Issued by	Michael Grogan	

REPORT DELIVERABLES

This report is to meet condition B17 of the SSD Conditions.

This report shall be referenced to meet condition B12 & B17 of the SSD Condition of application number SSD 9439.

Condition	Condition requirements	Document reference
B17	The Applicant must prepare a Construction Soil and Water Management Sub-Plan (CSWMSP) and the plan must address, but not be limited to the following:	
	be prepared by a suitably qualified expert, in consultation with Council;	Appendix B & Appendix C.
	describe all erosion and sediment controls to be implemented during construction including, as a minimum, measures in accordance with the publication Managing Urban Stormwater: Soils & Construction (4th edition, Landcom 2004) commonly referred to as the 'Blue Book'.	Appendix D
	include an Acid Sulfate Soils Management Plan, including measures for the management, handling, treatment and disposal of acid sulfate soils, including monitoring of water quality at acid sulfate soils treatment areas;	Section 2.2 & Appendix A
	provide a plan of how all construction works will be managed in a wet-weather events (i.e. storage of equipment, stabilisation of the Site);	Section 5.4 & Appendix D
	detail all off-Site flows from the Site; and	Section 2.5 & Appendix D
	describe the measures that must be implemented to manage stormwater and flood flows for small and large sized events, including, but not limited to 1 in 1-year ARI and 1 in 5-year ARI.	Section 5.4

B12	Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:	
	(a) detailed baseline data;	Section 2
	(b) details of: (i) the relevant statutory requirements (including any relevant approval, license or lease conditions);	Section 1.1
	(ii) any relevant limits or performance measures and criteria; and	Section 6

	(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 6.5
	(c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Section 6 & Appendix D
	(d) a program to monitor and report on the: (i) impacts and environmental performance of the development;	Section 6.5.5 & 6.5.6 & 6.5.7
	(ii) effectiveness of the management measures set out pursuant to paragraph (c) above;	6.5.7
	(e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Appendix A
	(f) a program to investigate and implement ways to improve the environmental performance of the development over time;	Section 5
	(g) a protocol for managing and reporting any: (i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria);	Section 6.4 & 6.5.5 & 6.5.6
	(ii) complaint;	6.5.7
	(iii) failure to comply with statutory requirements; and	6.5.6
	(h) a protocol for periodic review of the plan and any updates in response to incidents or matters of non-compliance	6.5.5

DOCUMENT HISTORY

Date	Revision	Issued to	Description
03/07/20	-A	DWP Suters	DRAFT Issue
30/07/20	-B	DWP Suters	DRAFT Issue
30/07/20	-C	DWP Suters	For CC1
14/09/20	-D	Taylors	For Construction
14/09/20	-E	Taylors	For Construction

Table of Contents

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1 EXECUTIVE SUMMARY

Birzulis Associates have been commissioned by Taylor Constructions to prepare a Construction Soil and water Management Plan (CSWMP) for the proposed stage 1 and stage 2 construction at Kyeemagh Public School. This report addresses the site conditions and the management of such site conditions relevant to soil and water management in accordance with the requirements of the relevant Council DCP/SSD Guidelines.

The aim of this CSWMP is to address all risks associated with the water quality, erosion and sedimentation ensuring these are considered and managed effectively during construction. This reports aims to deliver a best-practice control and procedures to minimise or avoid erosion/sedimentation impacts and potential impacts to water quality.

The CSWMP will address and satisfy the following objectives:

- Relevant environmental legislation as it applies to this project
- Summarise and address potential water quality impacts on the environment from the proposed works on the proposed site
- Document procedures to control these possible and foreseeable environmental impacts.
- Ensure and demonstrate compliance to relevant legislation
- Ensure there are no adverse environmental impacts to the waterways and surrounding environment as a result of the proposed works.
- Address and comply with water quality discharge requirements for the site.
- Prevent pollution of surface water by sedimentation and excessive erosion of the site.
- Ensure staff and relevant construction personnel and procedures and an understanding of what is required to maintain and implement the required water quality elements and controls.
- Document all controls and mitigation for a 1 in 100 year flood event at the site.

Stage 1 of the proposed works involves the demolition of the existing buildings to the North-East of the site and construction of the buildings on that half of the site.

Stage 2 of the proposed works will occur approximately after practical completion (PC) of the stage 1 works and the demolition of the existing buildings to the South-West half of the site.

Both stages of the development will require:

- Demolition of the existing structures and removal of waste.
- Removal of topsoil and vegetation.
- Civil works and stormwater drainage works including connecting to the existing Council trunk drainage system.
- Construction of temporary roadway and turning circle for construction vehicles/equipment withing the envelope of the stage works.
- Remediation of temporary works and construction of hardstand pavements
- Construction of landscaping works

1.1 PLANNING RELEVANCE, LEGISLATION & ACT

The following legislation and regulatory framework relating to construction soil and water management are outlined below.

Immediate SSD Planning Requirement to be satisfied:

- As stipulated in the State Significant Development Conditions of Consent. Condition B17 required prior to the commencement of construction.

Environmental Planning and Assessment Act 1979 & Environmental Planning & Assessment Regulation 2000.

This Act and regulation establishes a system of environmental planning and assessment of development proposals for the State. This project has been assessed and approved under Section 89E of the Environmental Planning and Assessment Act 1979.

Project Relevance; Approval process for a legal Consent to develop and considerations for such.

Protection of the Environment Operations Act 1997

This Act includes all the controls necessary to regulate pollution and reduce degradation of the environment, provides for licensing of scheduled development work, scheduled activities and for offences and prosecution under this Act.

Project Relevance; This Act is of high relevance to the Project as it provides for the issuing of environmental protection notices to control work and activities not covered by licences. Section 148 of the Act requires a pollution incident-causing or threatening material harm to the environment to be notified to the EPA and other authorities immediately.

Contaminated Land Management Act 1997

This Act provides for a process to investigate and remediate land that has been contaminated and presents a significant risk of harm to human health. Section 60 of the Act is a “Duty to Report Contamination”. This duty applied to owners of land and persons who become aware that their activities have contaminated the land.

Project Relevance; The relevance of this Act will be in the event that suspected or potentially contaminated ground is found during construction activities.

Commonwealth Environment Protection and Biodeversity Act 1999

The main purpose of this Act is to provide for the protection of the environment especially those aspects that are of national environmental importance and to promote ecological sustainable development. The Act binds the Crown. Do not take, use, keep or interfere with “nationally significant” cultural and natural resources, protected wildlife and protected plants without approval.

Project Relevance; This Act is of little relevance to this project as it has been determined not to trigger the provisions of the act.

Soil Conservation Act 1938

This Act makes for the provision for the conservation of soil resources, farm water resources and the mitigation of erosion. The Act is binding on the Crown; however, the Crown is not liable for prosecution. The Act provides for notification in the government gazette catchments where erosion is liable to cause degradation of rivers and lakes (i.e. protected land).

Project Relevance; This Act has low relevance as the site is not located within “protected land”. Further, such notification has not been given to the owner of the land.

Water Management Act 2000 & Water Management (General) Regulation 2004

This Act and Regulation provide for the protection, conservation and ecologically sustainable development of water sources of the State and in particular to protect, enhance and restore water sources and their associated ecosystems.

Project Relevance; This Act has no direct relevance at this time to the construction work under this contract. The project approval does not trigger the provisions of this Act

Water Act 1912

This Act provides for licences to extract water for construction purposes either from surface or artesian sources. Should construction water be extracted from surface (other than sedimentation ponds) or artesian sources, a licence will be required.

Project Relevance; This Act has no relevance as it is not proposed that construction water will be obtained from surface (for example, creeks, lakes) or artesian sources.

Rivers and Forseshores Improvement Act, 1948

The Rivers and Foreshores Improvement Act, 1948, is administered by DIPNR for regulating operations involving excavation and fill within the immediate vicinity of coastal rivers, lakes and estuaries. Under this Act, a Part 3A Permit is required for the undertaking of works within 40 metres of the bed and banks of a watercourse. By late 2003, the Water Management Act 2000 (WMA) will have repealed the Rivers and Foreshores Improvement Act, 1948 (RFIA). When this occurs, activities that require a Permit under Part 3A Approvals under the RFIA will require Controlled Activity Approvals under the WMA

Project Relevance; Nil as not within 40mof the bed and banks of a watercourse.

2 EXISTING CONDITIONS

2.1 LOCATION

The site is located at 30A Jacobson Avenue, Kyeemagh NSW 2216 is broken up into two lots D.Ps (D.P.120095 & D.P. 335734). The current site is the operating site of Kyeemagh Public School. The site is generally sparsely planted and with minimal hard pavements.

To the North-West the site abuts a previous townhouse villa style development. To the South-East the site abuts Beehag Street. To the South-East the site abuts Jacobson Avenue. To the North-East the site abuts the school childcare centre which operates on the site and is not proposed to be altered. The site falls from the West to the South East at approximately 4%.

The total site area is 10 329m².

The site is shown below represented as Figure 2.1

Figure 2.1.1 – Total D.P. Envelope

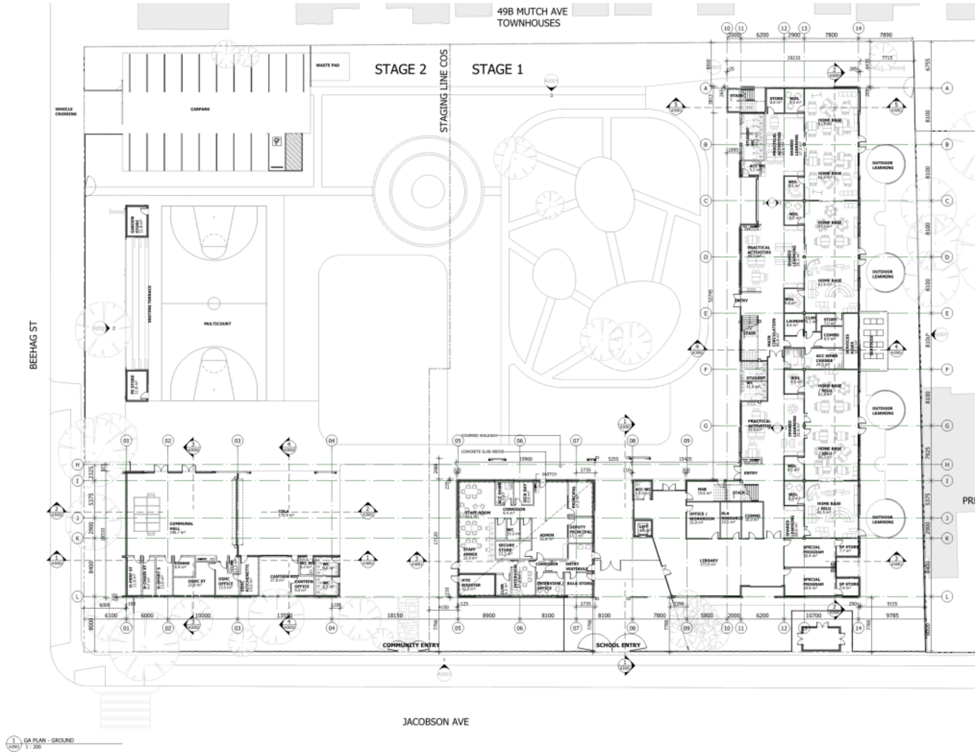


Figure 2.1.2 - Overall Site Plan

Figure 2.1.3 - Aerial View of Kyeemagh Public School (Source: Google Map 2020)

2.2 ACID SULFATE SOILS

A review of the Acid Sulfate Soil Map from the Rockdale Council LEP shows the site to be in a Class 2 Acid Sulfate Soil area. Should acid sulfate soils be encountered they shall be dealt with in accordance with the Acid Sulfate Soils Management Plan located as Appendix A.

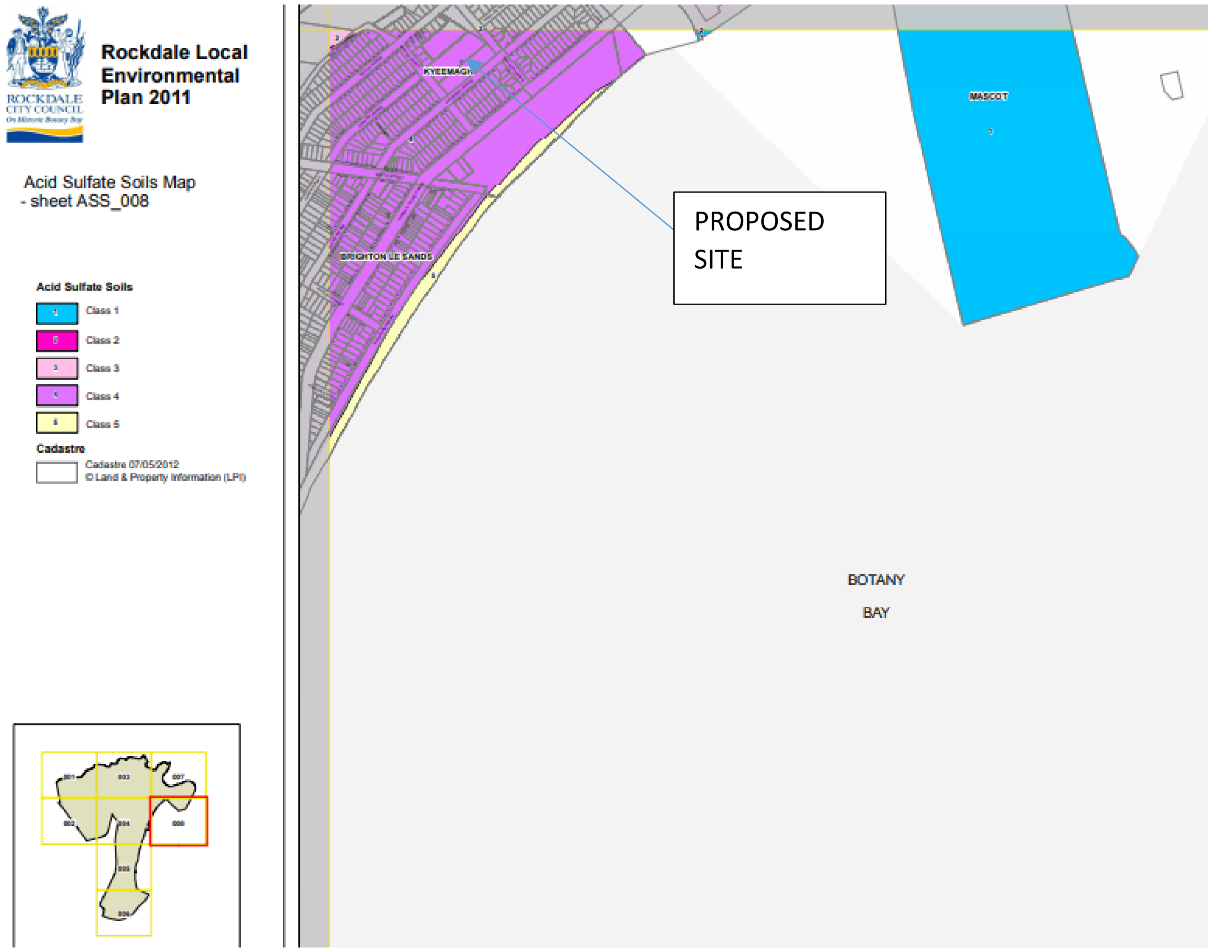


Figure 2.2.1 – Extract from Rockdale LEP 2011

A review of the Geotechnical report completed by Cardno showed soil test pH levels from 6.1 to 7.7 which is considered neutral.

Acid sulfate soil planning maps are indicative and on-site observations and testing should also be used to identify acid sulfate soils. The below shall be used to use visual guidance for more specific onsite assessment.

Potential acid sulfate soil indicators:

- Presence of mangroves, reeds, rushes, salt marsh or swamp vegetation etc
- Sulfurous (rotten egg gas) smell after rain, following a dry spell or when the soils are disturbed • Marine or estuarine sediments
- Soils can be described as unripe muds/sediments (soft, buttery, blue grey or dark greenish grey) which can include sands and gravels

- Milky blue/green water
- Shell fragments in the soil • Waterlogged, scalded or back swamp areas
- Land below 5m AHD elevation

Actual acid sulfate soil indicators:

- Any jarosite (a pale yellow mineral deposit) or iron oxide (rusty) colouring
- Extensive iron stains on any drain surfaces, or iron stained drain water and ochre deposits
- Corrosion of concrete and/or steel structures
- Surface or ground water on or draining from the site with a pH < 5.5, or of an unusually clear or milky green
- Sulfurous (rotten egg gas) smell when soils are disturbed

Class 2 Acid sulfate soils are where acid sulfate soils are likely to be found below the natural ground surface. Any works beneath the natural ground surface or works which are likely to lower the water table may encounter acid sulfate soils.

As the site is within an Acid Sulfate “likely” zone and there is cutting of soil proposed there is a risk acid sulfate soils may be encountered. We recommend further testing be undertaken in areas where soil levels are proposed to be reduced by 1m.

The referenced Acid Sulfate Soil Management Plan is the reference to manage the acid sulfate soil particularly for investigation, handling, treatment, and management of such soils.

The Acid Sulfate Soil Management Plan is referenced in this report and more relevant management and treatment of such soils are extracted and located in Appendix A. Section 4 & 5 of that report itemised the management procedures required to manage Acid Sulfate soil after it is identified.

Section 5.2 to 5.8 are attached in Appendix A is they specifically relate to mitigation and management of Acid Sulfate Soils for this site.

2.3 GROUND WATER PROTECTION

Generally possible sources of ground water contamination can be linked to :

- Industrial effluent and manufacturing wastes

- Leaking underground storage tanks and pipe lines (not stormwater/rainwater)
- Landfill stockpiles or contaminated soil producing leachate ‘
- Intensive agricultural fertiliser and pesticide use or waste generation
- Contamination from septic tanks and from sewerage and wastewater lagoons
- Mining industry processes and wastes
- Contamination from wells
- Urban stormwater
- Atmospheric fallout
- Inter-aquifer contamination by alteration of flow
- Chemical storage

We assess the operation use of the site is not such as to generate a risk to ground water contamination subject to correct chemical storage in line with MSDS’s and safe work guidelines.

2.4 TEMPORARY EROSION AND SEDIMENT CONTROL BASINS

The requirement for sediment basins is carried out using a RUSLE calculation.

A=R K LS C P

Where A = Computed soil loss (tonnes/ha/yr)

R = rainfall erosivity factor = 2075

K = slope erodibility factor

LS = Slope length/gradient factor

C = ground cover factor

P = practice factor

Variable	**Value**	**Remark**
Rainfall Erosivity (R)	3075	From literature review
Soil erodibility (K)	0.06	Figure A3, The Blue Book
Site slopes av	Pre- 0.8% post 0.8%	
Slope Length (LS)	0.52	Table A1, The Blue Book
Erosion control practice (P)	1.3	Table A2, The Blue Book
Ground cover (C)	1.0	50% grass cover as construction completed in stages Figure A5, The Blue Book
Potential Erosion Hazard	Low	Figure 4.6, The Blue Book
Rainfall Zone	Zone 1	Figure 4.9, The Blue Book

Soil Density (kN/m³)	19	From geotechnical report
Calculation soil loss A (t/ha/yr)	125	
Soil Loss Class	1 (erosion hazard = very low)	Table 4.2, The Blue Book
Soil loss (m³/ha/yr)	96	
Is a sediment basin required	**No**	

Where the soil loss from the catchment/s is less than 150m³/ha/yr then a sediment is not required as per Section 6.3.2.d of the Blue Book.

Nil

2.5 EXISTING STORMWATER DISCHARGE POINTS

The site operating as a public school has an existing pit and pipe system with an existing discharge to the Council trunk drainage system on Jacobson Avenue (located in the stage 2 envelope of works). The site also has a small depression within the site which normally would contribute to saturation of the soil however is not considered to do so given the high permeability of the soil (marine sand).

The low point of the site is located at the Eastern corner. The low point of the site is not proposed to be altered from the current condition. The overland flow water that discharges the site from this low point falls to Jacobson Avenue.

The existing stormwater elements from a visual survey undertaken revealed the onsite system to be in poor condition and blocked in many cases. We are proposing to clean the existing system for the construction works to not be surcharged by storm flows during the Stage 1 works.

The indicative external stormwater network is shown in **Error! Reference source not found.** and is t he Council trunk drainage system and is believed to be in a satisfactory condition.

3 GENERAL INSTRUCTIONS

This SWMP shall be read in conjunction with the latest engineering plans which have the Sediment and Erosion Control Plan and details, any other reports or design drawings and or any written instructions that concern themselves with water management of the site during construction and during the operational phase of the site.

The Principle Contractor shall ensure that all soil and water management works recommendations are incorporated in works and undertaken in accordance with the Blue Book.

4 LAND DISTURBANCE CONDITIONS

Where practical, the soil erosion onsite will be as recommended below so the hazard will be as low as reasonably possible.

Land Use	Scope	Remarks
Construction areas	Disturbance to be no greater than within 5m from the edge of any essential construction activity shown on the plans	Barrier fencing and sediment fencing or similar fencing to be used so all workers can clearly identify these zones were appropriate.
Access areas	Maximum 6m in width	Site manager to define the zones onsite and all workers to clearly be able to identify these zones
Remaining Lands	Fenced off	Identified by barrier fencing

5 ASPECTS, IMPACTS AND RISKS

5.1 STORMWATER QUANTITY

Normally the removal of existing stormwater eleemtns during construction increases the surface flow volumes and velocities on a site. This can then increase movement of debris silt and scouring of water channels.

DRAINS software was used to generate runoff modelling that represents the existing and post development stormwater conditions. A summary of peak flows is shown below.

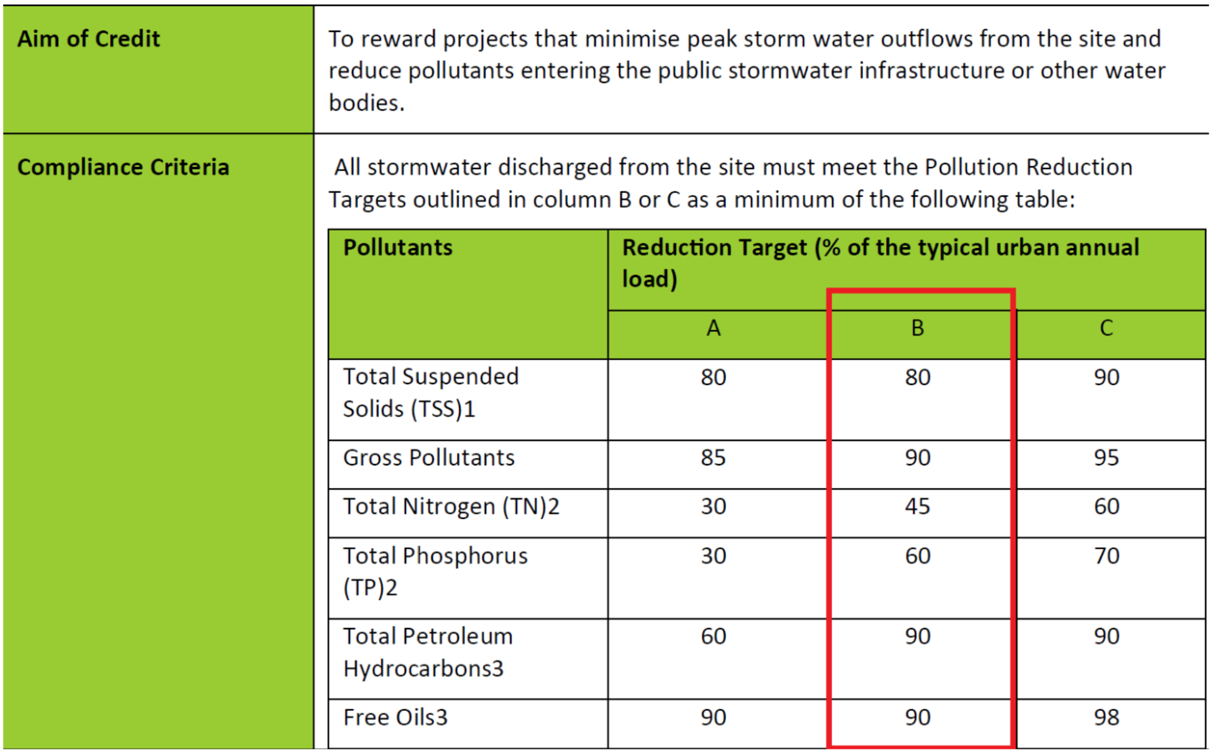
As the site discharge in located in stage 2 this is advantageous. There should be no significant change to the site runoff during construction as the envelope of the buildings being demolished in stage 1 is comparatively small. The intent is to maintain the existing stormwater pipe discharge from the site for the majority of the buildings (which are in the stage 2 envelope) while the stage 1 works are constructed. As part of the stage 1 works a new stormwater discharge is to be constructed and a stage 1 infiltration system. Based on storm events up to the 50 year storm the infiltration tank will not overflow to the new connection. As such we consider stormwater quantity to be reduced post construction and during construction.

5.2 STORMWATER QUALITY

Bulk earth works, vegetation clearing activities during construction phases, if not managed adequately, can lead to increased soil displacement. This element is considered adequately managed in the Sediment and Erosion Control Plan and relevant details.

The post construction stormwater quality runoff for the relevant catchments are required to meed requirements for Council compliance and for GreenStar Compliance.

The construction is proposing to meet a 2 point targer under Credit 26 Stormwater for this project which places the pollution reduction target as per Colum B shown below.



Aim of Credit	To reward projects that minimise peak storm water outflows from the site and reduce pollutants entering the public stormwater infrastructure or other water bodies.
Compliance Criteria	All stormwater discharged from the site must meet the Pollution Reduction Targets outlined in column B or C as a minimum of the following table:

Pollutants	**Reduction Target (% of the typical urban annual load)**		
	A	B	C
Total Suspended Solids (TSS)1	80	80	90
Gross Pollutants	85	90	95
Total Nitrogen (TN)2	30	45	60
Total Phosphorus (TP)2	30	60	70
Total Petroleum Hydrocarbons3	60	90	90
Free Oils3	90	90	98

5.3 FLOODING

Construction works can sometimes generate additional site runoff contributing to flooding of adjacent or downstream sites during significant rainfall events or in the absence of relevant flood protection measures such as temporary water containment.

This has been provided for this site using the two infiltration tanks. As such the construction stormwater runoff will be less than the current site runoff.

The site flood level is RL 2.65m for the 100 year ARI storm event which places the site above this level meaning the site material stockpile locations will be safe from significant migration during this event.

5.4 WET WEATHER EVENT MANAGEMENT

As noted above the site is unaffected by flooding up to the 100 year even based on the site levels. This will be further safe guarded by the raised site levels as per the approval.

There is a risk during large rain events that water runoff will result in sediment washing off site and or damage to the sediment and erosion control systems in place.

The following mitigation measures will be implemented for the following scenarios

General Management

- forecast for heavy rain and make decisions on the following accordingly.
- storage of hazardous materials and equipment away from flow paths and known drainage channel
- layout of site compound facilities to take into consideration of the flow paths which are shown on the sediment and erosion control plans and the civil drawings.
- ensure evacuation routes are kept clear during high risk periods based on weather and storm forecasts.
- ensure loose materials, fuel, chemicals and equipment can either be secured or removed during a flood event if required
- equipment shall be covered as required if runoff from equipment can be hazardous or create sediment or oil displacement.

1-year ARI

- Brief personnel at prestart
- Review of all current ERSED controls and ensure ESCP is still current
- Stormwater would be managed using the following controls
    - o Sediment fencing
    - o Diversion bunds / swales
    - o Coir logs/ sandbags/ silt socks

- Upstream stormwater runoff is expected to bypass the site using the swale system proposed. Other runoff will be minimum given the moderate infiltration rate and be handled by the ESCP.

5 Year ARI

- Implement as above for the 1-year ARI event
- Ensure all plant and equipment are removed from areas of concentrated flow
- Sedimentation basins maximum capacities will be maintained where practically possible

100 Year ARI

- Implement as above for the 1-year ARI event
- Remove all plant and equipment from site areas where there is potential for inundation
- Perimeter controls are not expected to be breached.
- Flow will be directed to the street for the existing buildings in placeprior to commencement of the stage 2 works. There will always be a site connection to the street for site water to be drained based on the stage 1 system or the existing system which is to remain prior to commencement of stage 2 works.

6 CONSTRUCTION IMPACTS

6.1 EROSION CONTROL

Erosion control is primary to a erosion and sediment control strategy. This can be achieved through:

- Limiting the area of disturbance and only disturbing what is required. Also limiting the time period of disturbance.
- Integrating elements that reduce or control the volume of water moving over surfaces. This includes, diversion through swales and table drains, and piped or lined channels to stabilised outlets.
- Measures the slow the velocity of water over exposed surfaces within the construction area such as hay bail barriers, introducing roughness, flow check measures, textiles, binding compounds or exposed surface protections. Binding products and surface protection can be spray on stabilisers, mulches, blankets, temporary vegetation and permanent progressive landscape construction.

The above is achieved using the correct implementation of the Erosion and Sediment Control Plan shown on the engineering drawings and any other recommendations in this report.

To achieve the requirements of not concentrating water flows which can lead to transportation of sediment off site it is recommended the swales on the stormwater design drawings be constructed as soon as practicable to divert upstream water around the site.

6.2 SEDIMENT MANAGEMENT

This is secondary to erosion control in minimising water pollution as a result of construction. Where required sediment basins are generally located at the low points of site discharges.

Requirements for sediment control basins are in accordance with Section 6.3.2.d of the Managing Urban Stormwater: Soils and Construction (the Blue Book). The soil loss from the catchment is led than that required for a sediment basin and as such one is not required.

6.3 STOCKPILE STABILISATION

As there is significant volumes of fill being proposed for the site it is foreseeable that material stockpiles will be required unless can be demonstrated as other by the Builder Taylor Constructions. Stockpiles within the site which will be in effect for more than 10 days should be stabalised. As per the Erosion and Sediment Control Plan all stockpiles are to have sediment fences on the downstream slopes and generally should be located a minimum of 5m from overland flow swales. If unused for 10 days then stockpiles shall also be stabalised in accordance with the below relative to the relevant material in the stockpile:

- Coarse grained stockpiles
  - Downstream perimeter rock armouring.
- Less coarse grained stockpiles
  - Polymer binder application
  - Application of hydro-seed or hydromulch.

6.4 HAZARDOUS MATERIALS

Hazardous material can often be transported to the site for construction purposes or from the site in the form of asbestos removal during demolition works. This will be addressed in accordance with the Construction Waste Management Sub-Plan (CWMSP) condition B16 prepared by others.

6.5 MANAGEMENT MEASURES

6.5.1 Topsoil management

As part of works topsoil is to be stripped and stockpiled for use later in the project. Stopsoil stockpiles shall be treated as per the requirements of stockpiles noted above.

6.5.2 Wind Erosion Management

At a minimum, exposed areas will be watered regularly to minimise dust and water carts to be readily available as this is an ongoing process. Additional watering may be required on windy days.

6.5.3 Site Drainage

As noted above, the swales are to be constructed as soon as practicable and treated in accordance with the above. This will prevent external catchment runoff penetrating the site. A bentonite impregnated geotextile liner will be used (Bentofix or equivalent) in unsealed sections of the working areas. This will form a suitable barrier to prevent contaminants from working areas entering the ground water or contaminating the soil of the site.

6.5.4 Revegetation Earthworks

Areas where earthworks have been completed are to be stabalised within ten days in accordance with the above recommendations. All erosion and sediment control are to remain inplace until stabilisation or revegetation is established. All stabalised areas are to be free of vehicle traffic to prevent disturbance.

Stabalisation of earthworks include, but are not limited to the following:

- Mulch covers
- Latex tape sprays
- Bitumen emulsion sprays
- Tarp cover
- Grass seeding

For areas stabalised with seeding, regular watering is required until an effective ground cover has been established. Re-seeding may be required in areas if inadequate coverage.

6.5.5 Maintenance Controls

Erosion and sediment control measures should be inspected and maintained regularly, generally daily and within 24 hours of each rainfall event. The site supervisor should be responsible for this to be undertaken. It is recommended the daily inspection be recorded including the following relevant information:

- Condition of each element noted on the Erosion and Sediment Control Plan
- Any maintenance requirements of each element
- Volume of sediment removed and if the location of the element is appropriate. Disposal method of site trapped sediment.
- Condition of site entry and gravel rip/rap
- Condition of stockpile protection if relevant
- Site stormwater disposal location conditions
- Drains checked to ensure adequate site runoff and for signs of erosion
- Any sediment erosion control linings
- Condition of revegetation works if relevant.

It is recommended these are sent to the Superintendent weekly.

6.5.6 Auditing

Auditing of the above and importing of soil material and controlled fill shall be monitored and tracked in accordance with the CEMP condition B13 of the CoC.

6.5.7 Responsibility

The Contractor is deemed to have the following responsibilities in relation to Soil and Water Management of this site:

- To ensure all works noted above are undertaken as instructed and generally in accordance with the Blue Book (Managing Urban Stormwater – Soils and Construction, Landcom 2004.
- All sub-contractors are made aware of their responsibilities in this area and made accountable.
- Checks are completed in accordance with the above Maintenance Controls (6.5.5)

7 REFERENCES

Geotechncial report by Cardno reference 5017190151 dated 23 January 2019

Schematic Design Report – Civil prepared by Birzulis Associates Pty Ltd dated 24 June 2020 revision C

Rockdale LEP 2011 – Part 6.1 Acid sulphate soils

Rockdale DCP 2011

Landcom (2004) Managing Urban Stormwater: Soils and Construction known as the Blue Book

Acid Sulfate Soils Management Plan prepared by Cardno reference 80818157 dated 23 January 2019.

8 APPENDIX A – Acid Sulfate Soil Management Plan

4 Acid Sulfate Soil Management Strategy

The following sections detail the management strategy for ASS on the project, and management measures to be applied in the event that ASS is disturbed. The management measures will apply to disturbance of natural soils at depths of 7 mBGL and greater. Precautionary measures including inspection should be undertaken for any disturbance of soils at and below the water table (nominally 3.8 to 3.9 mBGL) if required.

All earthworks, ASS treatment and stockpiling of soil must be undertaken in accordance with the project environmental controls and management plans. The Contractor is required to review the applicable plans and satisfy themselves that works on the site conform to requirements detailed in all applicable documents including this ASSMP.

Cardno has evaluated various options for the management of ASS on the site during construction works. These are discussed in subsequent sections.

4.1 Avoidance Strategies

During detailed design of the project, opportunities to reduce the disturbance of ASS on site have been identified. The avoidance of disturbing ASS beneath the Site has been selected as the primary mitigation measure for the project. In general, relatively limited disturbance of natural soils will be required, and works with the exception of piling for the main building foundation are currently proposed to occur above the water table, and not disturb ASS.

4.2 Minimisation of Disturbance

The likelihood and duration of disturbance should be minimised through detailed project planning. In general, efforts should be made to:

- Reduce the amount of ASS disturbed during the project;
- If ASS is to be disturbed, minimise the duration untreated soil is stockpiled; and
- Reduce the duration soil surfaces (including excavations) are left exposed.

Cardno has been advised that in accordance with the project mitigation strategy of disturbance avoidance that Screw / Helical Piles have been selected as an appropriate piling method for the building foundation piles which will require penetration of the ASS. This method removes the need for the exposure and potential oxidation of ASS by eliminating spoil return from pile borings. Should other methods of piling be required due to design or construction constraints, the contingency measures below should be employed.

4.3 Excavation Inspection

During excavations into natural soils that encounter the water table or depths of 7 mBGL inspection of excavated spoil should be undertaken by a suitably trained person for indictors of ASS. These excavations may include building footings, water tank installation pits, and infiltration system pits. If indicators such as sulphurous odours, organic matter, mottling or staining are observed, a suitably qualified environmental scientist should be engaged to undertake confirmation sampling for the presence of ASS as required. If ASS is identified, the contingency protocols in the sections below will be implemented.

5 Contingency Protocols

The following section details the contingency protocols for management measures in the event that works on site require excavation and treatment of ASS and/or groundwater interference or dewatering.

5.1 Excavated Soils

If soils identified as PASS are to be treated promptly following excavation (refer to **Section 5.1.4** for maximum stockpiling durations). Treatment should be achieved through the addition of the prescribed quantity of lime to the soil followed by mechanical mixing to ensure the lime is evenly mixed through the soil. Mechanical mixing of soils can be undertaken using earthmoving equipment, pug-mills or similar.

A review of analytical results obtained from the soil investigation programs undertaken on the site (Cardno 2019a) showed S_{CR} concentrations ranged from 0.05 to 0.35 %S. This ASSMP has taken a conservative approach and based the liming or neutralisation rate on the highest S_{CR} concentration (0.35 %S). The liming dosing rate for this project has been calculated in general accordance with the guidance contained within the ASSMAC Guideline (Stone et al., 1998).

Specifically, the lime dosing rate calculation incorporates:

- Sulfur concentrations as Net Acidity;
- An Effective Neutralising Value (ENV) of 1 (pure, finely ground lime with a particle size <0.3mm); and
- A safety factor of 1.5.

The liming rate for excavated PASS on site is 8.8 kg of lime per tonne of soil. Note for geotechnical purposes to improve the physical properties of the soil a higher liming rate may be required, if so designated by the Geotechnical Engineer.

If an alternative neutralising media is selected (i.e. using crushed limestone or other low ENV coarse granular material) a re-calculation of the neutralisation equation should be undertaken and the liming rate adjusted accordingly.

5.1.1 Excavation Surface

If excavated surfaces are to remain exposed, these exposed surfaces should also be applied with the lime at the rate specified in **Section 5.1**. To minimise further disturbance of Potential Acid Sulfate Soils below the final excavation level, the lime should be mixed into the upper 100mm of residual soil, then validated against the performance criteria specified in **Section 5.1.2**.

5.1.2 Soil Treatment Performance Criteria

The following performance criteria should be met to confirm effective neutralisation of soils:

- The neutralising capacity of the treated soil must exceed the existing plus potential acidity of the soil (e.g. pH_{FOX} must be > 5);
- The neutralising material has been thoroughly mixed with the soil pH must be in the range 6.0 to 8.5;
- Excess neutralising agent must remain within the soil until all acid generation reactions are complete and the soil has no further capacity to generate acidity.

If the performance criteria above are not met, additional rounds of lime treatment should be undertaken until the criteria are satisfied.

5.1.3 Validation Testing

Following lime treatment of excavated soils, soil validation sampling is required to confirm the effectiveness of the treatment. Stockpile samples should be collected at the rate specified in Table 1 of the ENM Order (NSW EPA, 2014) and analysed for pH_F and pH_{FOX}.

For the purpose of assessing the QA/QC performance of the soil validation testing program 5% of samples (1 in 20) should be submitted for acid – base accounting at a laboratory NATA accredited for such analysis.

5.1.4 Stockpiling Durations

Where ASS are to be treated and re-used on site, short term stockpiling is permissible. The maximum stockpiling durations for untreated soils are summarised in **Table 5-1**.

Table 5-1 Maximum ASS Stockpiling Duration

Material Type	Approximate Clay Content (%)	Maximum Duration of Stockpiling
Coarse texture Sands to loamy sands	≤5	14 days
Medium texture Sandy loams to light clays	5-40	21 days
Pyritic peat	N/A	21 days
Fine texture Medium to heavy clays & silty clays	≥40	28 days

5.1.5 Soil Treatment Area

ASS treatment of stockpiled soils should be conducted on a purpose constructed treatment pad for the mechanical application of the neutralising agents and/or for short-term stockpiling of soils.

DER (2015) provides recommendations for the minimum construction requirements for Acid Sulfate Soils Treatment pads. The treatment pad may be constructed to either of the following general specifications:

- Constructed using an alkaline material, such as crushed limestone or lime-treated material with a minimum thickness of 300 mm and a 150 mm high bund around the edges. The pad should be compacted to minimise infiltration and be graded such that rainwater runoff is directed to a collection point within the pad.
- An impervious physical barrier such as a bunded concrete slab, compacted clay or layer of bitumen may be used as a treatment pad. In this case the base layer should be slightly domed or sloped to prevent leachate from pooling in the treatment pad, with a run-off collection drain constructed at the margins of the pad to manage run-off.

Treatment pads should be located on stable ground, away from overland flow paths and preferably in locations where bund and run-off / leachate collection pond construction does not disturb in situ ASS. Treatment pads should be set up to allow maximum treatment batch sizes of 500 m^3 at a time as it can be difficult to representatively sample larger batches, and re-treatment of large failed batches is expensive.

If earthworks are to be undertaken during a period where significant rainfall is expected the pad construction will also need to incorporate a lined sump area to enable collection of run-off for appropriate treatment. Run-off collected in this manner shall be directed to a dewatering effluent treatment area for assessment and treatment if necessary.

5.2 Groundwater Management

Groundwater monitoring results to date have indicated that groundwater at the site has of pH of between 6 and 7, which is considered representative of rainwater infiltration, however should disturbance of ASS on the project be required, it is recommended that further monitoring be conducted to monitor possible impacts.

Groundwater monitoring should be undertaken during construction or when dewatering, if there are sustained exceedance of the adopted surface water performance criteria and/or by visual evidence of impact (e.g. widespread jarosite mineralisation, stressed vegetation or impact to flora / fauna).

If required, groundwater monitoring would likely be conducted using the existing bore network, or with supplementary bores for the purposes of:

- Detection of groundwater impact potential resulting from the disturbance of ASS and/or dewatering;
- Assessment of up-gradient (background) groundwater quality;
- Estimation of groundwater flow direction.

If required, groundwater monitoring should include field gauging of groundwater water levels and physicochemical parameters (pH, redox potential, electrical conductivity, dissolved oxygen, temperature):

- Once a week during dewatering.
- Once approximately one month following completion of construction works.

Groundwater monitoring with collection of samples for analytical testing should be conducted in accordance with methodologies outlined in AS NZS 5667.11 - 1998 *Water Quality - Sampling Part 11 Guidance on Sampling of Groundwaters*.

Groundwater samples should be analysed for pH, electrical conductivity, heavy metals, nutrients and anions and cations. If groundwater monitoring shows deterioration in groundwater quality additional monitoring should be undertaken.

5.3 Additional Contingencies

5.3.1 Weather Events

It is the responsibility of the Principal Civil Contractor (PCC) to take precautions in response to environmental conditions or adverse weather events. The principal weather related risk for this project is likely to be heavy rainfall events, given the project location. The PCC should prepare procedures that detail the proposed responses to forecast heavy rainfall events. These procedures should consider the risks posed by flooding of the work site, stockpiling locations and the ASS treatment areas.

5.3.2 Over Liming

Where lime treatment of the soil results in overshooting of the upper pH performance criteria (pH 8.5), the PCC should segregate this soil from other soils on the site. The advice of an environmental professional should be sought in relation to potential management / disposal options, having consideration for the alkalinity of the soil, and the potential for the discharge of alkaline water as run-off.

Potential disposal options include:

- Blending of the soil with other untreated ASS materials;
- Deep burial of the soil; and
- Disposal of the soil to landfill.

5.3.3 Offsite Disposal of Soil

Where offsite disposal of treated ASS is required, this material should be classified in accordance with the NSW EPA (2014) *Waste Classification Guidelines*. Due to the presence of Acid Sulfate Soils, *Part 4: Acid Sulfate Soils* of the NSW EPA (2014) *Waste Classification Guidelines* will apply to natural soils at depth identified as PASS, which details timing for excavation and disposal requirements as well as the licensing requirements for landfills accepting the soil.

9 Appendix B – CV of Engineer

CAMERON AMRI
SENIOR CIVIL & STRUCTURAL ENGINEER

Bachelor of Engineering in Civil Engineering
University of Technology Sydney

Professional memberships

Member of the Institution of Engineers, Australia
Chartered Professional Engineer (CPEng)
Registered on the National Engineering Register (NER)
Registered Professional Engineer of Queensland

Experience
Since completing his degree in 2007, Cameron has worked as a civil structural engineer for MLH, Kneebone & Beretta, E2 Design and for Birzulis Associates Pty Ltd.

A selection of projects Cameron has been involved in:

Aged Care
- HammondGrove, Hammondville
- Scalabrini Village Bexley
- Scalabrini Village Drummoyne
- Scalabrini Village Austral
- Scalabrini Village Chipping Norton
- Scalabrini Village Griffith
- Scalabrini Village Yoogali

Religious
- Our Lady of Mount Carmel
- Catholic Parish of Mary Immaculate

Education
- Thomas Reddall High School
- Westmead Public School
- Springwood High School
- Chifley Campus
- Parramatta West Public School
- Blacktown Tafe
- Wiley Park Girls High School
- Chester Hill High School
- Doonside High School
- Westfield Sports High
- Ingleburn High School
- Wenona School, North Sydney
- Granville Public School
- Bellevue Hill Public School
- Riverstone High School
- Mount Annan Public School
- Matthew Pearce Primary School
- Mount Druitt Tafe
- NirimbaTafe

10 Appendix C – Evidence of Consultation with Council

Post Approval – Consultation

Consultation needs to be meaningful, done with courtesy and respect and be well documented. These are people/ organisations that we need to be building meaningful relationships with.

Conditions of all consent can require consultation with a range of stakeholders. Consultation in the post approval world needs to be well documented to satisfy the condition requirements.

Examples include Council, service providers (eg. Electricity gas etc.), consult with local bus provider and TfNSW.

Read each condition carefully, any reference to consult triggers consultation.

Typically on State Significant Development, there will be a specific consultation condition as to how this piece can be appropriately addressed.

Consultation is not:

- A token gesture
- Done at the end of the piece of work,
- An email to the relevant stakeholder with no response;
- A meeting with the stakeholder with no meeting minutes.

Consultation is:

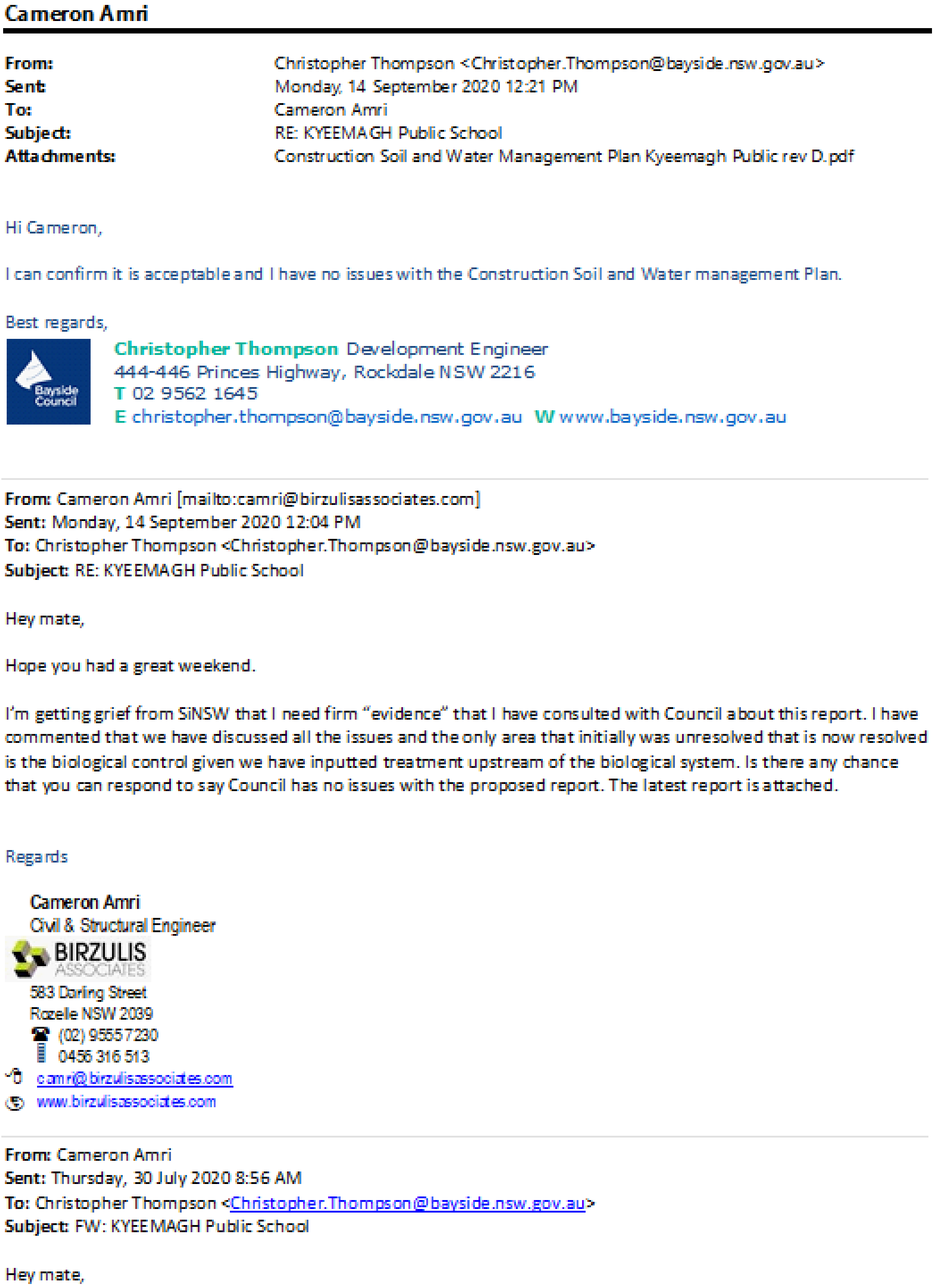
- Meaningful
- Done prior to the requirement,
- Captures an outcome,
- Identifies matters resolved,
- Identifies matters unresolved,
- Any disagreements are disclosed; and
- How we are going to address unresolved matters?

How to capture all the relevant details on consultation requirements? Any consultation requirement in a condition is required to be accompanied with the following table:

Post Approval Consultation Record

Identified Party to Consult:	Bayside Council
Consultation type:	Phone and email correspondence
When is consultation required?	During the Design phase, prior to construction
Why	Condition Number B17 and Condition requiring consultation with Council requiring the report be prepared in Consultation with Council.
When was consultation scheduled/held	Phone conversation with 2 July 2020 and email correspondence. Email correspondence on 2 July 2020. Email correspondence on 3 July 2020. Email on 7 July 2020. Phone discussion 30 July 2020 Email 5 August 2020 Email on 3 September 2020
When was consultation held	As per the above.
Identify persons and positions who were involved	Christopher Thompson from Bayside Council
Provide the details of the consultation	Phone conversation with the above and the author of this report 2 July 2020 and email discussing the project. Introduction to the type of project and the overall civil design intent. Specifically, the biological control and the infiltration system proposed and Construction Soil and Water Management Plan. Email correspondence on 2 July 2020 with the above and the author of this report sending copy of the civil drawings to Bayside Council including DRAINS file. Email correspondence on 3 July 2020 with the above and the author of this report discussing infiltration system maintenance requirements and access to provide maintenance to infiltration system. Email on 7 July 2020 with the above and the author of this report sending copy of the first version of this report to Council as required under the requirements of Consulting with Council. Phone discussion with Christopher Thompson discussing the Construction Soil and Water Management Plan draft that was sent for Council response and the biological controls. It was agreed that we would provide biological control upstream of the infiltration system and there were no stipulations from Council regarding the Construction Soil and Water Management Plan.
What specific matters were discussed?	Biological control, Construction Soil and Water Management Plan, infiltration system types and maintenance, and software modelling.
What matters were resolved?	Infiltration system specific product was approved.
What matters are unresolved?	On phone conversation today Birzuils has agreed to provide biological control upstream of infiltration system. Please note this is not related to Construction Soil and Water Management Plan. There are no unresolved matters regarding this report. We had to comment on the biological control as it comes up as unresolved in the attached email correspondence. We have verbal confirmation with Christopher Thompson from Bayside Council there are no unresolved matters pertaining to this report. We have agreed to continue consulting regarding the stormwater biological control.

Any remaining points of disagreement?	Nil regarding this report’s scope.
How will SINSW address matters not resolved?	There are no matters unresolved for this report.



Cameron Amri

From: Christopher Thompson <Christopher.Thompson@bayside.nsw.gov.au>
Sent: Monday, 14 September 2020 12:21 PM
To: Cameron Amri
Subject: RE: KYEEMAGH Public School
Attachments: Construction Soil and Water Management Plan Kyeemagh Public rev D.pdf

Hi Cameron,

I can confirm it is acceptable and I have no issues with the Construction Soil and Water management Plan.

Best regards,

Bayside Council
Christopher Thompson Development Engineer
444-446 Princes Highway, Rockdale NSW 2216
T 02 9562 1645
E christopher.thompson@bayside.nsw.gov.au W www.bayside.nsw.gov.au

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From: Cameron Amri [mailto:camri@birzulisassociates.com]
Sent: Monday, 14 September 2020 12:04 PM
To: Christopher Thompson <Christopher.Thompson@bayside.nsw.gov.au>
Subject: RE: KYEEMAGH Public School

Hey mate,

Hope you had a great weekend.

I'm getting grief from SiNSW that I need firm "evidence" that I have consulted with Council about this report. I have commented that we have discussed all the issues and the only area that initially was unresolved that is now resolved is the biological control given we have inputted treatment upstream of the biological system. Is there any chance that you can respond to say Council has no issues with the proposed report. The latest report is attached.

Regards

Cameron Amri
Civil & Structural Engineer
BIRZULIS ASSOCIATES
583 Darling Street
Rozelle NSW 2039
☎ (02) 9555 7230
0456 316 513
camri@birzulisassociates.com
www.birzulisassociates.com

From: Cameron Amri
Sent: Thursday, 30 July 2020 8:56 AM
To: Christopher Thompson <Christopher.Thompson@bayside.nsw.gov.au>
Subject: FW: KYEEMAGH Public School

Hey mate,

Hope you are having a great week. Any comment on this report. Is Council happy with it?

Regards

Cameron Amri
Civil & Structural Engineer
583 Darling Street
Rozelle NSW 2039
☎ (02) 9555 7230
📱 0456 316 513
camri@birzulisassociates.com
www.birzulisassociates.com

From: Cameron Amri
Sent: Tuesday, 7 July 2020 12:35 PM
To: Christopher Thompson <Christopher.Thompson@bayside.nsw.gov.au>
Subject: RE: KYEEMAGH Public School

Hello again,

Hope you are having a great week. I'm required by the State Significant Development CoC to "consult with Council" regarding this report. Attached is the draft report.

I think the report will help to understand our argument that there is no significant need to treat water as part of biological control as the site is not an industrial site with a chemical operational cycle but I think we can add some for of treatment system for the car park water which would be good to filter prior to the infiltration system. I'm happy to update the plans to reflect that. 😊

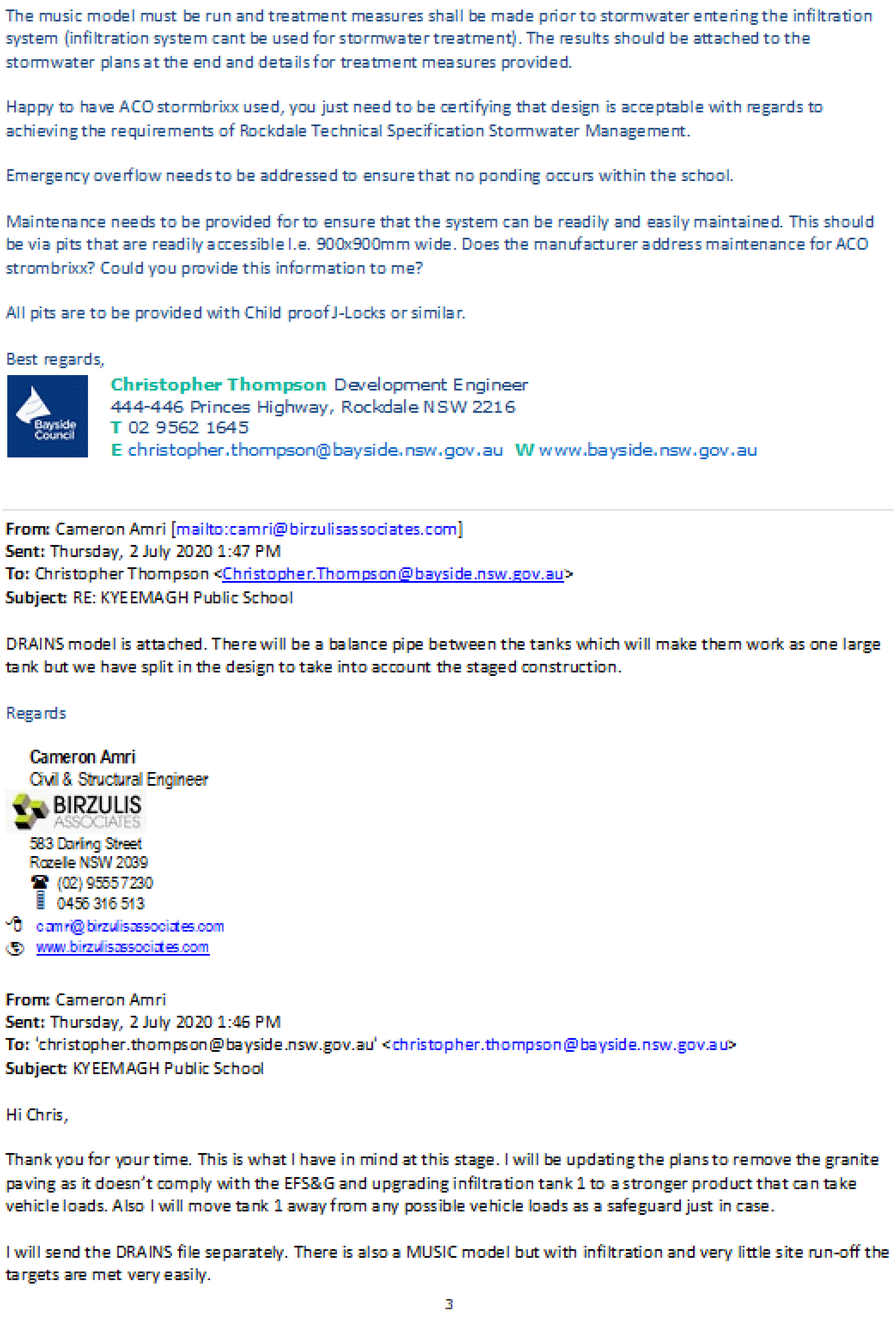
Regards

Cameron Amri
Civil & Structural Engineer
583 Darling Street
Rozelle NSW 2039
☎ (02) 9555 7230
📱 0456 316 513
camri@birzulisassociates.com
www.birzulisassociates.com

From: Christopher Thompson <Christopher.Thompson@bayside.nsw.gov.au>
Sent: Friday, 3 July 2020 11:33 AM
To: Cameron Amri <camri@birzulisassociates.com>
Subject: RE: KYEEMAGH Public School

Hi Cameron,

I could not review the drains file for some reason. Anyway I have attached the calculation spreadsheet we have on file for your review.



The music model must be run and treatment measures shall be made prior to stormwater entering the infiltration system (infiltration system cant be used for stormwater treatment). The results should be attached to the stormwater plans at the end and details for treatment measures provided.

Happy to have ACO stormbrixx used, you just need to be certifying that design is acceptable with regards to achieving the requirements of Rockdale Technical Specification Stormwater Management.

Emergency overflow needs to be addressed to ensure that no ponding occurs within the school.

Maintenance needs to be provided for to ensure that the system can be readily and easily maintained. This should be via pits that are readily accessible I.e. 900x900mm wide. Does the manufacturer address maintenance for ACO strombrixx? Could you provide this information to me?

All pits are to be provided with Child proof J-Locks or similar.

Best regards,

Christopher Thompson Development Engineer
444-446 Princes Highway, Rockdale NSW 2216
T 02 9562 1645
E christopher.thompson@bayside.nsw.gov.au W www.bayside.nsw.gov.au

---

From: Cameron Amri [mailto:camri@birzulisassociates.com]
Sent: Thursday, 2 July 2020 1:47 PM
To: Christopher Thompson <Christopher.Thompson@bayside.nsw.gov.au>
Subject: RE: KYEEMAGH Public School

DRAINS model is attached. There will be a balance pipe between the tanks which will make them work as one large tank but we have split in the design to take into account the staged construction.

Regards

Cameron Amri
Civil & Structural Engineer
583 Darling Street
Rozelle NSW 2039
☎ (02) 9555 7230
0456 316 513
camri@birzulisassociates.com
www.birzulisassociates.com

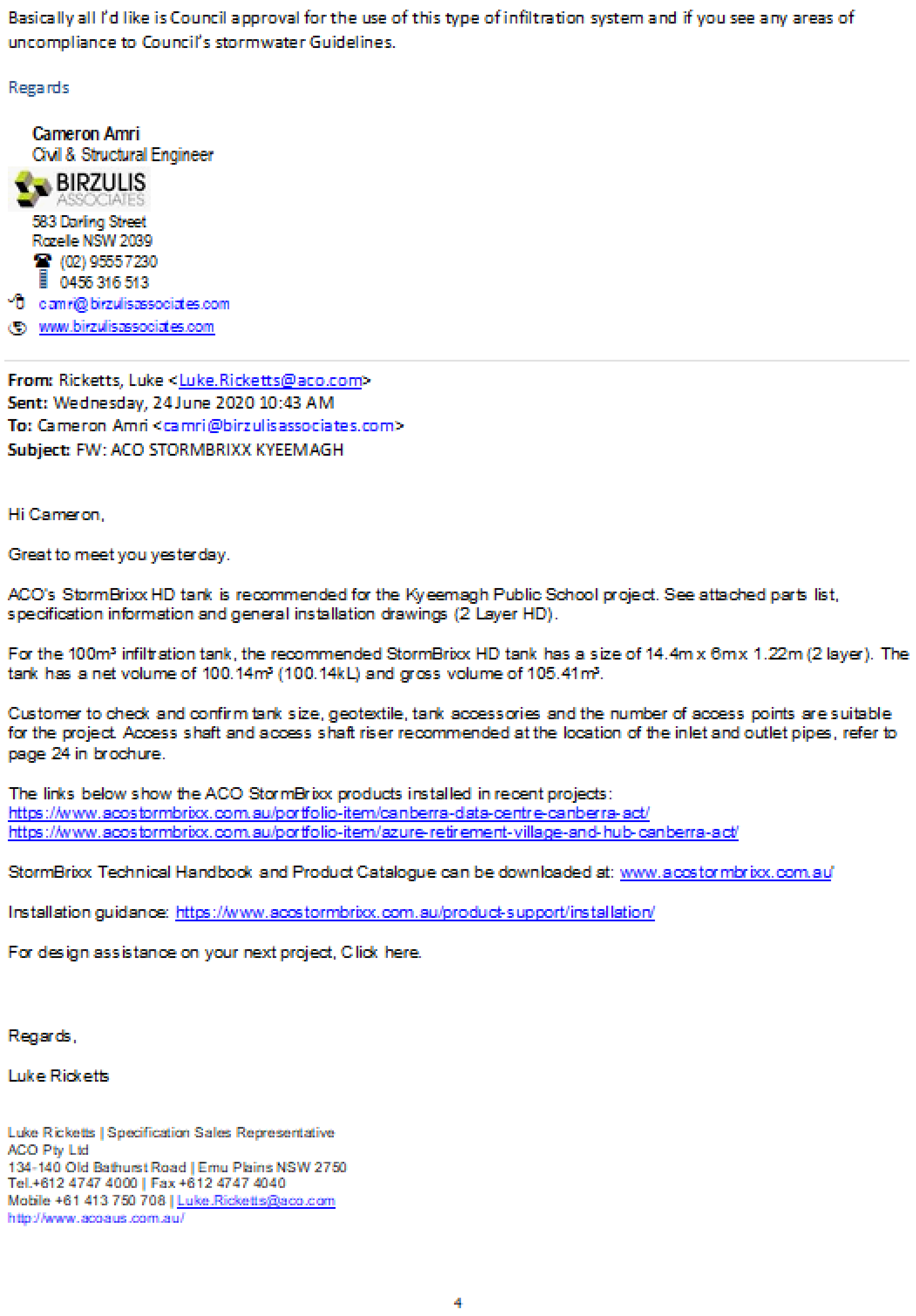
From: Cameron Amri
Sent: Thursday, 2 July 2020 1:46 PM
To: 'christopher.thompson@bayside.nsw.gov.au' <christopher.thompson@bayside.nsw.gov.au>
Subject: KYEEMAGH Public School

Hi Chris,

Thank you for your time. This is what I have in mind at this stage. I will be updating the plans to remove the granite paving as it doesn't comply with the EFS&G and upgrading infiltration tank 1 to a stronger product that can take vehicle loads. Also I will move tank 1 away from any possible vehicle loads as a safeguard just in case.

I will send the DRAINS file separately. There is also a MUSIC model but with infiltration and very little site run-off the targets are met very easily.

3



Basically all I'd like is Council approval for the use of this type of infiltration system and if you see any areas of uncompliance to Council's stormwater Guidelines.

Regards

Cameron Amri
Civil & Structural Engineer
BIRZULIS
ASSOCIATES
583 Darling Street
Rozelle NSW 2039
☎ (02) 9555 7230
0456 316 513
camri@birzulisassociates.com
www.birzulisassociates.com

From: Ricketts, Luke <Luke.Ricketts@aco.com>
Sent: Wednesday, 24 June 2020 10:43 AM
To: Cameron Amri <camri@birzulisassociates.com>
Subject: FW: ACO STORMBRIXX KYEEMAGH

Hi Cameron,

Great to meet you yesterday.

ACO's StormBrixx HD tank is recommended for the Kyeemagh Public School project. See attached parts list, specification information and general installation drawings (2 Layer HD).

For the 100m³ infiltration tank, the recommended StormBrixx HD tank has a size of 14.4m x 6m x 1.22m (2 layer). The tank has a net volume of 100.14m³ (100.14kL) and gross volume of 105.41m³.

Customer to check and confirm tank size, geotextile, tank accessories and the number of access points are suitable for the project. Access shaft and access shaft riser recommended at the location of the inlet and outlet pipes, refer to page 24 in brochure.

The links below show the ACO StormBrixx products installed in recent projects:
https://www.acostormbrixx.com.au/portfolio-item/canberra-data-centre-canberra-act/
https://www.acostormbrixx.com.au/portfolio-item/azure-retirement-village-and-hub-canberra-act/

StormBrixx Technical Handbook and Product Catalogue can be downloaded at: www.acostormbrixx.com.au/

Installation guidance: https://www.acostormbrixx.com.au/product-support/installation/

For design assistance on your next project, Click here.

Regards,

Luke Ricketts

Luke Ricketts | Specification Sales Representative
ACO Pty Ltd
134-140 Old Bathurst Road | Emu Plains NSW 2750
Tel.+612 4747 4000 | Fax +612 4747 4040
Mobile +61 413 750 708 | Luke.Ricketts@aco.com
http://www.acoaus.com.au/

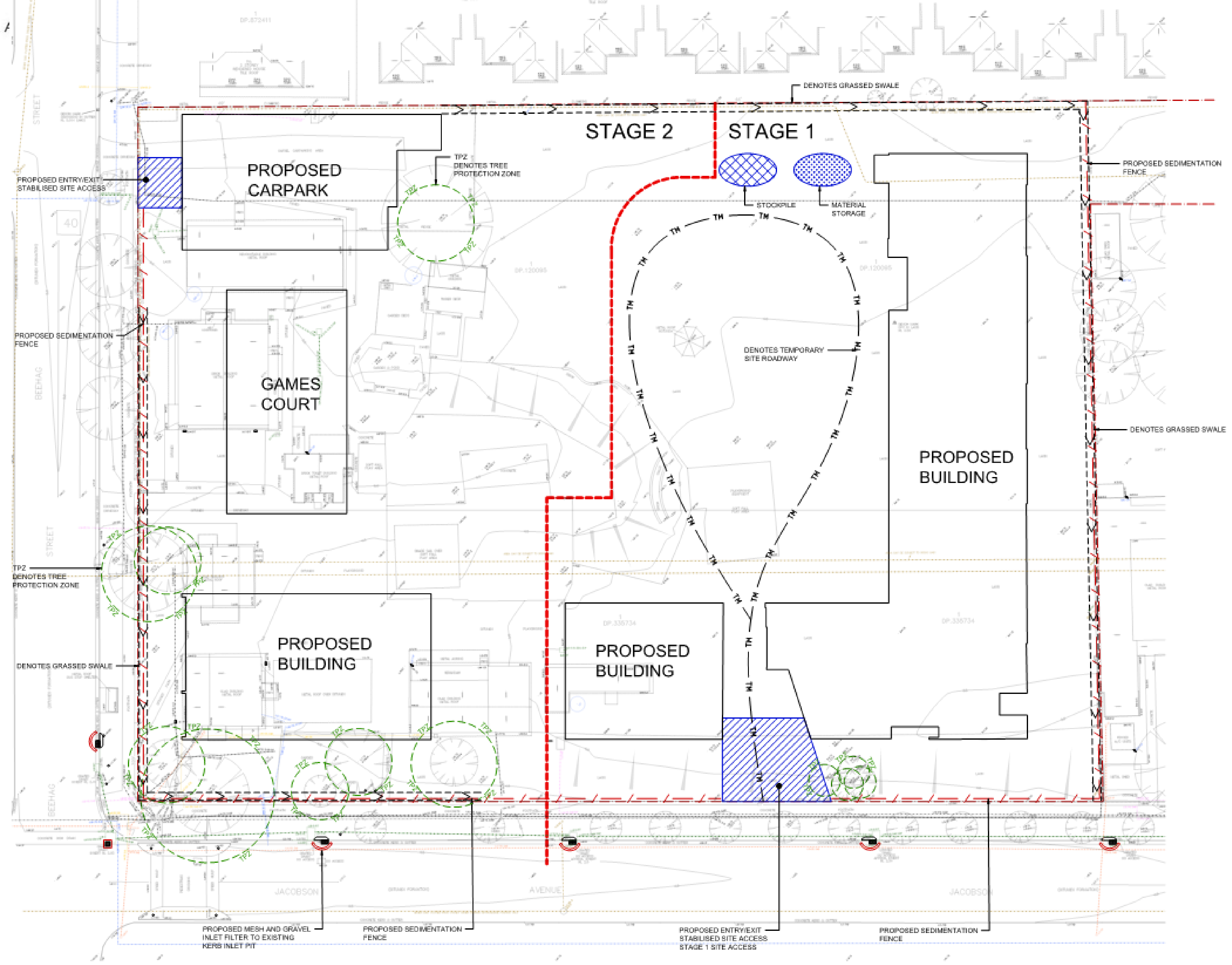
4

11 Appendix D – Erosion and Sediment Control design drawings

Drawings prepared by Birzulis Associates Pty Ltd. The latest version of each of these documents and this report should be used at all stages during the construction.

BIRZULIS ASSOCIATES Pty Ltd
Consulting Structural + Civil Engineers

Sydney Office
583 Darling Street, Rozelle NSW 2039
Telephone: 9555 7230
Email: office@birzulisassociates.com
Newcastle Office



SOIL EROSION AND SEDIMENT CONTROL PLAN
SCALE 1:250

GENERAL NOTES.

1. THIS PLAN IS A CONCEPT PLAN ONLY FOR STORMWATER DISPOSAL & EROSION CONTROL. IT IS NOT SUITABLE FOR CONSTRUCTION. THIS PLAN SHOULD BE ADAPTED BY THE BUILDER DURING DEMOLITION, EXCAVATION & CONSTRUCTION PHASES TO ENSURE ADEQUATE PERFORMANCE.
2. ALL DRAINAGE LAYOUT & DETAILS ARE DIAGRAMMATIC & INDICATIVE ONLY. ACTUAL LOCATION, SIZES, LEVELS & GRADES MAY LATER WHEN DETAIL DESIGN WORKS ARE DOCUMENTED.

EROSION & SEDIMENTATION CONTROL NOTES

1. CONTRACTOR SHALL PROVIDE SEDIMENT FENCING MATERIAL DURING CONSTRUCTION TO THE LOW SIDE OF THE WORKS. TIE SEDIMENT FENCING MATERIAL TO CYCLONE WIRE SECURITY FENCE. SEDIMENT CONTROL FABRIC SHALL BE AN APPROVED MATERIAL (EG. HUMES PROPEX SILT STOP) STANDING 300mm ABOVE GROUND & EXTENDING 150mm BELOW GROUND.
2. EXISTING DRAINS LOCATED WITHIN THE SITE SHALL ALSO BE ISOLATED BY SEDIMENT FENCING MATERIAL.
3. NO PARKING OR STOCKPILING OF MATERIAL IS PERMITTED ON THE LOWER SIDE OF THE SEDIMENT FENCE.
4. GRASS VERGES SHALL BE MAINTAINED AS MUCH AS PRACTICAL TO PROVIDE A BUFFER ZONE TO THE CONSTRUCTION SITE.
5. CONSTRUCTION ENTRY/EXIT SHALL BE VIA THE LOCATION NOTED ON THE DRAWING. CONTRACTOR SHALL ENSURE ALL DROPPABLE SOIL & SEDIMENT IS REMOVED PRIOR TO CONSTRUCTION TRAFFIC EXITING SITE. CONTRACTOR SHALL ENSURE ALL CONSTRUCTION TRAFFIC ENTERING & LEAVING THE SITE DO SO IN A FORWARD DIRECTION.

NOTE:
THIS PLAN IS TO READ IN CONJUNCTION WITH THE CONSTRUCTION SOIL AND WATER MANAGEMENT PLAN.

NOT FOR CONSTRUCTION

ISSUE	DESCRIPTION	APPROVED	DATE
2	AMENDMENT FOR REVISED PAVEMENT LEVELS	-	27-08-20
1	FOR CC1 APPROVAL	-	14-08-20
P3	SURVEY ADDED	-	28.07.20
P2	SCHEMATIC DESIGN ISSUE	-	25.06.20
P1	DRAFT SSR ISSUE	-	15.06.20

ARCHITECT
TAYLOR

BIRZULIS ASSOCIATES
CONSULTING STRUCTURAL & CIVIL ENGINEERS
583 DARLING STREET ROZELLE NSW 2039
tel: (02) 9555 7230 email : office@birzulisassociates.com
www.birzulisassociates.com

PROJECT
KYEEMAGH PUBLIC SHOOL
JACOBSON AVE, KYEEMAGH

TITLE
SOIL EROSION AND SEDIMENT CONTROL PLAN

SCALES		DATE	
1:250 @ A1		MAY 2020	
DRAWN	DESIGN	VERIFIED	APPROVED
JM	CA/MG	-	-

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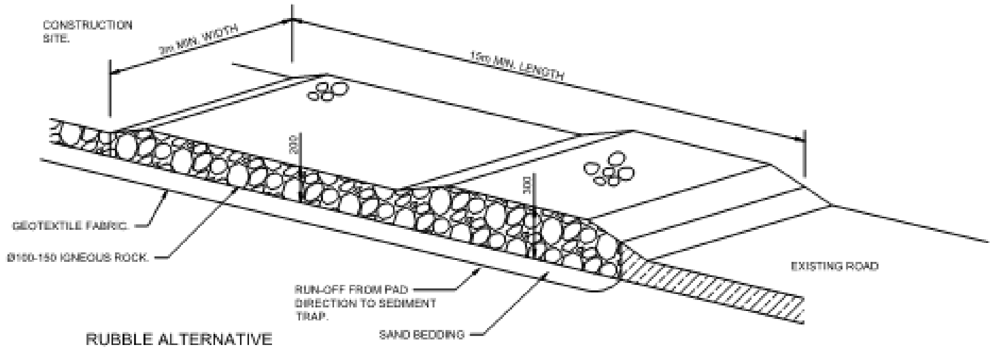
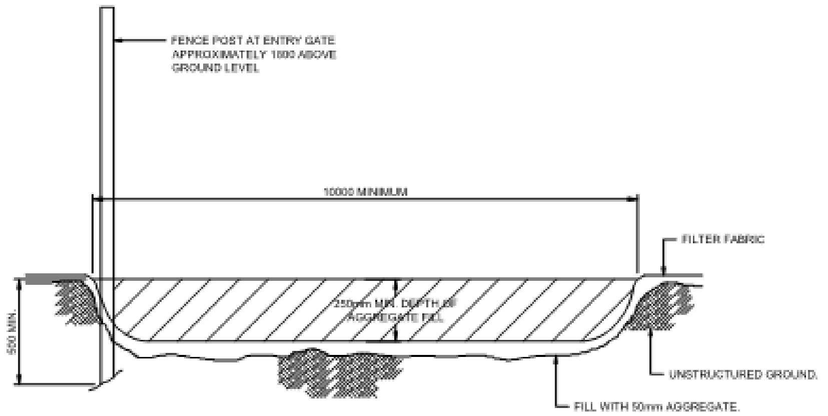
ISSUE	PROJECT No.	DRAWING No.
2	7863	C.100

DIRECTORS
B Fimmano B.E. (Hons), M.I.E. Aust., C.P.Eng.
M A Grogan B.E., M.Eng., M.I.E. Aust., C.P.Eng.
ASSOCIATE DIRECTOR
P W Grogan B.E. (Hons), M.E.(Struct), M.I.E. Aust., C.P.Eng.
CONSULTANT
A J Birzulis OAM, B.E., M.Eng. Sc., F.I.E. Aust., C.P.Eng.



TEMPORARY CONSTRUCTION EXIT

NOT TO SCALE



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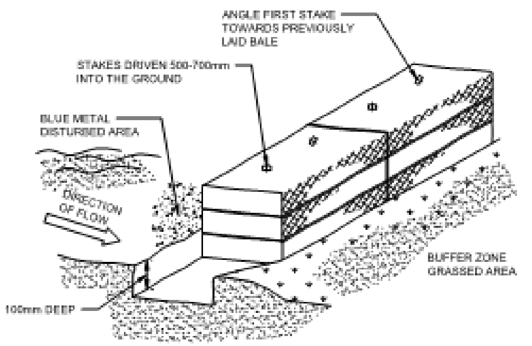

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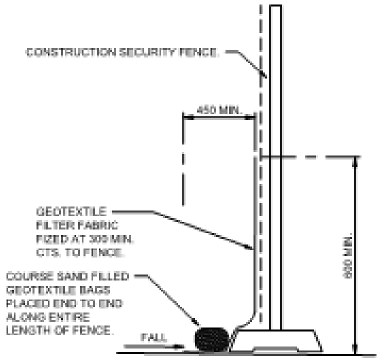
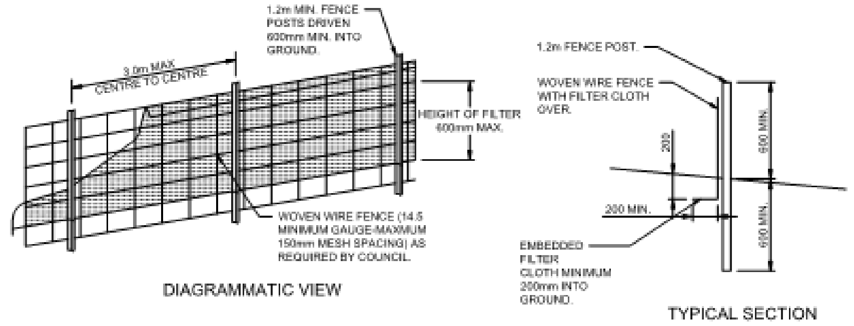


SEDIMENT FENCE ON PAVED SURFAC E

NOT TO SCALE



DIAGRAMMATIC VIEW

TYPICAL SECTION

SEDIMENT FENCE DETAIL

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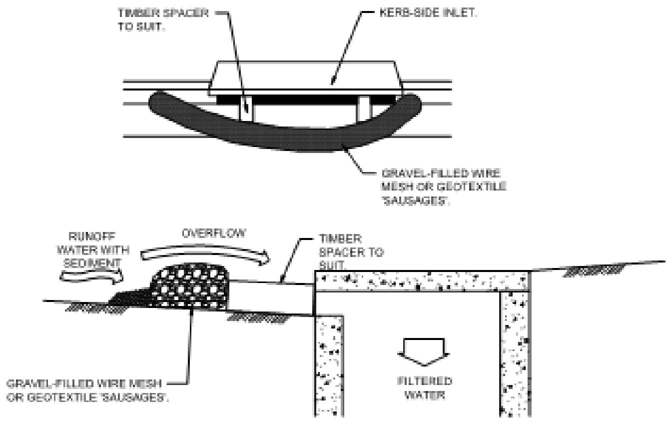
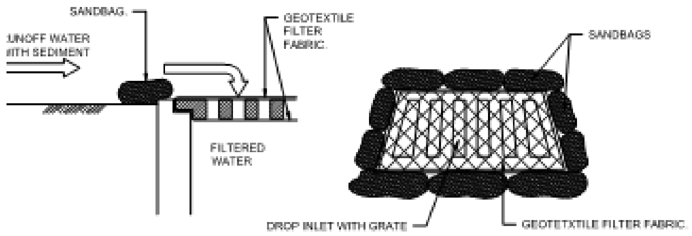


MESH AND GRAVEL INLET FILTER

SCALE 1:20

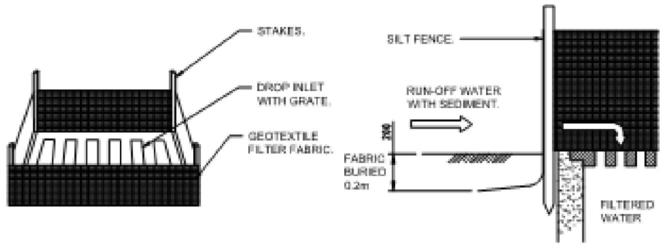
NOTES:

1. FABRICATE A SSLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm TO 50mm GRAVEL.
2. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH Ax 400mm WIDE.
3. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
4. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
5. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY CAN FIRMLY ABUT EACH OTHER AND SEDIMENT/LADEN WATERS CANNOT PASS BETWEEN.



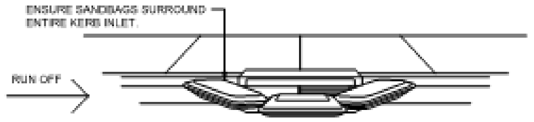
GEOTEXTILE FILTER FABRIC DROP INLET SEDIMENT TRAP

NOT TO SCALE



SUMP SEDIMENT TRAP DETAIL

NOT TO SCALE



SANDBAG KERB INLET SEDIMENT TRAP

NOT TO SCALE

NOT FOR CONSTRUCTION

ISSUE	DESCRIPTION	APPROVED	DATE
2	AMENDMENT FOR REVISED PAVEMENT LEVELS	-	21-08-20
1	FOR CC1 APPROVAL	-	10-06-20
P2	SCHEMATIC DESIGN ISSUE	-	25-05-20
P1	DRAFT STR ISSUE	-	15-05-20

ARCHITECT

TAYLOR

BIRZULIS ASSOCIATES
CONSULTING STRUCTURAL & CIVIL ENGINEERS
583 DARLING STREET ROZELLE NSW 2039
tel: (02) 9555 7230 email : office@birzulisassociates.com
www.birzulisassociates.com

PROJECT
KYEEMAGH PUBLIC SHOOL
JACOBSON AVE, KYEEMAGH

TITLE
TYPICAL DETAILS - SOIL EROSION AND SEDIMENT CONTROL

SCALES: N/A @ A1
DATE: MAY 2020
DRAWN: JM
DESIGN: CA/MG
VERIFIED: -
APPROVED: -

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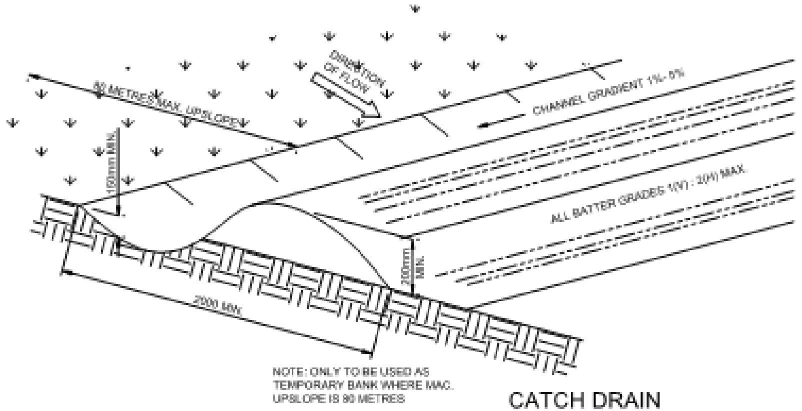
ISSUE: 2
PROJECT No.: 7863
DRAWING No.: C.30

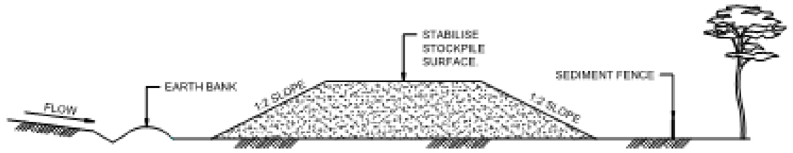


CATCH DRAIN

NOT TO SCALE

CATCH DRAIN CONSTRUCTION NOTES:

1. CONSTRUCT ALONG GRADIENT AS SPECIFIED.
2. MAXIMUM SPACING BETWEEN BANKS SHALL BE 80 METRES.
3. DRAINS TO BE OF PARABOLIC OR TRAPEZOIDAL CROSS SECTION NOT V-SHAPED.
4. EARTH BANKS TO BE ADEQUATELY COMPACTED IN ORDER TO PREVENT FAILURE.
5. CONSTRUCTION OF A TEMPORARY NATURE AND SHALL BE COMPACTED AT THE END A DAYS WORK OR IMMEDIATELY PRIOR RAIN.
6. ALL OUTLETS FROM DISTURBED LANDS ARE TO FEED INTO SEDIMENT BASIN OR SIMILAR.
7. DISCHARGE RUNOFF COLLECTED FROM UNDISTURBED LANDS ONTO EITHER A STABILISED OR AN UNDISTURBED DISPOSAL AISTE WITHIN THE SAME SUBCATCHMENT AREA FROM WHICH THE WATER ORIGINATED.
8. COMPACT WITH A SUITABLE IMPLEMENT IN SITUATIONS WHERE THEY ARE REQUIRED TO FUNCTION FOR MORE THAN 5 DAYS.
9. EARTH BANKS TO BE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT WILL IMPEDE NORMAL FLOW.



STOCKPILES DETAIL

NOT TO SCALE

APPENDIX 12: PROJECT REMEDIATION ACTION PLAN & ADDENDUM RAP

Remediation Action Plan

Kyeemagh Infants School, Corner of Jacobson Avenue and Beehag Street, Kyeemagh NSW

80818157

Prepared for
DWP Australia Pty Ltd

24 January 2019

Contact Information

Cardno (NSW/ACT) Pty Ltd
ABN 95 001 145 035

Level 9 - The Forum
203 Pacific Highway
St Leonards NSW 2065
Australia

www.cardno.com
Phone +61 2 9496 7700
Fax +61 2 9439 5170

Author(s):

Ben Withnall
Environmental Scientist

Approved By:

Robert Campbell
Senior Environmental Scientist

Document Information

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Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by
V1	23/01/2019	Draft for Internal Review	Ben Withnall	Robert Campbell
RevA	23/01/2019	Draft for Client Review	BW	RC
Rev0	24/01/2019	Final Report	BW	RC

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Executive Summary

Cardno (NSW/ACT) Pty Ltd (Cardno) was engaged by DWP Australia Pty Ltd (The Client) to prepare a Remediation Action Plan (RAP) to guide and inform the remediation of soils at Kyeemagh Infants School, corner of Jacobson Avenue and Beehag Street, Kyeemagh NSW. The Site is proposed to be redeveloped from its current configuration as an infants school into a K-6 capable primary school.

The Site is located on a parcel of land that has been in use as a school since 1942. The Detailed Site Investigation (DSI) conducted by Cardno in 2018/9 identified areas of Contaminants of Potential Concern (COPCs) within soils requiring remediation or management. The identified areas of concern were an area of asbestos impacted soils above the adopted NEPM Health Screening Level (HSL) in the east of the site, an area of nickel impacted topsoil above the site specific Ecological Investigation Level (EIL) in the northern area of the site, and an area of hydrocarbon fractions C_{16}-C_{34} impacted soil above the adopted NEPM Ecological Screening Level (ESL) beneath hardstand in the south west.

The objectives of the RAP are to define the soil remediation and validation requirements for the previously identified asbestos, nickel and hydrocarbon impacts at the Site. Additionally, the remedial strategies are designed to minimise the potential risks to human health and the environment relative to the proposed land use of the property as a primary school.

Cardno evaluated potentially applicable remedial alternatives to address the potential risks to human health and the environment. Due to the finalised design and business case for each option being pending at the time of this report, two remedial strategies are provided which will eliminate receptor pathways to the identified COPCs at the site. The recommended strategies involve a combination of off-site disposal of impacted soil, and on-site containment beneath hardstand. These strategies provide the most efficient option for remediating the site, taking advantage of soil removal required for construction purposes and the capping potential of hardstand for the new development.

The remedial strategies are to be performed jointly by an environmental consultant, occupational hygienist and a licensed contractor and will involve the following general steps:

Remediation Strategy 1:

1. Stripping and excavation of asbestos and nickel impacted soils and disposal off-site at a licenced facility
2. Provision of an Asbestos Clearance Certificate for the removal of the asbestos impacted soils
3. Collection of soil validation samples from the walls and base of the resulting excavations
4. Importation of fill (if required) for landscaping, levelling and geotechnical requirements
5. Visual inspection and validation that hardstand has been restored across the hydrocarbon impacted area characterised by BH04.

Remediation Strategy 2

1. Stripping and excavation of nickel impacted soils and disposal off-site at a licenced facility
2. Stripping and excavation of asbestos impacted soils and natural soils (if required) and stockpiling on-site
3. Disposal of any geotechnically unsuitable material (i.e. topsoil with organic material) off-site to a licenced facility
4. Provision of an Asbestos Clearance Certificate for the excavation of the asbestos impacted soils
5. Collection of soil validation samples from the walls and base of the resulting excavations
6. Emplacement of asbestos containing soils beneath a marker layer, capping layer and hardstand paving surrounding the school building
7. Importation of fill (if required) for landscaping, levelling and geotechnical requirements
8. Visual inspection and validation that hardstand has been restored across the hydrocarbon impacted area characterised by BH04
9. Development of a Long Term Environmental Management Plan (LTEMP) to ensure the long term effectiveness of the remedial strategy

This RAP also includes a Construction Environmental and Waste Management Plan, a Work Health and Safety Plan and a Contingency Plan in addition to waste classification and soil validation requirements.

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Appendices

Tables

1 Introduction

Cardno (NSW/ACT) Pty Ltd ("Cardno") was engaged by DWP Australia Pty Ltd (DWP) to prepare a Remediation Action Plan (RAP) to guide and inform remediation of soils at Kyeemagh Infants School. The school is located on the corner of Jacobson Avenue and Beehag Street, Kyeemagh NSW 2216 ("the Site"). The Site is legally identified as Part Lot 1 within Deposited Plan (DP) 335734 and Lot 1 within DP 120095. The pre-school facility in the eastern portion of the Site is excluded from the scope of investigation. The location and features of the site are presented in **Figures 1** and **2** in **Appendix A.**

The Department of Education is proposing to redevelop the Site to increase its current capacity from a K-2 capable school to a K-6 capable school. The RAP has been prepared in accordance with the scope of works presented in Cardno's proposal dated 7 January 2019 in order to support submission of a Development Application for the site.

1.1 Background

The Site has an approximate area of 1.3 ha and is currently in use as an infant's school. The Department of Education is proposing to redevelop the Site to increase its current capacity from a K-2 capable school to a K-6 capable school. The development works will involve the demolition of all existing structures and construction of new facilities. The proposed development is declared as State Significant Infrastructure (Application Number SSD 9391) and in accordance with item 12.1 of the Secretary's Environmental Assessment Requirements (SEARS) for the project, a Detailed Site Investigation (DSI) was undertaken (Cardno, 2019a) in order to quantify any soil and groundwater contamination at the Site.

The findings of the DSI included identification of an area of bonded asbestos containing material (ACM) on and within soils in the eastern portion of the Site exceeding the adopted NEPM Tier I Health Screening Levels (HSLs) for continued use as a school. Additionally, an area of shallow topsoil was found to contain nickel concentrations above the adopted site specific Ecological Investigation Levels (EILs), an area of shallow fill was found to contain hydrocarbon fractions C_{16}-C_{34} above the adopted Ecological Screening Level (ESL) and Potential Acid Sulfate Soils (PASS) were identified at depth. Further details on the findings of the DSI are provided in **Section 2**.

Based on the findings of the DSI, Cardno concluded that the identified impacts could be managed and remedied in order to render the site suitable for continued use as a school. Cardno recommended that a RAP should be prepared to detail the remedial process and validation requirements for the site. This RAP has been prepared to address this recommendation.

1.2 Objectives

The objectives of the RAP are to:

- Define the remediation and validation requirements;
- Evaluate the effectiveness of potential remedial options;
- Recommend the most appropriate remedial strategy that will render the site suitable for the proposed land use;
- Establish the site validation criteria;
- Outline the remedial process to be undertaken to achieve the selected remediation strategy for the site; and
- Outline a Construction and Waste Management Plan (CWMP), Workplace Health and Safety (WHS) requirements, and an unexpected finds protocol and contingency plan;

Additionally, the RAP includes measures to minimise the potential risks to human health and the environment during implementation of the remedial works and under the proposed future land use.

1.3 Scope of Work

In order to meet the objects outlined in **Section 1.2** Cardno undertook the following scope of works:

- Defined the Site, site features and history, areas of environmental concern and developed a Conceptual Site Model (CSM)

- Identified remediation options suitable for identified COPCs;
- Evaluated the various remedial options and identified the preferred remediation strategy;
- Documented the process for implementation of the preferred remediation strategy;
- Development of a CEMP outlining environmental controls required for the duration of the works including an Unexpected Finds Protocol and contingency plan;
- Detail environmental and Work Health and Safety (WHS) control measures and community consultation requirements associated with implementation of the preferred remedial strategy; and
- Preparation of this RAP.

1.4 Guidelines and Legislation

The scope of work outlined above was completed in general accordance with following guidelines and legislation:

- ASSMAC (1998) *Acid Sulfate Soils Assessment Guidelines*, Acid Sulfate Soils Management Advisory Committee, August 1998;
- CCME (2010), *Canadian soil quality guidelines: carcinogenic and other polycyclic aromatic hydrocarbons (PAHs) (environmental and human health effects)*, Scientific criteria document (revised), Canadian Council of Ministers for the Environment ,2010
- Friebel, E & Nadebaum, P 2011, *Health screening levels for petroleum hydrocarbons in soil and groundwater. Part 1: Technical development document, CRC CARE Technical Report no. 10*, CRC for Contamination Assessment and Remediation of the Environment, Adelaide, Australia;
- HEPA (2018) *PFAS National Environmental Management Plan*, January 2018;
- NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Measure (NEPM)*. National Environment Protection Council (NEPC) 1999, Amendment 2013;
- NEPC (2013) *Schedule B(2) Guideline on Site Characterisation*, NEPM 1999, Amendment 2013;
- NSW Department of Urban Affairs and Planning (1998) *Managing Land Contamination: Planning Guidelines: SEPP 55 Remediation of Land*, 1998;
- NSW EPA (1995) *Contaminated Sites Sampling Design Guidelines*. New South Wales Environment Protection Authority (EPA), September 1995;
- NSW EPA (2017) *Guidelines for the NSW Auditor Scheme (3rd edition)*, New South Wales Environment Protection Authority, September 2017
- NSW OEH (2011) *Guidelines for Consultants Reporting on Contaminated Sites*. New South Wales Office of Environment & Heritage (OEH), November 1997, Reprinted September 2000, Reprinted August 2011;
- Standards Australia (2005) *Australian Standard AS 4482.1-2005 – Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compound*s. Standards Australia, Homebush, NSW; and
- Standards Australia (1999) *Australian Standard AS 4482.2-1999 - Guide to the sampling and investigation of potentially contaminated soil. Part 2: Volatile substances*. Standards Australia, Homebush, NSW.

2 Site Identification and History

2.1 Site Definition

The site is approximately 8 km south west of the Sydney CBD. The site location and site plan are provided in **Appendix A** with site details presented below in **Table 2-1**.

Table 2-1 Site Definition and Details

Item	Details
Site Address	Corner of Jacobson Avenue and Beehag Street, Kyeemagh NSW 2216
Approximate Site Area (ha)	1.3 ha
Title Details	Lot 1 DP 335734 and Lot 1 DP 120095
Local Government Area	Bayside City Council
Parish and County	St George, Cumberland
Current Site Owners	The Department of Education
Current Site Zoning	R2 Low Density Residential

2.2 Previous Assessment Results

Cardno was provided with the following previous reports relating to the Site:

- Cardno (Cardno, 2019a) – *Detailed Site Investigation – Kyeemagh Infants School, Corner of Jacobson Avenue and Beehag Street, Kyeemagh NSW,* prepared for DWP Australia, January 2019
- Parsons Brinckerhoff (PB, 2014a) *Asbestos Remediation Clearance Certificate*. Prepared 9 July 2014.
- Parsons Brinckerhoff (PB, 2014b) *Asbestos in Grounds, Asbestos Management Plan, Kyeemagh Infants School, Kyeemagh, NSW*. Prepared July 2014.

The Cardno 2019 DSI contains summaries of the PB 2014a and 2014b reports. A summary of the Cardno 2019 DSI is provided in **Section 2.2.1** below.

2.2.1 Cardno 2019 – Detailed Site Investigation - Kyeemagh Infants School, Corner of Jacobson Avenue and Beehag Street, Kyeemagh NSW, prepared for DWP Australia, January 2019

Cardno prepared a Detailed Site Investigation for the Kyeemagh Infants School site, excluding the North Brighton pre-school located adjacent the eastern site boundary, over the period November to December 2018. The objective of the DSI was to investigate the potential for soil and groundwater contamination at the site which may pose a risk to human health or the environment under the proposed redevelopment as a primary school.

The scope of work undertaken included a desktop site history assessment and field investigation. Based on the site history assessment, the Site has been used as a school since first being developed in 1942. The site configuration changed slightly over the years with the addition and removal of some structures. The land use surrounding the site is identified as generally low density residential housing, with the Cooks River and Muddy Creek being the closest bodies of water. Groundwater use in the area is generally for domestic and irrigation purposes, and there is reportedly one active bore on Site used for irrigation.

In order to investigate potential contamination at the site, Cardno advanced a total of 19 test pits, one hand auger and five boreholes across the site. The test pits and hand auger were advanced into natural soils, occurring between 0.2 and 1.2 metres below ground level (mBGL). Boreholes were advanced to depths of up to 17 mBGL within the proposed school building footprint, and depths of 5 mBGL in other areas for investigation of ASS. Three boreholes were converted into permanent monitoring wells to establish groundwater conditions at the site. Boreholes logs and a geological cross section are provided in **Appendix D**.

Cardno submitted soil, groundwater and fibre cement samples for analysis of Contaminants of Potential Concern (COPCs) associated with the site history, and ASS potential. Based on the analytical results the DSI identified the following:

- ACM was detected within soils and at the soil surface above the adopted human health screening levels in the grassed open area in the east of the site;

- Nickel concentrations within shallow topsoil exceeded the adopted ecological investigation levels adjacent to the staff carpark;
- Concentrations of the Hydrocarbon fractions C_{16}-C_{34} exceeded the adopted ecological screening levels at one borehole beneath asphalt hardstand, however it was determined that as this area was to remain capped by an impervious hardstand, there was a low potential for a complete source-pathway-receptor linkage and remediation was not considered necessary;
- Soils at depths of 7 meters below ground level (mBGL) and greater were determined to be PASS; and
- Copper was detected in groundwater slightly above the adopted assessment criteria for marine waters within MW02, however this was qualified as likely being representative of regional groundwater quality.

Based on the analytical results, Cardno concluded that the likely sources of contamination were:

- As a consequence of uncontrolled fill material;
- As a consequence of demolition of buildings containing hazardous building materials; and
- As a consequence of historical spills and leaks.

Cardno concluded that management and remediation of the identified impacts was required in order to render the site suitable for continued use as a school. Cardno recommended that remediation management or risk assessment would need to be undertaken and that a RAP and Acid Sulfate Soils Management Plan (ASSMP) should be prepared to address the identified impacts.

2.3 Site History Summary

Based on the available information, the Site is part of two lots and DPs that have been in use as a public school since 1942, and generally undeveloped land prior. Changes in site layout and surrounding properties such as the addition of buildings and infrastructure have occurred sporadically over time.

Cardno identified several minor sources of surface and subsurface impact listed above, indicating a limited area of surface soils and fill material impacted with bonded ACM, and an area of surface soils impacted with nickel which will require remediation or management. Additionally, soils at depth beneath the water table are considered to be PASS. Cardno concluded that the site could be made suitable for the intended use as a primary school if the areas of impact were addressed.

3 Site Conditions and Surrounding Environment

3.1 Site Description

The Site is currently used as an infant's school and has an area of approximately 1.3 ha. The land parcel is approximately rectangular in shape and is bounded by Jacobson Avenue to the South, Beehag Street to the west, and Tancred Avenue to the east. The northern boundary abuts low density residential housing. The western area of the Site contains the infant's school with classrooms, administrative buildings, amenities and recreation spaces. The centre of the site is primarily an open grassed play area. In the eastern area of the Site North Brighton Preschool occupies an approximately 1,700 m^2 area, which is excluded from the scope of the RAP. Figures detailing the Site location and surrounds, and plans for the proposed development are included in **Appendix A**.

Cardno conducted a site inspection on 10 November 2018 during field works for the DSI, with photographs from the site inspection included in **Appendix B**. Details of the observations made during the inspection are provided in **Table 3-1** below.

Table 3-1 Site Inspection Observations

Item	Observations
Current site use	Current site use is as an infant's school
Proposed site use	Future site use is for redevelopment to remain as a primary school
Site slope and drainage features	Site elevation is approximately 5 mAHD and is relatively level. Local topography is generally level with minor undulations and mounds. Drainage in surrounding streets is expected to be through a pit and pipe network via street guttering.
Vicinity Surface water bodies	The Cooks River is located approximately 240 m east north east of the Site, Botany Bay is located approximately 240 m south east of the Site, and Muddy Creek is located approximately 330 m north west of the Site. Muddy Creek drains into the Cooks River, which flows to Botany Bay.
Site surface coverings	The Site is mostly grassed, with areas of asphalt hardstand in play areas in the south western area of the Site. A graveled carpark is present in the north western corner of the Site accessed via Beehag Street.
Surface soils	Surface soils were visible in areas of sparse grass cover and consisted of sands and silty sands.
Buildings	Eight buildings are present in the western area of the Site which comprise the infants school facilities. Buildings include; ▪ A demountable office and classroom building in the north adjacent the carpark ▪ A metal building housing the Sustainable Community Hub adjacent garden beds south of the office ▪ A brick library building south west of the office ▪ A brick amenities building south of the office ▪ A clad classroom south of the Beehag Street entrance ▪ Two clad classroom buildings and a clad storage building adjacent the Jacobson Avenue boundary The preschool facility contains additional buildings which are not included within the investigation area.
Potential asbestos in building materials	Potential asbestos containing materials were observed in some buildings generally consisting of wall cladding to the buildings in the south adjacent to Jacobson Avenue.
Manufacturing, industrial or chemical processes and infrastructure	None observed.
Fuel storage tanks (USTs/ASTs)	None observed.
Dangerous goods	None observed.
Solid waste deposition	None observed.

Liquid waste disposal features	None observed.
Evidence of previous site contamination investigations	None observed.
Evidence of land contamination (staining or odours)	Fibre cement material was observed at the soil surface adjacent the access gate in the north eastern corner of the site, and adjacent TP19 (**Figure 3, Appendix A**).
Evidence of groundwater contamination	None observed.
Groundwater use	A functioning groundwater bore is present on site reportedly used for irrigation.
Vegetation	Mature trees are present primarily in the western infant's school area, and eastern pre-school area. The remainder of the Site is generally grassed or hardstand. Although grass cover was sparse in some areas, vegetation was generally observed to be healthy. Vegetation is mapped as Urban Exotic / Native (Native Vegetation of the Sydney Metropolitan Area, OEH)
Site fencing	The site is enclosed by a metal security fence on the eastern, western and southern boundaries, and a timber fence on the northern boundary.

3.2 Surrounding Land Uses

Land uses surrounding the site are detailed in **Table 3-2** and a map of the surrounds in shown in **Figure 1**, **Appendix A**.

Table 3-2 Surrounding Land Uses

Direction	Land Use or Activity
North	Low density residential followed by Mutch Avenue, Kyeemagh RSL Club and Muddy Creek
South	Jacobson Avenue followed by low density residential, General Holmes Drive and Botany Bay
East	Tancred Avenue followed by low density residential and the Cooks River, followed by Sydney Airport
West	Beehag Street followed by low density residential

The area is serviced by public roads and access to the site is available from Beehag Street to the west, and via a locked access way at the north eastern corner of the Site leading to Tancred Avenue.

3.3 Proposed Development

The proposed redevelopment aims to address demographic pressures identified in the Kogarah Primary Cluster by expanding the capacity of the school from a K-2 Infants School to K-6 primary school. The proposed school will have a capacity of up to 500 students. The redevelopment involves the demolition of all existing buildings in a staged process to allow the existing school to remain open. The concept design for the proposed development is included in **Appendix A**. New infrastructure includes;

- A main two storey building in the eastern area of the Site adjacent to the pre-school boundary, comprising the majority of the current grassed open area;
- An administration building in the central southern area of the Site;
- Hardstand and a hall building in the south west corner of the Site;
- A games court and refurbished carpark in the north western area of the Site; and
- Landscaping of the remainder of the Site.

3.4 Topography and Drainage

Site elevation is approximately 3 to 5 mAHD and is relatively level with a raised mound south of the Sustainable Community Hub. The local topography is generally flat with minor undulations and mounding. Surface water is expected to generally infiltrate into the sandy soils. Drainage in surrounding streets is by kerbside guttering. Likely stormwater discharge points are the Cooks River and Botany Bay.

3.5 Flood Potential

Cardno undertook a review of available flood mapping of the area surrounding the school in order to provide flooding advice (Cardno, 2018). The Cooks River Flood Study undertaken by Parsons Brinckerhoff for Sydney Water in 2008 indicates that the Site is unlikely to be affected by the 1% AEP or PMP flood events.

3.6 Regional Geology and Hydrogeology

3.6.1 Geology and Soil Landscape

The Soil Landscapes Map of Sydney 1:100,000 sheet indicates that the Site soils are comprised of Quaternary quartz sands with minor shell content, silt and fine sands (Qhbr). The NSW Office of Environment and Heritage eSPADE online GIS tool indicates that the site is characterised as part of the Tuggerah Soil Landscape, which is an Aeolian landscape with deep sandy soils with pH values ranging from 4.5 (strongly acidic) to 7.0 (neutral).

The subsurface profile encountered generally during the DSI (Cardno 2019a) consisted of topsoil and fill material consisting of sands and silty sands to a maximum depth of 2.2 metres below ground level (mBGL), with filling generally observed to be less than 1 m deep. Natural soils encountered generally consisted of sands and silty sands, with intermittent sandy clays present at greater depths.

The site is underlain by the Botany Sands Aquifer which is extensive, porous and highly productive. Groundwater flow is expected to be to the east towards the Cooks River or south towards Botany Bay with local variations in gradient. Static Water Levels (SWLs) gauged during the DSI (Cardno 2019a) from three monitoring wells on-site ranged between 3.8 and 3.9 metres below top of casing (ground level). Due to the proximity of the Site to Muddy Creek, the Cooks River and Botany Bay, groundwater at the Site may be tidally influenced.

3.6.2 **Acid Sulphate Soils**

The Rockdale Local Environment Plan 2011 lists the Site as within a Class 4 Acid Sulfate Soils (ASS) potential area, with a Class 3 area present to the north. There is potential for ASS to be present beneath the Site, and works below 2 m below ground level (mBGL), or which may lower the water table by 2m may pose an environmental risk. As part of the DSI (Cardno 2019a), an investigation into ASS beneath the Site was undertaken. Some potential indicators of ASS were identified during fieldworks (odour, shell inclusions), and analytical results confirm that Potential Acid Sulfate Soils (PASS) is present at the Site within sands and clays at depths greater than 7 mBGL.

3.6.3 **Salinity**

There is no data on the Salinity Hazard Map generated using the NSW planning Portal, therefore the potential occurrence of saline soil conditions at the Site is considered to be low.

4 Conceptual Site Model

This section summarises the previous environmental assessment and site historical information to confirm the Conceptual Site Model (CSM). Generally, a CSM provides an assessment of the fate and transport of COPCs relative to site specific, subsurface conditions with regard to their potential risk to human health and the environment. The CSM takes into account site specific factors including:

- Source(s) of contamination;
- COPCs associated with past and present site activities;
- Vertical, lateral and temporal distribution of COPCs;
- Site specific lithological information including soil type(s), depth to groundwater, effective porosity, and groundwater flow velocity and
- Actual or potential receptors considering both current and future land use both for the site and adjacent properties, and any sensitive ecological receptors.

Based on the information sourced in the DSI, a CSM has been developed and is outlined in **Table 4-1**, below. Additional details are included in the sections that follow as necessary.

Table 4-1 Conceptual Site Model (CSM)

Conceptual Site Model Element	Description
Contamination Sources	The sources of subsurface contamination include: ▪ uncontrolled placement of fill material ▪ uncontrolled demolition of buildings containing hazardous building materials ▪ historical spills and leaks
Site Current and Future Use	Current site use is as an infant's school. Future site is as a primary school.
Site Geology	Topsoil and fill material consisting of SAND and Silty SAND, underlain by medium to fine grain marine SAND and CLAY.
Site Hydrogeology	The Botany Sand Aquifer is present beneath the site. The SWL of groundwater at the Site measured from installed bores is 3.8 to 3.9 mBGL.
COPCs - Soil	The following COPCs have been identified above adopted Tier I screening criteria at the Site: ▪ Concentrations of asbestos have been detected within soils exceeding the adopted NEPM HSL at TP04, and fragments have been identified beneath turf at TP03, and at the soil surface adjacent TP19 and BH02; ▪ Concentrations of nickel have been detected exceeding the adopted Site Specific EIL at in two hotspots at TP06 and TP13; ▪ Concentrations of hydrocarbons (TRH C_{16}-C_{34}) have been identified exceeding the adopted NEPM ESL at BH04; and ▪ Potential Acid Sulfate Soils have been identified at depths greater than 7m at the site.
Extent of Impacts - Soil	The vertical extent of TRH C_{16}-C_{34} impacted soils identified at sample location BH04 is considered to be limited to the depth of fill material (0.5 mBGL). The lateral extent has conservatively been estimated as the distance to the nearest clean location, with an indicative area of 1,500 m^2. Concentrations of nickel were detected in surface soils greater than 2.5 times the adopted EIL in shallow surface soils at sample location TP06 and TP13. The vertical extent of impact is considered to be limited to the depth of fill (0.3 to 0.4 mBGL). The lateral extent has conservatively been estimated as the distance to the nearest clean location, with an indicative area of 1,300 m^2, to be confirmed during remedial works. Concentrations of asbestos in soil exceeded the adopted HSL at sample location TP04 within shallow fill, with fragments noted at on the soil surface adjacent to sample locations TP03, TP19, and BH02. The vertical extent of impact is considered to be the depth of fill, which varies between 0.3 mBGL at BH01 and 1.2 mBGL at TP03. The lateral extent of impact has been conservatively

	estimated as the distance to the nearest clean location, with an indicative area of 2,200 m^2, to be confirmed during remedial works.
COPCs – Groundwater	Copper was detected slightly above the NEPM GILs for marine waters in MW02 (0.002 mg/L).
Extent of Impacts - Groundwater	Given concentrations of copper within Site soils were within acceptable criteria, and the urbanized nature of the site and surrounds, the concentrations are likely to be a function of regional groundwater quality rather than a result of site contamination. Given the distance to the nearest receiving body, and the low levels detected, the potential risks from groundwater at the Site are considered low and acceptable.
Potential Human Receptors	Current and future users of the site, including students, staff, construction and maintenance workers. Current complete receptor pathways include an inhalation pathway to asbestos impacted soils.
Potential Environmental Receptors	On-site vegetation communities, and off-site receptors including aquatic communities in the Cooks River and Botany Bay. Current complete receptor pathways include contact / uptake by on-site ecological communities (vegetation, soil biota) of nickel impacted soils.

4.2 Conceptual Site Model Summary and Risk Assessment

The following sections summarise the Conceptual Site Model and an evaluation of potential risks to human and environmental receptors. Consideration should be given to any data gaps or uncertainties described in **Section 4.3** below.

4.2.1 Asbestos in Soils

ACM in the form of fibre cement debris was identified at the soil surface in two locations adjacent TP19 and BH02, beneath turf at TP03, and within shallow fill material at TP04 exceeding the adopted Tier I HSLs. The potential area of impact is located in the eastern section of the Site, adjacent to the pre-school boundary fence. The fill material encountered within the area consists of sand and silty sand, with variable depths of between 0.3 and 1.2 mBGL.

During development and under the proposed site use the soils pose a potential low inhalation risk to construction personnel, site users, and off-site receptors and will require remediation, management or risk assessment to mitigate the risk and render the site suitable for the proposed land use. Prior to the redevelopment being complete, remediation would be undertaken to remove the completed receptor pathway. The inhalation risk is considered to be low due to airborne fibre monitoring undertaken as part of the DSI during soil disturbance being below the exposure standard.

4.2.2 Nickel in Shallow Soils

Concentrations of nickel were detected above the Tier I Site Specific EIL in shallow soils at two locations (TP06_0.1 and TP13_0.1) adjacent the staff carpark. The fill material encountered consisted of silty and gravelly sands and gravel to depths of between 0.3 and 0.4 mBGL.

Under the proposed site use the soils pose a potential risk to receptors such as on-site vegetation. According to the proposed development plans, the area characterised by TP06 and TP13 is proposed to be beneath the school building, expanded carpark, or landscaped. The landscaping of the area is indicated to involve removal of surface soils and import of topsoil. The proposed works are likely to remove the nickel containing soils, or mitigate their contact with on-site vegetation. As such, prior to the redevelopment being complete, the completed receptor pathway to on-site vegetation is to be removed.

4.2.3 TRH C_{16}-C_{34} in Soils

Concentrations of TRH fractions C_{16}-C_{34} were detected above the adopted ESL at location BH04 beneath asphalt hardstand. Under the current and future site use, the area surrounding BH04 is to remain beneath hardstand, physically separated from ecological receptors such as on-site vegetation. Therefore, the source-pathway-receptor linkage is considered incomplete under the proposed redevelopment and no further action is considered necessary provided that the area remains as hardstand.

4.2.4 Potential Acid Sulfate Soils (PASS)

PASS have been identified beneath water table at the site at depths of 7 mBGL and greater. Works for the proposed development are unlikely to reach the water table or disturb PASS with the exception of piling for building foundations. The mitigation strategies, contingency controls and requirements for management of PASS at the site are contained within the Acid Sulfate Soils Management Plan (ASSMP) prepared by Cardno (Cardno, 2019b).

4.3 Data Gaps and Uncertainties

The recommendation made in this RAP were based on conclusions made by Cardno based on the results of discrete sampling undertaken as part of the DSI. However, subsurface conditions (soil, sediment and groundwater) can be complex and heterogeneous with many unknown geologic interactions that may affect the movement and/or concentrations of potential contaminants. Therefore should previously unidentified areas of soil impacts be discovered during future phases of work at the Site, additional investigation will be required.

Given the presence of fill on the site, there is likely to be some variability in the quality and type of the fill. Due to the discrete nature of ACM in soil, there is potential for ACM to be present in other areas. An Unexpected Finds Protocol should be employed to manage any previously unidentified areas of potential contamination.

Due to the Site being a working school, investigations were unable to be undertaken beneath buildings and therefore represent a data gap in site characterisation. While these data gaps are not considered to represent an impediment to the proposed development, if these soils are to be disturbed, in the future these soils require classification to enable appropriate management.

5 Remediation Objectives

5.1 Remediation Objectives

The purpose of the proposed remedial works is to manage and remediate the identified asbestos, hydrocarbon and nickel impacts at the Site in such a way that the potential risks posed to human health and the environment are minimised or eliminated.

The primary objectives for the remedial works are to:

> Manage identified hydrocarbon impacts in soils in such a manner that the potential risk to the environment is minimised;

> Remediate or manage asbestos and nickel impacted soils in such a manner that the potential risk to human health or the environment is minimised; and

> Remediate or manage asbestos and nickel impacted soils in such a manner that the Site is made suitable for the proposed land use as a primary school.

Based on results of the DSI, the potential risk to ecological receptors from copper levels within groundwater was considered low and acceptable due to the distance to the nearest potential receptor, and the likely regional nature of the COPC concentrations reported in groundwater. As such, no remedial works are considered necessary for groundwater at the Site.

The proposed remedial works will include collection of additional soil samples to validate that the excavated soil can be re-used on site, and that soil remaining at the site is suitable for the continued use as a primary school. The Remediation Goals (RGs) for the remediation works are summarised below.

5.2 Soil Validation Remediation Goals

The soil validation RGs for the proposed remediation are based on the National Environment Protection Council (NEPC) formulated the National Environment Protection (Assessment of Site Contamination) Measure (NEPM) in relation to investigation levels for soil and groundwater in the assessment of site contamination (NEPC 1999a).

As detailed in **Section 2** and shown in **Appendix A**, the site is proposed to be redeveloped for continued land use as a primary school. As per NEPM guidance, the criteria for low density residential land use with accessible soils are applicable to primary schools. Therefore, the applicable soil RGs are as follows:

> Asbestos

  - NEPM Health Screening Level (HSL) for asbestos contamination in soil for low density residential land use (HSL A)

> Nickel:

  - Site Specific Ecological Investigation Levels (EILs) for nickel concentrations for continued low density residential land use (HIL C). These values are generated from on-site physiochemical soil parameters via the Ecological Investigation Level Calculation Spreadsheet, developed by CSIRO for the National Environment Protection Council.

> Aesthetics:

  - Soils remaining onsite, particularly those near the soil surface, should not generate odour, be significantly stained, contain large quantities of inert waste or visible asbestos.

The quantitative validation criteria for each contaminant are provided in **Table 5-1** below.

Table 5-1 Soil Validation Criteria

Analyte	Guideline	Validation Criteria
Asbestos (ACM)	NEPM HSL A	0.01% Weight / Weight
Asbestos (Fibrous Asbestos and Asbestos Fines)	NEPM HSL A	0.001% Weight / Weight
Nickel	Site Specific EIL	8 mg/kg

5.3 Waste Classification Criteria

The soil analytical results collected during the DSI, remedial and validation works will be utilised to determine the waste classification of soil so it can be appropriately managed if transported off-site. The waste classification of the soil is based on the following guidelines:

- Natural soils at the site proposed for excavation have the potential for characterisation as Excavated Natural Material (ENM). To characterise natural soils as ENM, sample results will be compared to the chemical and other material property requirements included in Table 4 of the *Protection of the Environmental Operations (Waste) Regulation 2014 – the excavated natural material order 2014* (ENM order).
- If natural soil and fill material at the Site do not meet the ENM classification, comparison of analytical results will be made to criteria detailed in the *NSW DECCW (2014) Waste Classification Guidelines: Part 1: Classifying Waste* for waste classification purposes*.*

5.4 Triggers for Further Management

Further investigation or remediation may be required during the construction phase of the proposed works. Triggers for further management may include:

- Unexpected finds including impacted (visually stained and/or odorous) soils during earthworks;
- The presence of previously unidentified asbestos; and
- The identification of buried waste.

Where the triggers for further management are identified, refer to **Section 9.6** for the measures to be implemented.

6 Data Quality Objectives

6.1 Data Quality Objectives

The NSW EPA (2017) Guidelines for the NSW Site Auditor Scheme (3rd Edition), which is endorsed under s105 of the Contaminated Land Management Act 1997, requires that Data Quality Objectives (DQOs) be prepared for all assessment and remediation programs. The DQO process as adopted by the NSW EPA is described within US EPA (2000) Guidance for the Data Quality Objectives Process and Data Quality Objectives Process for Hazardous Waste Site Investigations.

The DQOs for the site investigation, as detailed within NSW EPA (2006), are summarised in **Table 6-1** below.

Table 6-1 Data Quality Objectives

DQO Step	Description
Step 1 State the Problem	Environmental media at the site have been impacted with COPCs at concentrations above the Tier I screening guidelines. Remediation or management of soils necessary to render the site suitable for the intended land use as a primary school.
Step 2 Identify the Decisions	The decisions that must be made are: 1. Identify suitable remedial strategies capable of mitigating the identified impacts? 2. Which remedial strategy(s) will most effectively remediate the site for the intended land use considering Site specific constraints? 3. How will the selected remedial strategy be implemented? 4. What are the validation criteria and how will the remedial works be validated?
Step 3 Identify Inputs to the Decision	The primary inputs to the decisions described above are: 1. Analytical results from previous investigations undertaken at the site; 2. Screening criteria made or approved by the NSW EPA for sensitive land uses (i.e. primary schools) 3. Analytical results of validation samples collected following excavation of impacted soils; 4. Observations made during site works concerning aesthetic issues, including odours, staining and waste inclusions. 5. An assessment of the suitability of the analytical data obtained, against the Data Quality Indicators (DQIs);
Step 4 Define the Study Boundaries	The study site is defined as Kyeemagh Infants School, being parts of Lot 1 DP 335734 and Lot 1 DP 120095. The lateral extent of the study is shown in **Figure 2**, and excludes the New Brighton Preschool. The vertical extent of sampling is limited to 2.2 mBGL for validation purposes and to the depth of proposed excavations for waste classification purposes. The temporal extent of the study will remain valid provided that the current and proposed land use remains the same, and that no further sources of contamination are detected or introduced to the site. The conclusions are limited to information gained during sampling conducted for the DSI in 2018. The remedial and validation process is anticipated to the conducted concurrent with the property redevelopment which could last several years.
Step 5 Develop a Decision Rule	The decision rules for the RAP include: 1. The number of soil validation points will meet the requirements for validation of the COPCs identified as per NEPM guidance; 2. Primary, duplicate and triplicate soil and groundwater samples will be analysed at National Association of Testing Authorities, Australia (NATA) accredited laboratories; 3. Field and laboratory QA/QC results will indicate reliability and representativeness of the data set, as defined in **Table 6-2** below;

DQO Step	Description
	4. Laboratory Limits of Reporting (LORs) will be below the applicable guideline criteria for the analysed COPC, where possible; 5. Applicable guideline criteria will be sourced from NEPM guidelines and other NSW EPA endorsed guidelines (as necessary); 6. Any soil aesthetic issues will be evaluated including areas of discolouration, odour and hazardous waste inclusions; 7. If the concentration of a soil COPC in a sample is below the applicable guideline criteria, then no further assessment/remediation will be required with respect to that COPC; 8. If the concentration of a COPC is less than applicable guideline criteria, then no further assessment/remediation will be required with respect to that COPC; and 9. If the concentration of a soil COPC in a sample exceeds the applicable guideline criteria, then additional works (e.g. remediation or quantitative risk assessment) may be required to minimise the risk.
Step 6 Specify Limits on Decision Errors	To ensure the results obtained are reproducible and accurate, a QA/QC plan is incorporated into the sampling and analytical program. DQIs are used to assess the reliability of field procedures and analytical results. In particular, the DQIs within NSW DEC (2006) are used to document and quantify compliance. DQIs are described as follows, and are presented in **Table 6-2** below: 1. Completeness – A measure of the amount of useable data from a data collection activity; 2. Comparability – The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event; 3. Representativeness – The confidence (expressed qualitatively) that data are representative of each media present on the site; 4. Precision – A quantitative measure of the variability (or reproducibility) of data; and 5. Accuracy (bias) – A quantitative measure of the closeness of reported data to the true value.
Step 7 Optimise the Design for Obtaining Data	To achieve the DQOs and DQIs, the following sampling procedures will be implemented to optimise the design for obtaining data 1. The number of soil sampling points for waste classification and spoil re-use will be in accordance with NEPM guidance and/or the NSW EPA Excavated Natural Material Order (2014) 2. Soil samples will be collected from resulting excavations of impacted soils at the rate specified in the NEPM for validation of an area of the size produced 3. Soil COPCs will be selected based on the area of concern as identified by previous data obtained during the DSI 4. Samples were be collected by suitably qualified and experienced environmental consultants 5. Soil samples will be collected and preserved in accordance with relevant standards/guidelines 6. NATA accredited laboratories will be engaged for analysis of samples 7. Soil observations including odours, staining and visual identification of potential asbestos bearing material will assist with selection of samples for laboratory analysis and the extent of remediation 8. Field and laboratory QA/QC procedures will be adopted and reviewed to indicate the reliability of the results obtained.

6.2 Data Quality Indicators

The following Data Quality Indicators (DQIs), referenced in Step 6 in **Table 6-1** have been adopted in accordance with the NSW EPA (2017) Guidelines for the NSW Site Auditor Scheme (3rd Edition). The DQIs outlined in **Table 6-2** assist with decisions regarding the contamination status of the site, including the quality of the laboratory data obtained.

Table 6-2 Data Quality Indicators

DQI	Frequency	Data Acceptance Criteria
Completeness		
Field documentation correct	All samples	All samples
Soil bore logs complete and correct	All samples	All samples
Suitably qualified and experience sampler	All samples	All samples
Appropriate lab methods and limits of reporting (LORs)	All samples	All samples
Chain of custodies (COCs) completed appropriately	All samples	All samples
Sample holding times complied with	All samples	All samples
Proposed/critical locations sampled	-	Proposed/critical locations sampled
Comparability		
Consistent standard operating procedures for collection of each sample. Samples should be collected, preserved and handled in a consistent manner	All samples	All samples
Experienced sampler	All samples	All samples
Consistent analytical methods, laboratories and units	All samples	All samples
Representativeness		
Sampling appropriate for media and analytes (appropriate collection, handling and storage)	All samples	All Samples
Samples homogenous	All samples	All Samples
Detection of laboratory artefacts, e.g. contamination blanks	-	Laboratory artefacts detected and assessed
Samples extracted and analysed within holding times	All samples	-
Precision		
Blind duplicates (intra-laboratory duplicates)	1 per 20 samples	30% RPD, then review RPDs >30% would be reviewed in relation to heterogeneity of sample and LOR
Split duplicates (inter-laboratory duplicates)	1 per 20 samples	30% RPD, then review RPDs >30% would be reviewed in relation to heterogeneity of sample and LOR
Laboratory duplicates	1 per 20 samples	<20% RPD Result > 20 × LOR <50% RPD Result 10-20 × LOR No Limit when RPD Result <10 × LOR
Accuracy		
Trip blanks	1 per sampling event (as required)	COPCs<LOR
Trip Spikes	1 per sampling event (as required)	70-130%
Surrogate spikes	All organic samples	50-150%
Matrix spikes	1 per 20 samples	70-130%
Laboratory control samples	1 per 20 samples	70-130%

DQI	Frequency	Data Acceptance Criteria
Method blanks	1 per 20 samples	<LOR

7 Remediation Options

7.1 Remediation Objective

The objective of the remedial works is to appropriately remediate or manage soil material at the Site identified with COPCs at concentrations above the NEPM Tier I screening guidelines to enable the site to be characterised as suitable for use as a primary school.

An evaluation of the applicable soil remedial options and identification of the recommended remedial strategy are included below.

7.2 Remediation Options Hierarchy

Soil remedial strategies potentially applicable to the site were evaluated along the following remediation hierarchy which is based on the recommended NSW EPA screening process.

1. "Do Nothing" The 'do nothing' option involves not removing or addressing any of the identified impacts
2. On-site treatment of soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable limit
3. Off-site treatment of excavated soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable limit, after which the soil is returned to the site
4. Removal of contaminated soil to an approved site or facility, and if necessary replacement with imported fill, and
5. Isolation and management of the soil on-site by capping/containment within an appropriate barrier.

7.3 Remedial Options Evaluation

Cardno has identified and evaluated the potential remedial options listed in the hierarchy above to provide a recommended remedial strategy to address the impacted soils at the Site. The options are described in **Table 7-1** below and the evaluation process is summarised in **Table 7-2**.

Table 7-1 Remedial Option Identification

Remedial Option	Discussion
Option 1: Do Nothing	This option involves not undertaking any remedial or management measures and proceeding with development.
Option 2: On-site treatment of soil	This option includes on-site treatment of soil through physical methods such as sieving and separation, and land farming to stimulate biological degradation and volatilisation of COPCs. Periodic soil sampling is undertaking during the process to determine if the COPCs concentrations have been reduced to levels below the RGs. If present, removal of ACM manually from the surface soils also constitutes on-site treatment of soil. This options may also include an in-situ treatment method such as chemical oxidation to change the chemical and/or physical characteristics of the COPCs. Post treatment monitoring is usually required to determine the efficacy of the treatment method. The COPC nickel identified at the Site is not volatile or readily biodegradable and therefore, the identified concentrations cannot be reduced though on-site land farming in a reliable or timely manner. The COPC asbestos (in the form of ACM) can be removed from soils to reduce levels below the RGs through treatment methods such as sieving and separation, given that the site soils are generally sand. Although there is some inherent risk and uncertainty of the success of the method.
Option 3: Off-site treatment of excavated soil	This option includes off-site treatment of soil through physical methods such as sieving and separation, and land farming to stimulate biological degradation and volatilisation of COPCs. Periodic soil sampling is undertaken during the land farming process to determine if COPCs concentrations have been reduced to levels below the RGs. This option is considered when there is not sufficient space on-site to remediate site soils. As described above, the identified COPC nickel is not volatile or readily biodegradable and therefore, the identified concentrations, cannot be reduced though off-site land farming in a reliable or timely manner.

Remedial Option	Discussion
	The COPC asbestos (in the form of ACM) can be removed from soils to reduce levels below the RGs through treatment methods such as sieving and separation, given that the site soils are generally sand. Although there is some inherent risk and uncertainty of the success of the method.
Option 4: Excavation and off-site disposal of impacted soil	This option includes the excavation and transportation of soil to an off-site facility licensed to accept the waste. The volume of material is tracked through waste dockets and weight tickets at the receiving facility. This remedial strategy is appropriate to address the identified COPCs at the site in a timely manner and is reliable at removing COPCs from the site at concentrations above the RGs.
Option 5: Isolation and management of the soil on-site by capping/containment	This option includes the encapsulation and/or capping of impacted soils with an appropriately designed cap such as concrete or hardstand. This remedial strategy relies on removing source-pathway-receptor linkage by eliminating the pathway between contamination and receptors and is appropriate for managing the COPCs identified at the site at concentrations above the RGs. The site is not expected to require extensive bulk excavation, however some excavation of shallow soils and importation of new topsoil for landscaping is required.

Based on the options above, the advantages and disadvantages of each remedial or management option including cost and applicability are compared in compared in **Table 7-2** below.

Table 7-2 Remedial Options Evaluation

Option	Description	Advantages	Disadvantages	Outcome
1	Do Nothing	▪ Elimination of remedial costs	▪ Does not address the RGs listed in **Section 5**, and as such the land would remain unsuitable for the proposed use	Unsuitable
2	On-site treatment of soil (asbestos only)	▪ Material is retained onsite ▪ Reduces risk to human health and the environment ▪ Reduces costs of off-site disposal ▪ Potentially removes liability for ongoing management	▪ Only applicable to asbestos impacted soils ▪ Costs of the excavation and screening process ▪ Inherent risk that soils may not meet validation goals, causing rework ▪ Community and stakeholder considerations of working with asbestos on-site.	Suitable (asbestos only)
3	Off-site treatment of soil (asbestos only)	▪ Material is retained onsite ▪ Reduces risk to human health and the environment ▪ Reduces costs of off-site disposal ▪ Potentially removes liability for ongoing management	▪ Only applicable to asbestos impacted soils ▪ Costs of the excavation and screening process ▪ Additional transport costs compared to Option 2 ▪ Inherent risk that soils may not meet validation goals, causing rework	Unsuitable
4	Excavation and offsite disposal of impacted soils.	▪ Minimises potential risks to human health and environment ▪ Economically viable for smaller, localised areas of contamination ▪ Takes advantage of excavation required for construction purposes ▪ Suitable long-term remediation option ▪ Removes liability for ongoing management	▪ Costs of offsite disposal at a licensed facility. ▪ Potential for larger quantities of material than expected to require disposal. ▪ Costs to import soil for construction purposes if required ▪ This strategy may require over-excavation and/or require importation of fill following disposal to return the site to its former grade, with associated costs.	Suitable

5	Isolation and management of the soil on-site by containment below a capping layer or hardstand	▪ Material is retained onsite ▪ Reduces risk to human health and the environment ▪ Reduces costs of off-site disposal ▪ Reduces need for additional excavation works	▪ May require over-excavation in order to place impacted material at depths below likely disturbance ▪ May require stockpiling and extended periods of work under asbestos conditions ▪ May require ongoing verification that the remedial strategy is suitable in the long term through implementation of a Long Term Environmental Management Plan ▪ May require a notification on the land title of the contamination retained on site.	Suitable

Based on the analysis included in the previous sections, Cardno recommends a combination of Option 4 (excavation and off-site disposal of impacted soils) and Option 5 (isolation of the soil on-site by containment) in order to address the impacts at the Site. These options involve either excavation and removal of asbestos, nickel and hydrocarbon impacted soils, or retention on site beneath an suitable capping layer. These options take advantage of excavation works required for site establishment, and of the capping potential of hardstand proposed for the redevelopment. These remedial options are effective at mitigating human health and ecological receptor pathways at the site by either removing the hazard, or isolating the impacted material.

At the time of this report, the finalised design and business case for implementing each option were pending. As such, Cardno have provided two remedial scenarios incorporating the preferred options above to render the site suitable for the proposed land use. Details of the preferred remediation strategies are provided in **Section 8**.

8 Remediation Strategy

As described above, two remedial scenarios incorporating Option 4 and Option 5 are provided in the following sections. Both Remediation Strategy 1 and Remediation Strategy 2 are capable of mitigating or removing potential human health and/or ecological exposure pathways to the asbestos, nickel and hydrocarbon impacts identified, and rendering the site suitable for the proposed land use as a primary school.

Details of the remedial strategies are outlined in the sections below. A Construction and Waste Management Plan is included in **Section 9**. Potential risks to future site workers can be managed through standard WHS practices which are detailed in **Section 10**. The soil validation plan is detailed in **Section 11**.

Should areas of previously unidentified contamination, including asbestos impacted soil, be encountered during the remediation and validation works, additional remedial measures may be required. If encountered, the Unexpected Finds Protocol detailed in **Section 9.6** should be implemented. Details on the requirements during small and larger scale asbestos removal, including WHS measures, are included in **Section 9.4.**

8.1.1 Data Gap Investigation

As described in **Section 4.3**, soils within building footprints have been identified as a Data Gap requiring investigation. This step in the process is applicable to both Remediation Strategy 1 and Remediation Strategy 2.

During the development process, as buildings are demolished and the soils become accessible, a suitably qualified environmental consultant will be engaged to undertake sampling of soils. The number of sampling locations per building footprint will be assessed prior to works, accounting for the previous sampling undertaken during the DSI, the proximity of the sampling points, and the size of the building footprint. It is likely that between one and three sampling points would be required per area. Samples will be submitted to a NATA accredited laboratory for analysis of COPCs relevant to the site use, historical analytical results, and field observations.

During this phase of works, additional sampling and inspection to refine the lateral extent of areas of impact for asbestos and nickel containing soils can also be undertaken. During preparation of the DSI, the extent of impact was estimated as to the nearest sampling point not impacted with COPCs above the adopted screening criteria. Methods such as shallow trenching and step-out sampling in approximately 3 m increments laterally from the sampling point of concern can be undertaken to inform finalised excavation dimensions.

The analytical results of the sampling will be compared to the Tier I Screening Criteria established in the DSI for the site and included within the data tables in **Appendix B**. Any exceedances of the criteria (if detected) will be assessed for significance, and if necessary, any impacts requiring remediation or management will be addressed and added as an addendum to this RAP.

8.1.2 Classification of Soils

An indicative waste classification was completed as part of the DSI for the Site (Cardno 2019a). In order to appropriately manage soils at the site requiring off-site disposal, a formal waste classification for the site should be produced to characterise fill material, and any natural soils requiring excavation and disposal. A review of the data obtained in the DSI should be undertaken and any additional sampling conducted in accordance with NEPM guidance and/or the NSW EPA Excavated Natural Material Order (2014).

8.2 Remediation Strategy 1

Remediation Strategy 1 involves a combination of off-site disposal of soils (Option 4) impacted with asbestos above the HSL and nickel above the EIL, and continued on-site containment (Option 5) of soils impacted with hydrocarbons above the ESL. This approach takes advantage of stripping and removal of shallow soils required for the development in order to remedy the impacts identified.

The remedial approach is to be performed jointly by a suitably qualified environmental consultant, occupational hygienist and a licensed contractor and will involve the following general steps:

1. Stripping and excavation of asbestos and nickel impacted soils and disposal off-site at a licenced facility
2. Provision of an Asbestos Clearance Certificate for the removal of the asbestos impacted soils
3. Collection of soil validation samples from the walls and base of the resulting excavations
4. Importation of fill (if required) for landscaping, levelling and geotechnical requirements

5. Visual inspection and validation that hardstand has been restored across the TRH impacted area characterised by BH04

Prior to works commencing, an Asbestos Management Plan / Asbestos Removal Control Plan must be developed by the licensed contractor detailing the proposed works and site specific control measures. All works involving asbestos must be undertaken in accordance with these plans, and the recommendations in **Section 9.4**.

8.2.1 Stripping and Excavation – Asbestos and Nickel Containing Soils

In order to remove the asbestos and nickel impacted soils at the Site, stripping of shallow topsoil and fill for off-site disposal at a licenced facility will be undertaken The general process for the works is as follows:

1. Engagement of a licenced asbestos removalist to undertake works involving asbestos removal and remediation
2. Preparation of an Asbestos Management Plan / Asbestos Removal Control Plan detailing the removal process and site specific control measures to be implemented;
3. Notification to SafeWork NSW of the intention to remove non-friable asbestos
4. Provision of Asbestos Air Monitoring (AAM) during disturbance of asbestos containing soils
5. Stripping of asbestos impacted topsoil and fill within the eastern area of the site as shown in **Figure 3** in **Appendix A**.
6. Provision of an Asbestos Clearance Certificate for site surfaces following works
7. Stripping of nickel containing topsoil surrounding TP13 and TP06 to depths of approximately 0.4 mBGL as shown in **Figure 3** in **Appendix A**.
8. Importation of certified topsoil for landscaping of proposed areas.

It is estimated that approximately 0.3 to 0.5 m of topsoil and fill will be removed across the majority of the two areas, with localised deeper filling expected at TP03 to 1.2 mBGL. Borehole logs and a geological cross section of the area are provided in **Appendix D**. During the excavation, a suitably qualified environmental consultant should be present to inspect the material excavated and guide the vertical and lateral extent. This process reduces the potential for over- or under-excavation and enables documentation of the works for validation purposes.

8.2.2 Soil Validation Sampling

Once the shallow soils are excavated from the areas of concern, the environmental consultant shall collect validation samples from the walls and base on the resulting excavations. It is anticipated that the validation samples will be collected directly from the exposed soils by a hand protected with a dedicated nitrile glove.

Fill material and topsoil is required to be imported to the site for landscaping, backfill or geotechnical purposes. The material imported should be accompanied by appropriate documentation stating it meets the requirements for use at the Site. Check sampling should be undertaken on imported material to verify its suitability.

Additional details on the soil validation and imported fill sampling plan are included in **Section 11**.

8.2.3 Visual Validation – Area Surrounding BH04

Following site development works, validation that the soils surrounding BH04 containing hydrocarbons C_{16}-C_{34} above the adopted ESL remain encapsulated beneath hardstand will be undertaken. The inspection will include a photographic log and as-built plans detailing that hardstand remains over the impacted soils, and that completed receptor pathways from ecological receptors such as vegetation are not present.

8.3 Remediation Strategy 2

Remediation Strategy 2 involves a combination of off-site disposal of soils (Option 4) containing nickel above the EIL, and on-site containment (Option 5) of soils impacted with asbestos above the HSL, and hydrocarbons above the ESL. This approach takes advantage of stripping and removal of shallow soils required for the development, and the use of hardstand areas for capping of soils in order to remedy the impacts identified.

Containment of the asbestos impacted soils would be beneath hardstand paving located around the main school building in the eastern portion of the site. The placement of the material beneath hardstand is subject to its suitability as certified by a qualified geotechnical engineer.

The remedial approach is to be performed jointly by a suitably qualified environmental consultant, occupational hygienist and a licensed contractor and will involve the following general steps:

1. Stripping and excavation of nickel impacted soils and disposal off-site at a licenced facility
2. Stripping and excavation of asbestos impacted soils and natural soils (if required) and stockpiling on-site
3. Disposal of any geotechnically unsuitable material (i.e. topsoil with organic material) off-site to a licenced facility
4. Provision of an Asbestos Clearance Certificate for the excavation of the asbestos impacted soils
5. Collection of soil validation samples from the walls and base of the resulting excavations
6. Emplacement of asbestos containing soils beneath a marker layer, capping layer and hardstand
7. Importation of fill (if required) for landscaping, levelling and geotechnical requirements
8. Visual inspection and validation that hardstand has been restored across the TRH impacted area characterised by BH04
9. Development of a Long Term Environmental Management Plan (LTEMP) to ensure the long term effectiveness of the remedial strategy

8.3.1 Stripping and Excavation – Nickel Containing Soils

In order to remove the nickel impacted soils at the Site, stripping of shallow topsoil and fill surrounding TP06 and TP13 will be undertaken for off-site disposal at a licenced facility. The general process for the works is as follows:

1. Stripping of nickel containing topsoil surrounding TP13 and TP06 to depths of approximately 0.4 mBGL as shown in **Figure 3** in **Appendix A**.
2. Collection of soil validation samples from the walls and base of the resulting excavations
3. Importation of certified topsoil for landscaping of the area

It is estimated that approximately 0.4 m of topsoil and fill will be removed across the majority of the area. Borehole logs are provided in **Appendix D**.

8.3.2 Stripping and Excavation – Asbestos Containing Soils

In order to contain asbestos impacted soils at the site located adjacent the pre-school boundary fence, stripping and stockpiling of the material will be undertaken for site preparation. The general process for the works is as follows:

1. Engagement of a licenced asbestos removalist to undertake works involving asbestos removal and remediation
2. Preparation of an Asbestos Management Plan / Asbestos Removal Control Plan detailing the removal process and site specific control measures to be implemented;
3. Notification to SafeWork NSW of the intention to remove non-friable asbestos
4. Provision of Asbestos Air Monitoring (AAM) during disturbance of asbestos containing soils
5. Stripping of asbestos impacted topsoil and fill within the eastern area of the site as shown in Figure 3 in Appendix A and stockpiling on-site
6. Provision of an Asbestos Clearance Certificate for site surfaces following works

8.3.3 Soil Validation Sampling

Once the shallow soils are excavated from the areas of concern, the environmental consultant shall collect validation samples from the walls and base on the resulting excavations. It is anticipated that the validation samples will be collected directly from the exposed soils by a hand protected with a dedicated nitrile glove.

Fill material and topsoil is required to be imported to the site for landscaping, backfill or geotechnical purposes. The material imported should be accompanied by appropriate documentation stating it meets the requirements for use at the Site. Check sampling should be undertaken on imported material to verify its suitability.

Additional details on the soil validation and imported fill sampling plan are included in **Section 11**.

8.3.4 On-Site Containment – Asbestos Containing Soils

Following stripping, excavation and site preparation works, the asbestos containing soils are to be placed beneath areas proposed for hardstand capping, namely the hard paving areas surrounding the main school building. Preference can be given to placement in areas required to be raised, such as the south-east corner of the Site adjacent to Jacobson Avenue.

Capping layers shall meet the requirements outlined in the ANZECC (1999) Guidelines for the On-Site Containment of Contaminated Soil. The nominal capping layer requirements include:

- A marker layer of high visibility geofabric or similar must be placed beneath and above the asbestos containing soils once emplaced, including lining of the side walls
- A buffer layer of uncontaminated material (such as site soils validated as suitable for re-use, or engineered fill such as DGB) such that the minimum depth between the surface and the contaminated soils is at least 0.3 m
- An impervious hardstand layer such as concrete, pavement etc.

During and following placement, the base, sides and top of the emplaced soils are to be surveyed and recorded to allow the capping details and location of emplaced soils to be incorporated into a Long Term Environmental Management Plan (LTEMP) and Asbestos Register for the Site.

During emplacement of the soils and construction of the capping layer, regular inspections shall be undertaken to ensure correct capping depths and methods are being followed. Following completion, a validation inspection should be undertaken to ensure the capping layer has been suitably constructed, confirming the isolation of the source from receptors and include a photographic log and as-built plans.

8.3.5 Visual Validation – Area Surrounding BH04

Following site development works, validation that the soils surrounding BH04 containing hydrocarbons C_{16}-C_{34} above the adopted ESL remain encapsulated beneath hardstand will be undertaken. The inspection will include a photographic log and as-built plans detailing that hardstand remains over the impacted soils, and that completed receptor pathways from ecological receptors such as vegetation are not present.

8.3.6 Long Term Environmental Management Plan

Following completion of site remediation and validation works, a Long Term Environmental Management Plan (LTEMP) would be required to detail the location and nature of the emplaced soils, and the ongoing responsibilities and management requirements for the material. The LTEMP would include strategies to avoid the likelihood of breaching the capping layer, and procedures to be following in the event a breach occurs.

9 Construction Environmental and Waste Management Plan

The following sections include a Construction Environmental and Waste Management Plan which provides measures required to minimise the potential impact of works on the local environment, site workers and third parties. In all cases, environmental issues must be managed by the Principal Contractor in accordance with good environmental management practices with periodic supervision and documentation by the appointed environmental consultant. The purpose of these measures is to prevent site workers, the public and environmental exposure to potential health risks associated with these works.

9.1 Stockpile Management

Soil may require temporary stockpiling based on the timing of the construction activities. Soil placed in stockpiles around the site will be tracked according to the location of removal and location of stockpile. Stockpiles in place longer than 24 hours will be placed on an impervious base, compacted and covered with geofabric or similar.

Stockpiles are to be contoured to minimise the loss of material during rainfall, with upstream drainage and levee banks installed to divert water flows around the stockpile. Silt fencing is to be appropriately placed and installed to avoid sediment loading of stormwater drains and pipes. The installation of these controls is to be undertaken in accordance with the Landcom (2004) “Blue Book”.

The stockpile(s) should be clearly labelled, with stockpiles containing asbestos materials appropriately identified with warning signage. In the event that larger stockpiles of asbestos, an area can be lined with plastic and used as a stockpiling area. Any stockpiled asbestos contaminated material should be dampened and covered with either geofabric layer or black plastic, which is to be disposed of as asbestos waste after completion of asbestos works.

9.1.1 Waste Tracking

Tracking of waste movements around the site and material transported off-site for disposal is a critical component to demonstrate the remedial strategy is being implemented appropriately. Waste tracking will be achieved through use of waste dockets, survey of stockpiled materials or excavations and photographic documentation of movements of soil around and off-site. An environmental scientist should be on-site to oversee the majority of the remedial works to ensure that appropriate waste tracking procedures are employed.

9.2 Excavation Water Management

It is not anticipated that the water table or dewatering will be required as part of the development. Should any excavations or works accumulate water, or if dewatering is required, water contained or that collects in the soil excavations will be pumped out of the excavation to stormwater/sanitary sewer per Bayside Council disposal requirements. The details of the discharge/disposal requirements of any water that collects in the excavation will require further consideration during the remedial and validation works. Any water intended for disposal (either off-site or to stormwater/sanitary sewer) will require sampling to ensure it meets discharge water quality requirements.

9.3 Air and Dust

9.3.1 Odours

Due to the nature of impact on-site, it is not anticipated that excessive odours will result from remediation works. However, qualified and experienced technical staff will be on site during all excavation works and should excessive odour be generated as a result of the process, on-site spraying of the excavated material with a suitable odour suppressant (ie. Anotec) will be undertaken to minimise any odour. Other options that may also be employed are:

- A reduction in the size of the excavation face that is open at any one time to reduce the surface area generating the odour;
- Location of any temporary stockpiles of impacted soil as far as possible (and in the predominant down wind direction) from sensitive receptors;
- Smothering of the odours by covering the portion of the site that is generating the odour; and
- Watering the stockpiles and excavations to minimise volatile emissions.

During excavation works, a PID and a Lower Explosive Limit (LEL) meter may be used to obtain readings and document VOC concentrations during activities when soil and groundwater are being disturbed.

9.3.2 Dust Control

The Principal contractor will be responsible for ensuring that excavation, loading, carting, and stockpiling operations are dust free. This may include (but is not limited to):

- Stockpile protection;
- Water application on stockpiles and access roads;
- Limiting the area of exposed excavations and surfaces; and
- Wind fences around earthworks areas.

In the event that excessive dust is generated during any operations on-site, the works will cease and modifications to the process will be made before the operation is resumed. There must be no observable dust transported off-site.

9.4 Removal of Asbestos Waste

Based on results of the DSI, asbestos has been identified at the site requiring remediation or management. The following practices should be followed.

9.4.1 Methodology

Contractors working with asbestos or in asbestos affected areas of the site will be required to prepare and lodge a Safe Work Method Statement and Asbestos Removal Control Plan for the Principal Contractor’s approval before commencing work. The chosen remedial contractor will be a certified Asbestos Removal Contractor. A Class B license is required for removal of bonded material and a Class A license for removal of friable asbestos. If the material is in a degraded state, then it would be considered friable by nature and therefore in that circumstance a Class A license contractor would be required. The Department of Education may also stipulate a Class A licensed contractor be employed for all asbestos works in accordance with their over-arching asbestos management procedures.

9.4.2 Stockpiling

If stockpiling of asbestos waste is required, the affected material should be placed on-site in a specified asbestos waste bin, prepared in accordance with referenced codes including:

- Locate bin on-site, away from adjacent land uses and other contaminated stockpiles, ideally over a concrete or bitumen paved area
- Bins shall be lined with minimum thickness of 200-micron heavy duty plastic sheet, formed and sealed to ensure leachate from asbestos contaminated material does not escape
- Exposed asbestos waste within the bin shall be lightly wetted regularly to reduce dust generation while loading and prior to plastic encapsulation;
- Asbestos waste within the waste bin shall be double wrapped in minimum thickness of 200- micron heavy duty plastic sheet or bagged in specific asbestos bags to code requirements;
- Sandbag or otherwise block any drainage around the waste bin
- Barricade the perimeter of the stockpiled/waste bin material
- In the event that larger stockpiles of asbestos or asbestos containing soils are required, an area can be lined with plastic and used as a stockpiling area
- Following removal of stockpiles of asbestos waste, an Asbestos Clearance Certificate for the stockpile area shall be issued by a suitably qualified occupational hygienist.

9.4.3 Decontamination

Adequate decontamination facilities are to be installed onsite in accordance with the guidelines specified in the Code of Practice for the Safe Removal of Asbestos [NOHSC2002 (2005)], Model Code of Practice for How to Safely Remove Asbestos (2018) and the NSW Occupational Health and Safety (Asbestos) Regulations 2003 and amendments

9.4.4 Respiratory Protection

If respirable fibres are identified, persons engaged in the asbestos removal work or accessing a contaminated area shall wear an approved respirator conforming to the requirements of SA/NZS 1715 and 1716.

9.4.5 Warning Notices

Suitable warning signs shall be placed around the works area. These signs shall comply with all relevant acts, regulations and codes of practice, including but not limited to:

- AS 1319-1983 – Dangerous Goods Act 1985;
- Dangerous Goods (Storage & Handling) Regulations 2000; and
- Dangerous Goods (Placarding of Workplaces) Regulations 1985.

9.4.6 Loading and Transporting of Asbestos Contaminated Materials (If Required)

If required, asbestos impacted waste is to be removed and disposed of in accordance with all relevant acts, regulations, standards and codes of practice.

Removal of waste materials from the site shall only be carried out by a licensed contractor holding appropriate licenses, consents and approvals from NSW EPA, SafeWork and/or other Authorities to transport and dispose of the asbestos waste materials according to the classification guidelines.

Asbestos waste must be transported in a covered leak-proof vehicle to prevent any spillage or dispersal of waste. Bonded asbestos not stored in a bag must be wetted before it is transported offsite. Asbestos fibres and dust waste are classified as friable and must be covered in a manner to prevent the emission of any dust.

Details of all contaminated materials removal from the site shall be documented with copies of weighbridge slips, trip tickets and consignment disposal confirmation (where appropriate). Such information should be provided to the Site Owner for reporting purposes. A site log shall be maintained by the licensed removal contractor for all waste stockpiles (numbered locations), to enable the tracking of disposed loads against on-site origin and location of the materials.

Measures shall be implemented to ensure no asbestos contaminated material is spilled onto public roadways or tracked off-site on vehicle wheels. Such measures could include the deployment of a vehicle washing/cleaning facility, which should be placed at a location before the site egress. The facility shall be capable of handling all vehicles and plant operating on site. Residue from the cleaning facility will be deemed contaminated unless show by validation to be below Reportable Acceptance Criteria.

The proposed waste transport route should be approved by council. Each load leaving the site shall be recorded. Any vehicle used for the transport of contaminated waste must be inspected before leaving the site to ensure that all residual waste is removed from the outside of the vehicle.

9.4.7 Asbestos Fibre Monitoring

A suitably qualified professional shall carry out appropriate air monitoring of the workplace and surrounding areas during asbestos remediation/removal works in accordance with the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust [NOHSC:3003(1988)] including but not limited to:

- Air monitoring at the commencement of asbestos removal activity on the site;
- Air monitoring continuously in areas related to hazard removal work;
- Air monitoring for clearance following removal of friable asbestos.

Air-monitoring results are to remain below control levels in designated areas and monitored by the environmental consultant / hygienist. These control levels are occupational hygiene best practice and are not health based standards (they are below the concentration set in NES for asbestos).The control levels shall be as per **Table 9-1:**

Table 9-1 Asbestos Control Levels

Control level (airborne asbestos fibres/ml)	Control / Action
< 0.01	Continue with control measures
≥ 0.01	Review control measures
≥ 0.02	Stop removal work and find the cause

9.4.8 Clearance Inspections

Following the removal of asbestos-contaminated materials, an inspection must be carried out with the licensed removal contractor, in order to establish areas which may require further remediation. All asbestos waste material must be removed from the work area prior to a clearance inspection.

The environmental consultant/hygienist may terminate the inspection if the work area is deemed to be contaminated and reconvene the inspection after follow-up remediation works to a satisfactory standard.

9.5 Acid Sulfate Soils Management

Potential Acid Sulfate Soils (PASS) have been identified at the site beneath the water table and depths of 7mBGL. Therefore, if ASS are proposed to be disturbed, the procedures outlined in the Acid Sulfate Soils Management Plan (ASSMP) (Cardno 2019b) must be implemented during the remedial and development process.

9.6 Unexpected Finds

In the case that an environmental consultant is not available for oversight, workers will be vigilant for hazardous materials that may be uncovered during excavations. Unexpected finds include, but are not limited to, odour, visual contamination, ASS or PASS, deleterious material inclusions, asbestos containing material, Underground Storage Tanks (USTs) or any other suspect materials. Any unexpected finds will be reported to the Contractor's on-site manager immediately. Additionally, the site owner/occupier should be informed as soon as practical following an unexpected find.

If hazardous materials are uncovered / discovered during excavations the Contractor shall:

- Cease all work in that vicinity (and fence the area if appropriate)
- Remove workers from the vicinity
- An experienced environmental consultant should be contacted to assess the potential risks associated with the Unexpected Finds and provide appropriate management options
- Investigate the nature of the risk of the materials, determine the appropriate response and document the actions in accordance with contractual obligations.

In the event of a serious unexpected find, which could cause harm to human health and/or the environment, the Bayside Council and the NSW EPA may need to be informed.

The risks posed by the removal works to Aboriginal or European heritage are expected to be minimal. However, in the event potential heritage items are encountered during excavations, works will cease and the Site Supervisor notified

9.7 Stormwater

9.7.1 Erosion and Sedimentation Control

Cleared areas and exposed excavations may promote erosion. The following erosion and sediment controls will be implemented:

- Limiting the extent of cleared areas and exposed excavations
- Backfilling of excavated areas as soon as practicable
- Diversion of stormwater from active areas using hay bales or sediment fences
- Covering of temporary stockpiles with plastic (HDPE) or geofabric and placement of silt socks around excavations when necessary
- Covering open stormwater grates in the vicinity of stormwater pits and excavations with silt fences or other appropriate materials
- Placement of stockpiles away from footpaths, roadways, kerbs, access ways or drainage lines
- Minimising translocation of contaminated soils throughout the site by ensuring excavator operators do not track over contaminated areas
- If possible, a single vehicle entry and exit to minimise translocating soil

- Depending on the volume of soil to be excavated, rumble strips may be required at the site access in order to prevent contaminated soil being transported off-site.

9.7.2 Water Management

Stormwater runoff quality may be adversely affected in the event of rainfall. Hay bales or similar mitigation measures will be placed near down-gradient stormwater entry points to prevent entry of contaminated sediment to stormwater, which may result from the project works.

9.8 Noise

Hours of operation, noise control and noise generating activities will comply with the DA requirements for the project.

9.9 Land Disturbance

Works include excavation, loading, carting and stockpiling operations of associated soils. These works shall be carried out in an orderly manner to minimise impact to the surrounding residences.

- Excavation – the removal of soil shall be performed by the appointed excavation contractor using an excavator. If a transport truck is not on-site during excavation and soil will need to be temporarily stockpiled, no contaminated soils should be placed on areas validated as suitable for the proposed land use. In these locations, soil shall be excavated and placed on black plastic liners or on concrete surfaces in discrete stockpiles prior to off-site disposal. Stockpiles should be segregated for each potential contamination source.
- Loading and Carting – the loading of the stockpile material shall occur with an appropriately sized machinery. The trucks and trailers shall be covered for transport as deemed necessary, and shall meet any other statutory requirements.

9.10 General

The appointed Principal Contractor shall ensure compliance with relevant SafeWork NSW guidelines and Work Health and Safety Acts and Regulations. The Principal Contractor shall also ensure compliance with any amendments to the Act or Regulations during the project duration.

The Principal Contractor shall monitor and control the access of all persons to the site and ensure that no unauthorised persons enter the site during remedial works (wherever practicable). All site personnel and visitors will be inducted and shall wear appropriate personal protective equipment (PPE).

The appointed Principal Contractor shall undertake additional underground and overhead service location specifically in areas surrounding the remediation location.

Any open excavation(s) are to be barricaded in accordance with the NSW Work Health and Safety Act; Clause 16 (1) and the Construction Safety Regulation Section 73, as administered by SafeWork NSW.

The appointed Principal Contractor shall install warning signs on the barricades surrounding the excavations, including but not limited to: DANGER: OPEN EXCAVATIONS; DANGER: NO SMOKING.

9.10.1 Vehicles

The appointed Principal Contractor shall ensure all vehicles are suitably contained and covered in the transport of all debris, spoil, rubbish and materials to or from the site, such that spillage or contamination of adjoining and other areas or property shall be prevented.

Vehicles shall also be maintained to prevent the transfer of mud or wastes onto adjacent streets or other areas. If wheel treads contain significant quantities of site soils the contractor will manually remove and dispose in stockpiles.

9.10.2 Traffic Control

The Principal Contractor shall supply signs and safety cones; erect at the appropriate entry and exit points; and maintain these devices in good condition. Excavation works, stockpiles and other hazards, shall be individually barricaded at all times. The site will be fully fenced to exclude public.

On-site pedestrian traffic will be averted from the work areas and excavation by means of signage, fencing and safety barricading.

9.10.3 Refuse Disposal

All site refuse, including food, equipment wrappings, unused materials, etc. shall be handled and disposed of appropriately into a skip.

9.10.4 Site Security

The site shall be secured by a lockable fence around the perimeter of the site and access to the site will be restricted. All excavations and above-ground remediation equipment will be barricaded with reflective barricades, with pertinent reflective signage. Keys to the gate will be restricted to approved personnel.

9.10.5 Training

Low environmental awareness of site workers may result in environmental impact including cross contamination of soil layers and off-site movement of contaminated soil. Accordingly, staff awareness training, inductions and daily tool box meetings shall be conducted.

9.10.6 Roles and Responsibilities

9.10.6.1 Client

A summary of the client's role and responsibilities includes:

- Overall responsibility for the project development and outcomes of the RAP
- Liaison with neighbours and other stakeholders
- Engagement of environmental management consultant to oversee implementation of the RAP
- Engagement of contractors to perform further investigation works, and any subsequent contaminated soil disposal and site rehabilitation works as required
- Provision of health and safety measures for site personnel and the works area
- Maintain relevant records associated with the RAP.

9.10.6.2 Principal Contractor

The principal contractor engaged for the management of impacted soils must:

- Undertake all works in compliance with the provisions of the RAP
- Liaison with site supervisor regarding progress of works
- Report any environmental incidents and unexpected finds to the site supervisor
- Collate all project documentation including landfill disposal dockets (where relevant)
- Conduct works in accordance with the Site WH&S plan.

9.10.6.3 Site Supervision

A Site Supervisor, who is an experienced environmental scientist familiar with the implementation of environmental controls, will be appointed to take responsibility for implementation of this RAP at the Site during excavation of impacted soils. The Site Supervisor's duties include:

- Regular inspection of the site and site activities
- Completion of the daily reporting sheet
- Provision of on-site advice and direction with regard to implementation and compliance with the RAP
- Liaison with site personnel/contractors and the client regarding progress of works
- Provide and maintain a photographic record of works and results
- Identification, reporting and management of the rectification of any non-conformances with the RAP.

10 Work Health and Safety

10.1 WHS Planning and Preparation

Prior to mobilising to complete the remedial works, the Principal Contractor and appointed remedial contractor will develop site and project specific Work Health and Safety Plans (WHSPs), Safe Work Method Statements and Job Safety Analyses for the scope of works to be undertaken. The WHS documentation will detail measures to mitigate potential risks to site workers, third parties and the local environment during the remedial works. General, minimal WHS procedures to be implemented during the remedial works are outlined as follows:

- The contaminants identified (asbestos) poses potential for exposure via inhalation. Respirators, dust masks and disposable coveralls should be available on site for all works involving asbestos. The additional management practices detailed in **Section 9.4** should also be followed and included in the WHSPs.
- Potential exposure pathways for contaminants include dermal absorption (skin contact, ingestion) of dust. All workers should wear long sleeve trousers/shirts on-site. Gloves and safety glasses shall be worn by all workers involved in handling of potentially contaminated soils.
- Protective footwear (steel capped boots) to be worn on site at all times.
- Hearing protection should be worn during soil removal activities (or when working in the vicinity of heavy plant/machinery).
- Unauthorised access should be limited by ensuring that security gates are locked at the completion of each day’s work.
- Excavations greater than 1.5m depth need to be “stepped” by the appointed civil contractor or otherwise made safe.
- Personnel are not to enter excavations (>1m depth) at any time.
- PPE shall be provided in sufficient quantities to provide for the duties of each on-site individual.

10.2 Incident Management Plan

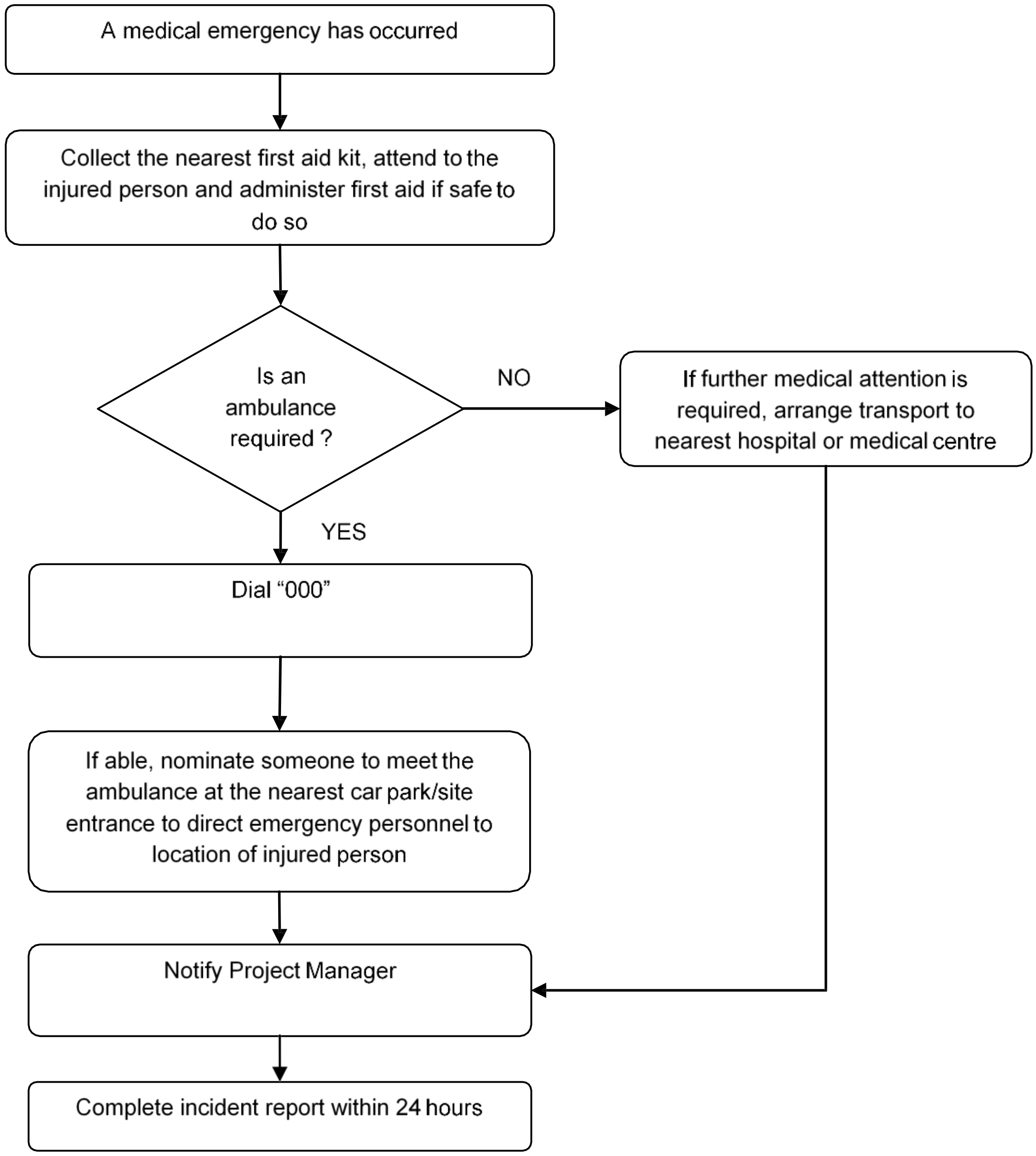
Emergency response includes pre-emergency planning, lines of authority and communication, emergency recognition and prevention, site control, evacuation routes, decontamination and first aid.

10.2.1 Medical Emergency/Serious Injury

In the event of an accident or an emergency situation involving a serious injury or medical emergency, immediate action must be taken by the first person to recognise the event (refer to flowchart below).

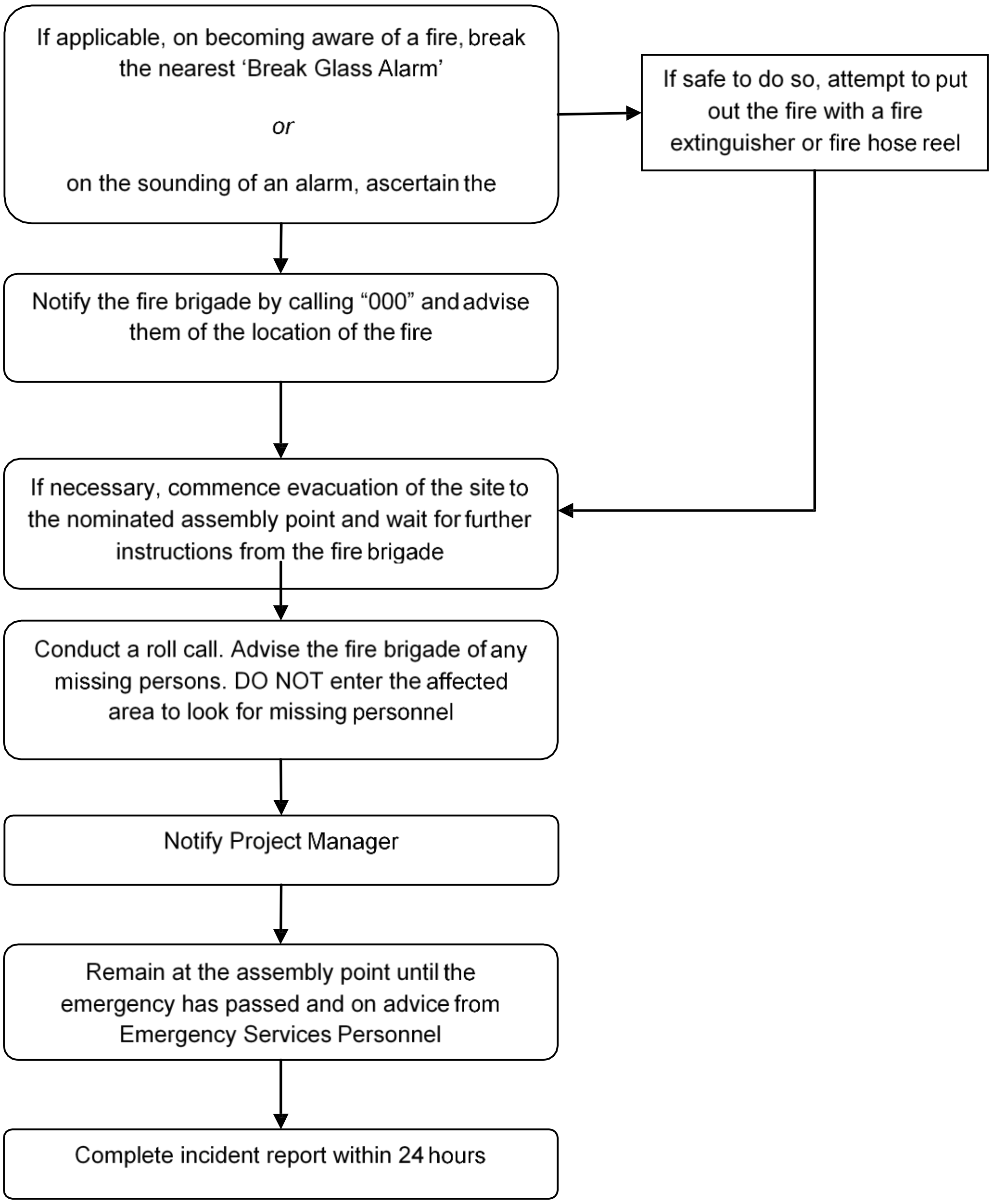
A portable and fully-stocked first aid kit shall be retained on site at all times.

In the event of a fatality, the Police, Site Manager, and Project Manager shall be notified immediately.


A medical emergency has occurred
Collect the nearest first aid kit, attend to the injured person and administer first aid if safe to do so
Is an ambulance required ?
NO
If further medical attention is required, arrange transport to nearest hospital or medical centre
YES
Dial “000”
If able, nominate someone to meet the ambulance at the nearest car park/site entrance to direct emergency personnel to location of injured person
Notify Project Manager
Complete incident report within 24 hours

10.2.2 Fire

In the event of a fire, the actions outlined in below shall be taken:



If applicable, on becoming aware of a fire, break the nearest 'Break Glass Alarm'

or

on the sounding of an alarm, ascertain the

If safe to do so, attempt to put out the fire with a fire extinguisher or fire hose reel

Notify the fire brigade by calling "000" and advise them of the location of the fire

If necessary, commence evacuation of the site to the nominated assembly point and wait for further instructions from the fire brigade

Conduct a roll call. Advise the fire brigade of any missing persons. DO NOT enter the affected area to look for missing personnel

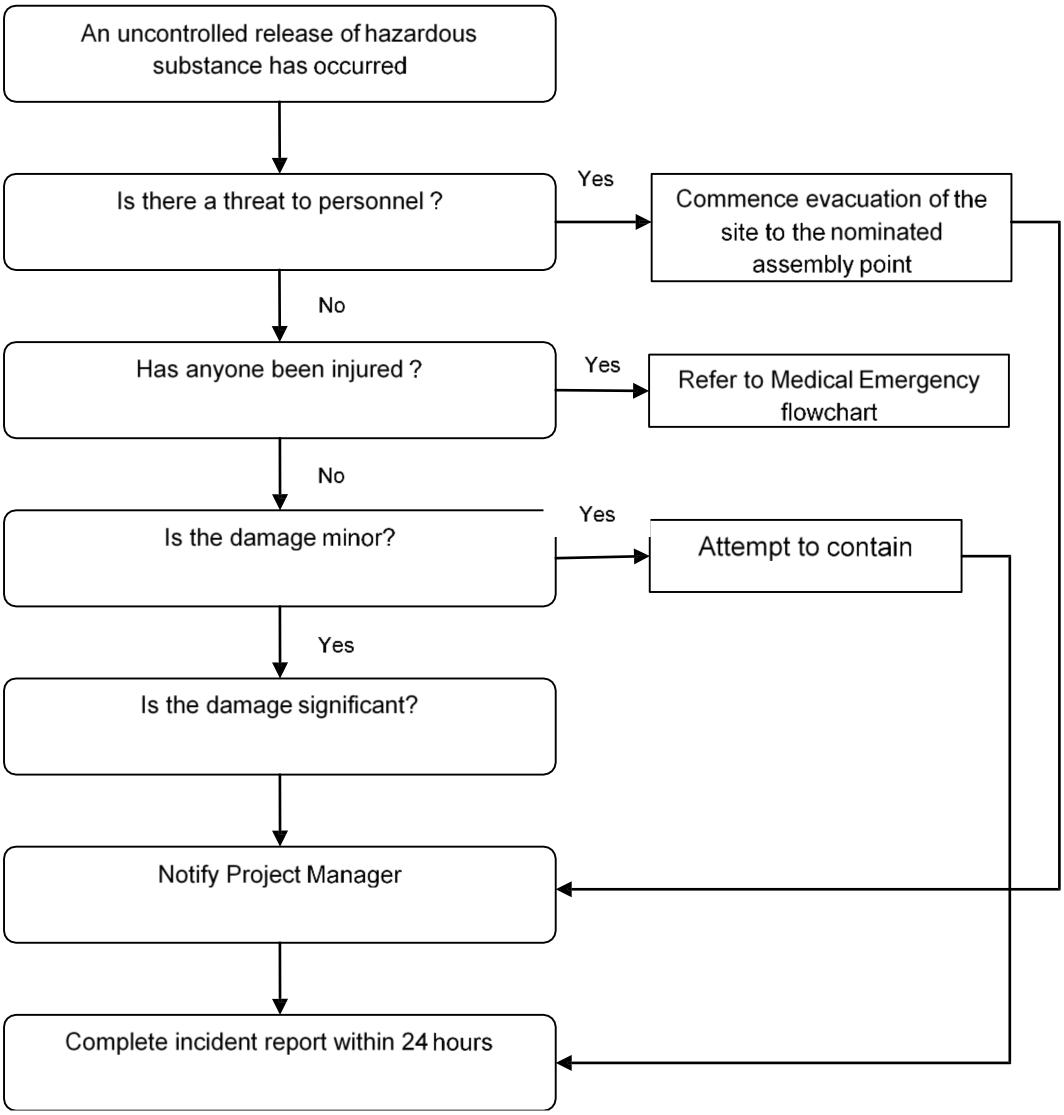
Notify Project Manager

Remain at the assembly point until the emergency has passed and on advice from Emergency Services Personnel

Complete incident report within 24 hours

10.2.3 Environmental Incident

In the event of an environmental incident, the actions outlined below shall be taken:



10.3 Incident Reporting

Cardno employees and sub-contractors are required to verbally report incidents, accidents and near-misses to the Project Manager immediately after an event has occurred. It is the responsibility of the Project Manger to notify the Client Representative immediately after the occurrence of an environmental incident and to forward the completed a written incident report within 24 hours. Additional investigations may be necessary should a serious incident occur.

10.4 Community Consultation

Cardno anticipates that community consultation will be required during the course of the remedial and validation works. Unless incorporated into other management documents, a detailed Community Consultation Plan may be developed to manage communications with third parties.

11 Sit Validation Requirements

During and after the remedial works are complete, additional soil samples will be required to:

- Validate the material proposed for re-use on-site is suitable for the proposed land use as a primary school
- Validate that soil remaining in place at the site is suitable for the proposed land use as a primary school
- Validate that on-site containment measures have been implemented appropriately (as required)
- Validate any imported soil is suitable for the proposed mixed commercial land use and is not a potential source of contamination.

11.1 Visual Inspection and Survey

Following excavation of asbestos impacted soils, and capping layer construction (if Remediation Option 2 is selected) a validation clearance inspection should be undertaken by a suitably qualified occupational hygienist to ensure asbestos containing materials have been removed from areas where impacted fill was required to be excavated. Areas of the Site in which asbestos materials and / or hydrocarbon containing soils have been capped should be inspected by a suitably qualified environmental consultant and validated to ensure adequate capping has been implemented. Initial survey followed by periodic inspections during the capping construction shall be undertaken to ensure recommended capping thicknesses are achieved and the Remedial Objectives for this project have been meet.

11.2 Post Excavation Validation Sampling

After soil is excavated from the area characterise by TP06 and TP13, and in asbestos impacted adjacent the eastern boundary, soil samples from the base and walls of the resulting excavation will be collected to validate the soil remaining on-site. The recommended density for collection of validation soil samples is 1 sample per 10 linear metres of sidewall and 1 sample per 100 m^2 of excavation base. However, this density should be doubled when asbestos has been identified as a COPC based on requirements in the NEPM.

Therefore:

- A minimum of one validation soil sample will be collected per 5 linear metres of sidewall and 50 m^2 of excavation base area for asbestos analysis in the east of the site;
- A minimum of one validation soil sample will be collected per 10 linear metres of sidewall and 100 m^2 of excavation base area for analysis of nickel in the area surrounding TP06 and TP13.

The post excavation soil samples will be analysed for the same parameters as listed in **Section 12.1**.
If the analytical results meet the RGs detailed in **Section 6**, the soil will be deemed suitable to remain in place under the proposed land use as a primary school.

11.3 Soil Re-Use Validation

If soils are required to be excavated and re-used on site for backfill or construction purposes, a review of data obtained during the DSI should be undertaken and, if necessary, additional soil samples collected by a suitably qualified environmental consultant. The target sample density for soil intended for re-use is 1 sample per 25 m^3 in accordance with NEPM guidance. The additional soil samples should be analysed by a NATA accredited laboratory for COPCs including (but not limited to) the following:

- Total Recoverable Hydrocarbons (TRH);
- Benzene, toluene, ethylbenzene, xylenes, naphthalene (BTEXN)
- Polycyclic aromatic hydrocarbons (PAHs)
- Eight metals (As, Cd, Cr, Cu, Ni, Pb, Zn and Hg)
- Quantitative Asbestos per NEPM.

If the soil analytical results of the additional sampling meet the NEPM Tier I screening guidelines for the proposed land use as a primary school, the soil will be deemed suitable for re-use on-site as fill.

11.4 Excavated Natural Material Sampling

As stated previously, excavation of natural soils for site development will be required and potentially disposed of off-site. There is no indication that the natural soils at the site above the water table are impacted with measurable COPCs and it is possible that they can be classified as ENM.

Soil samples of the natural material will be collected across the proposed excavation footprint. Soil samples will be collected in accordance with the sampling densities outlined in Tables 2 and 3 of the ENM Order for analysis of COPCs and other physical attributes listed in Table 4 in the ENM Order. These parameters include:

- TPH/TRH C10 to C36;
- BTEX;
- Total PAHs;
- The metals Hg, Cd, Pb, As, Total Cr, Ni and Zn;
- Physical parameters including pH, electrical conductivity, and foreign material inclusions

11.5 Imported Fill Sampling

Any soil imported to the Site, other than engineered materials, should be sampled to determine its suitability for the proposed land use. If imported fill material is accompanied by a VENM or ENM certificate, one sample per 1,000 m^3 should be collected. If imported fill material is not accompanied by a VENM or ENM certificate, one sample per 250 m^3 should be collected. Imported fill samples should be analysed for the COPCs and analytical methods including:

- Total Petroleum/Recoverable Hydrocarbons (TRH);
- Benzene, Toluene, Ethylbenzene, Total Xylenes and Naphthalene (BTEXN);
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Heavy Metals (Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc);
- Asbestos (weight/weight %)
- pH, EC and foreign materials

12 Contingency Plan

As with any remedial scope of work, unanticipated events or outcomes may be encountered during the remedial program. Cardno has developed contingencies throughout the RAP to mitigate risks associated with potential issues that may arise during the remedial works. Contingency items considered for the current remediation are summarised in **Table 12-1** noting that there may be other unforeseen circumstances that may arise during the course of the works.

Table 12-1 Remedial Works Contingency Plan

Potential Issue	Contingency Measure
Evidence of additional contamination not previously identified	Further assessment involving intrusive investigations or remediation may be required to quantify and delineate potential contamination.
Greater than anticipated volumes of soil require management	The proposed remedial strategy is scalable in that additional soil can be excavated. Off-site soil disposal is scalable for if large, unexpected volumes of soil are produced. In the case of additional contaminated soil being identified and on-site containment is feasible, excess natural soils may meet the definition of Excavated Natural Material for beneficial re-use off-site, and retention of impacted soils at the site.
Unintentional release of stockpiled soil or water drained from stockpile	Construction of appropriate erosion and sedimentation controls around stockpiles Spill equipment will be staged on-site during the remedial works. Weather forecasts will be monitored throughout the course of the remedial works to anticipate any significant storm events. Works may be suspended if large volumes of rain are anticipated. Soil stockpiles would be sufficiently covered prior to any storm event.
Water ingress to excavation is unmanageable	Consider aggressive means to remove the water (multiple vacuum trucks) or below ground dewatering equipment. Consider installation of a physical barrier to block the water ingress.

13 Regulatory Approvals / Licences

13.1 Regulatory Compliance Requirements

Regulations and sources of regulatory guidance relevant to this remediation programme relate to waste management, environment protection and occupational health and safety.

13.1.1 Waste Management

The remediation program must comply with the following legislation and policies

- *Waste Avoidance and Resource Recovery Act 2001*.
- *Protection of the Environment Operations (Waste) Regulation 2005*.
- NSW EPA (2014) *Waste Classification Guidelines.*

13.1.2 Environmental Protection

The remediation of asbestos impacted soils must be carried out in a manner compliant with national, state and local environmental regulations, including the

- *Protection of the Environment Operations Act 1997.*
- State Environmental Planning Policy (SEPP) 55 – Remediation of Land;
  - Given the minor nature of remediation work proposed to be undertaken at the Site, the works are considered to be Category 2 remediation work – work not needing consent. Whilst consent is not required, Clause 16 of SEPP 55 requires Council to be notified in writing at least 30 days before the commencement of work, and supply a Site Validation Report within 30 days of completion of works.
- *Contaminated Land Management Act 1997*
- National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013).

14 Conclusions

Cardno was engaged by DWP to prepare a RAP to guide and inform the remediation of soils at Kyeemagh Infants School, corner of Jacobson Avenue and Beehag Street, Kyeemagh NSW. The Site is proposed to be redeveloped from its current configuration as an infants school into a K-6 capable primary school.

The Site is located on a parcel of land that has been in use as a school since 1942. The DSI conducted by Cardno in 2018/19 identified areas of COPCs within soils requiring remediation or management. The identified areas of concern were an area of asbestos impacted soils above the adopted NEPM HSL in the east of the site, an area of nickel impacted topsoil above the site specific EIL in the northern area of the site, and an area of TRH C_{16}-C_{34} impacted soil above the adopted ESL beneath hardstand in the south west.

The objectives of the RAP are to define the soil remediation and validation requirements for the previously identified asbestos, nickel and TRH impacts at the Site. Additionally, the remedial strategies are designed to minimise the potential risks to human health and the environment relative to the proposed land use of the property as a primary school.

Cardno evaluated potentially applicable remedial alternatives to address the potential risks to human health and the environment. Due to the finalised design and business case for each option being pending at the time of this report, two remedial strategies are provided which will eliminate receptor pathways to the identified COPCs at the site. The recommended strategies involve a combination of off-site disposal of impacted soil, and on-site containment beneath hardstand. These strategies provide the most efficient option for remediating the site, taking advantage of soil removal required for construction purposes and the capping potential of hardstand for the new development.

The remedial strategies are to be performed jointly by an environmental consultant, occupational hygienist and a licensed contractor and will involve the following general steps:

Remediation Strategy 1:

1. Stripping and excavation of asbestos and nickel impacted soils and disposal off-site at a licenced facility
2. Provision of an Asbestos Clearance Certificate for the removal of the asbestos impacted soils
3. Collection of soil validation samples from the walls and base of the resulting excavations
4. Importation of fill (if required) for landscaping, levelling and geotechnical requirements
5. Visual inspection and validation that hardstand has been restored across the TRH impacted area characterised by BH04.

Remediation Strategy 2

1. Stripping and excavation of nickel impacted soils and disposal off-site at a licenced facility
2. Stripping and excavation of asbestos impacted soils and natural soils (if required) and stockpiling on-site
3. Disposal of any geotechnically unsuitable material (i.e. topsoil with organic material) off-site to a licenced facility
4. Provision of an Asbestos Clearance Certificate for the excavation of the asbestos impacted soils
5. Collection of soil validation samples from the walls and base of the resulting excavations
6. Emplacement of asbestos containing soils beneath a marker layer, capping layer and hardstand
7. Importation of fill (if required) for landscaping, levelling and geotechnical requirements
8. Visual inspection and validation that hardstand has been restored across the TRH impacted area characterised by BH04
9. Development of a Long Term Environmental Management Plan (LTEMP) to ensure the long term effectiveness of the remedial strategy

This RAP also includes a Construction Environmental and Waste Management Plan, a Work Health and Safety Plan and a Contingency Plan in addition to waste classification and soil validation requirements.

15 References

Cardno (2018) *Kyeemagh Public School – Flooding Advice*, letter dated 31 October 2018.

Cardno (Cardno, 2019a) *Detailed Site Investigation – Kyeemagh Infants School, Corner of Jacobson Avenue and Beehag Street, Kyeemagh NSW*, prepared for DWP Australia, January 2019

Cardno (2019b) *Acid Sulfate Soils Management Plan - Kyeemagh Infants School, Corner of Jacobson Avenue and Beehag Street, Kyeemagh NSW*, prepared for DWP Australia, January 2019

Parsons Brinckerhoff (PB, 2014a) *Asbestos Remediation Clearance Certificate*. Prepared 9 July 2014.

Parsons Brinckerhoff (PB, 2014b) Asbestos in Grounds, Asbestos Management Plan, Kyeemagh Infants School, Kyeemagh, NSW. Prepared July 2014.

DECC (2009) Contaminated Sites: Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997. Department of Environment and Climate Change NSW, Sydney. June 2009.

NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Measure (NEPM)*. National Environment Protection Council (NEPC) 1999, Amendment 2013;

NEPC (2013) *Schedule B(2) Guideline on Site Characterisation*, NEPM 1999, Amendment 2013;

NSW Department of Urban Affairs and Planning (1998) *Managing Land Contamination: Planning Guidelines: SEPP 55 Remediation of Land*, 1998;

NSW OEH (2011) *Guidelines for Consultants Reporting on Contaminated Sites*. New South Wales Office of Environment a& Heritage (OEH), November 1997, Reprinted September 2000, Reprinted August 2011;

Parsons Brinckerhoff (PB, 2014a) *Asbestos Remediation Clearance Certificate*. Prepared 9 July 2014.

Parsons Brinckerhoff (PB, 2014b) Asbestos in Grounds, Asbestos Management Plan, Kyeemagh Infants School, Kyeemagh, NSW. Prepared July 2014.

Standards Australia (2005) *Australian Standard AS 4482.1-2005 – Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compound*s. Standards Australia, Homebush, NSW; and

Standards Australia (1999) *Australian Standard AS 4482.2-1999 - Guide to the sampling and investigation of potentially contaminated soil. Part 2: Volatile substances*. Standards Australia, Homebush, NSW.

16 Limitations

This report has been prepared for the client, and their agents and the local council planning authority for the purpose of guiding and informing the remediation programme. Use of the report by other parties for different purposes shall be at their own risk. Whilst the assessment has used current industry practice to characterise the nature and extent of contamination at this site, and the author is satisfied with the quantity and quality of the information presented as the basis for this report, the Cardno cannot guarantee completeness or accuracy of any data, descriptions or conclusions based on information provided to it by others.

The agreed scope of this assessment has been limited for the current purposes of the Client. The remedial approach presented in this RAP may not remediate all types of contamination occurring in all areas of the site.

This Document has been provided by Cardno subject to the following limitations:

- This Document has been prepared for the particular purpose outlined in Cardno’s proposal and no responsibility is accepted for the use of this Document, in whole or in part, in other contexts or for any other purpose;
- The scope and the period of Cardno’s services are as described in Cardno’s proposal, and are subject to restrictions and limitations. Cardno did not perform a complete assessment of all possible conditions or circumstances that may exist at the site;
- Conditions may exist which may limit the effectiveness of the proposed remedial approach, including geologic and hydrologic conditions, the presences of services or other underground infrastructure. Accordingly, more than one phase of remediation may be required to achieve the goals of this RAP;
- In addition, it is recognised that the passage of time affects the information and assessment provided in this Document. Cardno’s opinions are based upon information that existed at the time of the production of the Document. It is understood that the services provided allowed Cardno to form no more than an opinion of the actual conditions of the site at the time this Document was prepared and cannot be used to assess the effect of any subsequent changes in the quality of the site, or its surroundings, or any laws or regulations.
- Where data supplied by the client or other external sources, including previous site investigation data, have been used, it has been assumed that the information is correct unless otherwise stated. No responsibility is accepted by Cardno for incomplete or inaccurate data supplied by others.
- Cardno may have retained sub consultants affiliated with Cardno to provide services for the benefit of Cardno. To the maximum extent allowed by law, the Client acknowledges and agrees it will not have any direct legal recourse to, and waives any claim, demand, or cause of action against, Cardno’s affiliated companies, and their employees, officers and directors.

This RAP is not any of the following:

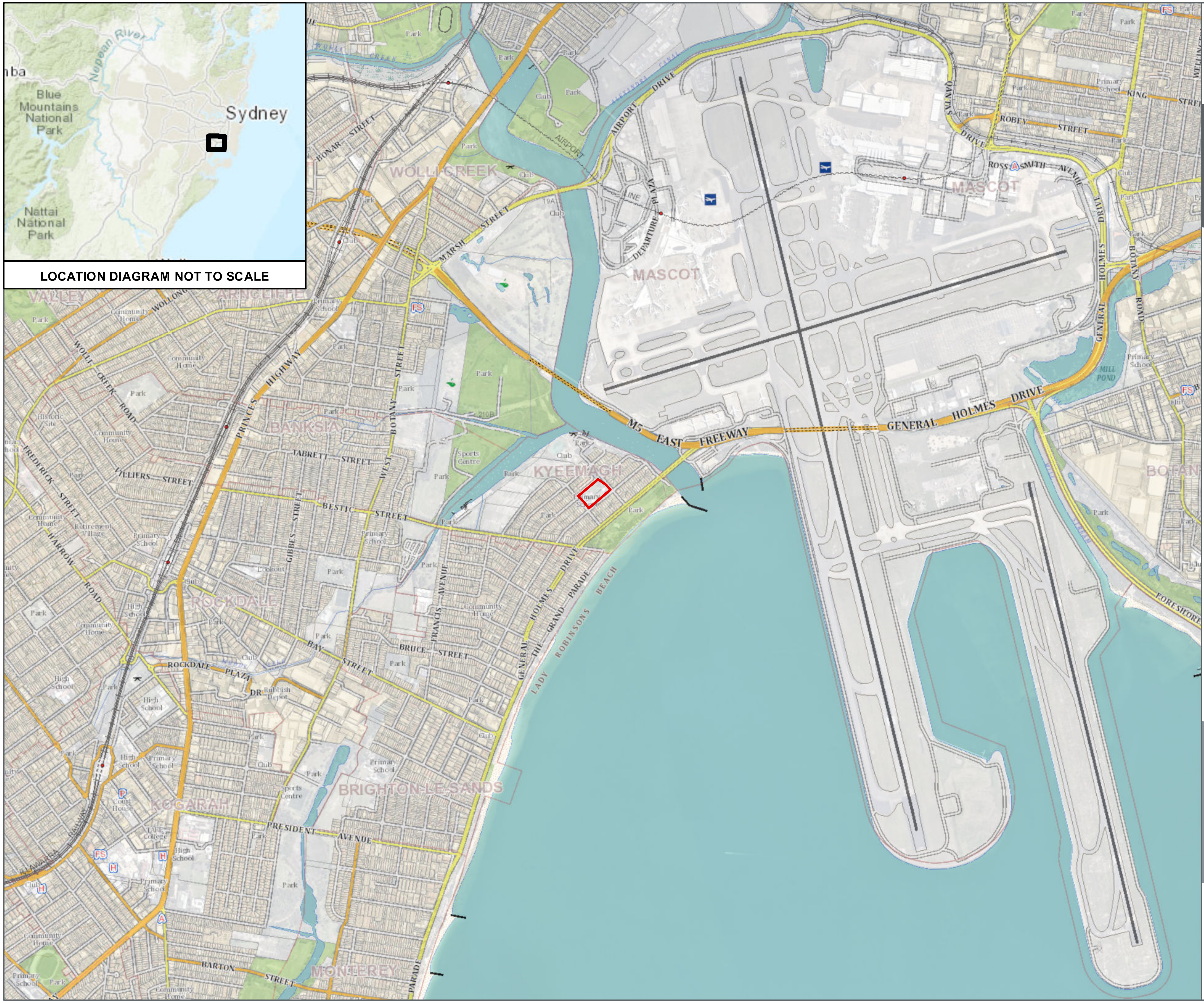
- A Site Audit Report or Site Audit Statement as defined under the Contaminated Land Management Act, 1997
- A Detailed ESA or Environmental Site Investigation sufficient for an Environmental Auditor to be able to conclude a Site Audit Report and Site Audit Statement
- A detailed hydrogeological assessment in conformance with NSW DEC (2007) Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination
- An assessment of groundwater contaminants potentially arising from other sites or sources nearby

A total assessment of the site to determine suitability of the entire parcel of land at the site for one or more beneficial uses of land.

APPENDIX

A

FIGURES



Kyeemagh Infants School

Detailed Site Investigation

REGION & VICINITY

Legend

☐ Site Boundary

FIGURE 1

1:20,000 Scale at A3

m
0 200 400 600 800

Cardno

Map Produced by NSW/ACT (WNE)
Date: 2018-12-11 | Project: 80818157
Coordinate System: GDA 1994 MGA Zone 56
Map: 80818157-GS-001-Location.mxd 01
Imagery supplied by nearmap 2018

Kyeemagh Infants School

Detailed Site Investigation

SITE PLAN &
INTRUSIVE LOCATIONS

Legend

🟥	Site Boundary
⊕	Borehole / Test Pit Locations
🟨	Excluded Area

FIGURE 2

1:800 Scale at A3

m
0 5 10 15 20

Cardno

Map Produced by NSW/ACT (WNE)
Date: 2018-12-11 | Project: 80818157
Coordinate System: GDA 1994 MGA Zone 56
Map: 80818157-GS-002-SitePlan.mxd 01
Imagery supplied by nearmap October, 2018

Kyeemagh Infants School

Detailed Site Investigation

AREAS OF CONCERN

Legend

🟥 Site Boundary

⊕ Borehole / Test Pit Locations

▭ Excluded Area

Areas of Concern (Indicative only)

🟩 EIL / ESL Exceedance

🟧 ACM In / On Soil

FIGURE 3

1:800 Scale at A3

Cardno

Map Produced by NSW/ACT (WNE)
Date: 2018-12-11 | Project: 80818157
Coordinate System: GDA 1994 MGA Zone 56
Map: 80818157-GS-003-ConcernAreas.mxd 01
Imagery supplied by nearmap October, 2018

Notes

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Verify all dimensions and levels on site and report any discrepancies to dwp for direction prior to the commencement of work.

Drawings are to be read in conjunction with all other contract documents.

Use figured dimensions only. Do not scale from drawings.
dwp cannot guarantee the accuracy of content and format for copies of drawings issued electronically. The completion of the Issue Details Checked and Authorised section is confirmation of the status of the drawing. The drawing shall not be used for construction unless endorsed 'For Construction' and authorised for issue.

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David Rose Nominated Architect NSW ARB 4882

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🟦	HOME BASE
🟩	PRACTICAL LEARNING SPACES
🟧	ADMINISTRATION
🟫	GROUP WORK
▨	HARD PAVING
🟪	HALL

SCHEMATIC DESIGN

NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
Q	SSD ISSUE	22.01.19	RS	BZ
P	CONCEPT DESIGN REPORT	24.08.18	DD	RS
N	CONSULTANTS REVIEW	13.08.18	DD	RS
M	PRG REVIEW	10.08.18	DD	RS
L	UPDATED LAYOUTS	02.07.18	DD	RS
K	PRG MEETING	04.07.18	DD	RS
J	CONCEPT DESIGN	29.06.18	DD	RS
H	CONSULTANTS REVIEW	25.06.18	DD	RS
G	PRG REVIEW	21.06.18	DD	RS
F	CONSULTANTS REVIEW	18.06.18	DD	RS
E	PRG MEETING	06.06.18	DD	RS
D	CONSULTANTS REVIEW	29.05.18	DD	RS
C	LAYOUT TO INCLUDE OHSC	21.05.18	DD	RS
B	EFSG PRESENTATION	26.04.18	DD	RS
A	EFSG PRELIMINARY REVIEW	19.04.18	DD	RS

Architect/ Designer
dwp
www.dwp.com

Client
NSW Dept of Education & School Infrastucture NSW

Project
KYEEMAGH PUBLIC SCHOOL

Location
JACOBSON AVE, KYEEMAGH NSW 2216

Project Number
AUSYD-17-0774

Drawing
GROUND FLOOR

Scale (A1)
As indicated

Date Printed
22-Jan-19 6:22:32 PM

Drawing Number
CS002

Issue
Q

File Name: BIM 360://dwp_17-0774 KYEEMAGH PUBLIC SCHOOL/AUSYD-17-0774_Kyeemagh Public School.rvt

dwp

APPENDIX

B

SITE PHOTOGRAPHS

Photograph 1: Site view, facing west from Jacobson avenue boundary, showing grassed open playing area and school infrastructure.

Photograph 2: Site view of school infrastructure, hardstand and BH04 location, facing east.

Photograph 3: Site view towards BH02 location showing the north site boundary abutting residential properties, the pre-school area, and access gate to Tancred Avenue.

Photograph 4: Clad buildings adjacent to Jacobson Avenue with potential ACM wall linings.

Photograph 5: TP12 location showing shallow fill and topsoil profile over sands within the open grassed area.

Photograph 6: TP10 location showing shallow topsoil profile over sands adjacent Jacobson Avenue.

Photograph 7: ABS2 location adjacent TP19 showing representative fibre cement fragments containing chrysotile asbestos at the soil surface.

APPENDIX

C

ANALYTICAL SUMMARY TABLES

				BTEX							TRH				
				Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.1	0.1	0.1	0.2	0.1	0.3	0.2	20	20	50	50	50
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m															
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs				50	85	70			105			120			
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m				1100	120,000	85,000			130,000						
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs															
NEPM 2013 HIL, Residential A															
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand															
0-1m				0.5	160	55			40						
1-2m				0.5	220	NL			60						
2-4m				0.5	310	NL			95						
>4m				0.5	540	NL			170						
Site	**Location**	**Field ID**	**Sample Date**												
Kyeemagh Infants School		TP01_0.2	10/11/2018	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	62	62
		TP01_0.9		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP02_0.1		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	63	110	173
		TP02_0.4		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP03_0.2		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP03_1.2		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP04_0.1		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP05_0.1		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP05_0.9		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP06_0.1		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	100	480	580
		TP06_0.3		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP07_0.1		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP07_0.4		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP07_0.6		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP08_0.4		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP09_0.3		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP10_0.1		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	91	91
		TP11_0.2		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP11_1.2		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	72	92	164
		TP12_0.2		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP13_0.1	17/11/2018	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	70	290	360
		TP13_0.4		-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.1		-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.7		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP15_0.1		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP15_0.6		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP16_0.1		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP16_0.8		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP17_0.1		-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.5		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP18_0.1		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP18_0.4		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP19_0.1	10/11/2018	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP19_0.3		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP20_0.1	17/11/2018	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		BH02_0.5		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		BH2_1.0		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		BH03_0.5		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		BH4_0.4	10/11/2018	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	370	1600	1970
		BH05_0.2-0.5		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP03_ASB1		-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.4		-	-	-	-	-	-	-	-	-	-	-	-
		ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
	TP12_0.2	QA200		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50
	TP16_0.1	QA300	17/11/2018	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
	TP16_0.1	QA400		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50

Statistical Summary

Maximum Concentration	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<20	<50	370	1600	1970
Average Concentration	0.052	0.06	0.06	0.11	0.06	0.15	<0.2	<20	<50	40	88	104
Standard Deviation	0.011	0.044	0.044	0.033	0.044	0.022		1	3	55	256	316

Soil Analytical Summary
Kyeemagh Infant School
Project: 80818157

DWP Architects
Pyrmont NSW

				CRC Care TRH Fractions							MAH									
				C6-C10	C10-C16	C16-C34	C34-C40	C10 - C40 (Sum of total)	F1: C6-C10 less BTEX	F2: >C10-C16 less Naphthalene	Total MAH	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				20	50	100	100	100	20	50	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m																				
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs					120	300	2800		180											
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m				82,000	62,000	85,000	120,000													
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs																				
NEPM 2013 HIL, Residential A																				
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																				
0-1m									45	110										
1-2m									70	240										
2-4m									110	440										
>4m									200	NL										
Site	**Location**	**Field ID**	**Sample Date**																	
Kyeemagh Infants School		TP01_0.2	10/11/2018	<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP01_0.9		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP02_0.1		<20	<50	130	<100	130	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP02_0.4		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP03_0.2		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP03_1.2		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP04_0.1		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP05_0.1		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP05_0.9		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP06_0.1		<20	<50	350	520	870	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP06_0.3		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP07_0.1		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP07_0.4		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP07_0.6		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP08_0.4		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP09_0.3		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP10_0.1		<20	<50	<100	150	150	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP11_0.2		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP11_1.2		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP12_0.2		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP13_0.1	17/11/2018	<20	<50	270	240	510	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP13_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.7		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP15_0.1		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP15_0.6		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP16_0.1		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP16_0.8		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP17_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.5		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP18_0.1		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP18_0.4		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP19_0.1	10/11/2018	<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP19_0.3		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP20_0.1	17/11/2018	<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		BH02_0.5		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		BH2_1.0		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		BH03_0.5		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		BH4_0.4	10/11/2018	<20	<50	1200	940	2140	<20	<50	-	-	-	-	-	-	-	-	-	-
		BH05_0.2-0.5		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP03_ASB1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
	TP12_0.2	QA200		<10	<50	<100	<100	<50	<10	<50	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP16_0.1	QA300	17/11/2018	<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
	TP16_0.1	QA400		<10	<50	<100	<100	<50	<10	<50	-	-	-	-	-	-	-	-	-	-

Statistical Summary

Maximum Concentration	<20	<50	1200	940	2140	<20	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Average Concentration	<20	<50	93	90	135	<20	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Standard Deviation	1	0	187	158	353	1	0	0	0	0	0					0	

				PAH																				
				Benzo(a)pyrene TEQ (half LOR)_	Benzo(a)pyrene TEQ (upper bound) *	Benzo(b+j)fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	BaP TEQ (zero)	Benzo(a)pyrene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Sum of total)	Phenanthrene	Pyrene
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m																				170			
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs												20											
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m																				29,000			
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs																							
NEPM 2013 HIL, Residential A				3																	300		
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																							
0-1m																				3			
1-2m																				NL			
2-4m																				NL			
>4m																				NL			
Site	**Location**	**Field ID**	**Sample Date**																				
Kyeemagh Infants School		TP01_0.2	10/11/2018	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP01_0.9		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP02_0.1		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP02_0.4		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP03_0.2		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP03_1.2		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP04_0.1		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP05_0.1		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP05_0.9		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP06_0.1		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP06_0.3		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP07_0.1		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP07_0.4		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP07_0.6		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP08_0.4		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP09_0.3		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP10_0.1		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP11_0.2		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP11_1.2		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP12_0.2		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP13_0.1	17/11/2018	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP13_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.7		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP15_0.1		1.2	1.5	<0.5	<0.5	<0.5	<0.5	1.1	0.9	0.7	<0.5	0.7	1	<0.5	1.3	<0.5	<0.5	<0.5	6.9	0.8	1.3
		TP15_0.6		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP16_0.1		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP16_0.8		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP17_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.5		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP18_0.1		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP18_0.4		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP19_0.1	10/11/2018	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP19_0.3		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP20_0.1	17/11/2018	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		BH02_0.5		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		BH2_1.0		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		BH03_0.5		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		BH4_0.4	10/11/2018	1.3	1.7	0.6	<0.5	<0.5	<0.5	<0.5	1	0.9	<0.5	0.8	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	3.4	<0.5	0.5
		BH05_0.2-0.5		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP03_ASB1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP12_0.2	QA200		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP16_0.1	QA300	17/11/2018	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP16_0.1	QA400		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Statistical Summary

Maximum Concentration	1.3	1.7	0.6	<0.5	<0.5	<0.5	1.1	1	0.9	<0.5	0.8	1	<0.5	1.3	<0.5	<0.5	<0.5	6.9	0.8	1.3
Average Concentration	0.6	1.2	0.3	<0.5	<0.5	<0.5	0.3	0.3	0.3	<0.5	0.3	0.3	<0.5	0.3	<0.5	<0.5	<0.5	0.5	0.3	0.3
Standard Deviation	0.1	0.1	0.1	0	0	0	0.1	0.2	0.1	0	0.1	0.1	0	0.2	0	0	0	1.1	0.1	0.2

				Asbestos			Metals								
				Asbestos from ACM in Soil (Y/N)	Asbestos from FA & AF in Soil (Y/N)	Detected (Y) / Not Detected (N)	Arsenic	Cadmium	Chromium (III+VI)	Copper	Iron	Lead	Mercury	Nickel	Zinc
				%w/w	%w/w	Comment	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR							2	0.4	5	5	20	5	0.1	5	5
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m							100		160	60		1100		8	230
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs															
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m															
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs				0.01	0.001										
NEPM 2013 HIL, Residential A							100	20		6000		300	40	400	7400
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand															
0-1m															
1-2m															
2-4m															
>4m															
Site	**Location**	**Field ID**	**Sample Date**												
Kyeemagh Infants School		TP01_0.2	10/11/2018	N	N	N	<2	<0.4	8.8	27	-	19	<0.1	15	44
		TP01_0.9		-	-	-	<2	<0.4	<5	<5	-	18	<0.1	<5	20
		TP02_0.1		N	N	N	<2	<0.4	18	9.4	-	35	0.7	15	72
		TP02_0.4		N	N	N	<2	<0.4	10	6.8	-	8.1	<0.1	9.6	27
		TP03_0.2		N	N	N	<2	<0.4	<5	6.6	-	19	<0.1	<5	35
		TP03_1.2		N	N	N	<2	<0.4	<5	<5	-	6.2	<0.1	<5	11
		TP04_0.1		N	N	N	<2	<0.4	<5	8.7	-	38	<0.1	<5	36
		TP05_0.1		N	N	N	<2	<0.4	<5	5.2	-	23	<0.1	<5	23
		TP05_0.9		-	-	-	<2	<0.4	<5	<5	360	<5	<0.1	<5	<5
		TP06_0.1		N	N	N	2.8	<0.4	130	37	-	8.1	<0.1	130	86
		TP06_0.3		-	-	-	<2	<0.4	13	16	-	11	<0.1	17	26
		TP07_0.1		N	N	N	2.5	<0.4	6.4	8.4	-	17	1.5	<5	46
		TP07_0.4		-	-	-	<2	<0.4	<5	<5	1500	11	0.2	<5	15
		TP07_0.6		-	-	-	<2	<0.4	<5	13	-	9	0.7	<5	20
		TP08_0.4		-	-	-	<2	<0.4	<5	<5	-	7.3	<0.1	<5	10
		TP09_0.3		N	N	N	<2	<0.4	<5	<5	-	10	<0.1	<5	14
		TP10_0.1		-	-	-	<2	<0.4	<5	<5	-	10	<0.1	<5	21
		TP11_0.2		N	N	N	<2	<0.4	<5	<5	-	<5	<0.1	<5	<5
		TP11_1.2		-	-	-	<2	<0.4	<5	<5	-	19	<0.1	<5	12
		TP12_0.2		N	N	N	<2	<0.4	<5	<5	630	13	<0.1	<5	17
		TP13_0.1	17/11/2018	N	N	N	<2	<0.4	32	12	-	11	<0.1	30	40
		TP13_0.4		N	N	N	-	-	-	-	-	-	-	-	-
		TP14_0.1		N	N	N	-	-	-	-	-	-	-	-	-
		TP14_0.7		-	-	-	<2	<0.4	<5	<5	-	<5	<0.1	<5	<5
		TP15_0.1		-	-	-	<2	<0.4	<5	16	-	65	0.1	<5	43
		TP15_0.6		-	-	-	<2	<0.4	<5	<5	-	<5	<0.1	<5	120
		TP16_0.1		-	-	-	<2	<0.4	<5	<5	-	17	<0.1	<5	18
		TP16_0.8		-	-	-	<2	<0.4	<5	<5	-	5.1	<0.1	<5	8.3
		TP17_0.1		N	N	N	-	-	-	-	-	-	-	-	-
		TP17_0.5		-	-	-	<2	<0.4	<5	<5	-	<5	<0.1	<5	<5
		TP18_0.1		N	N	N	<2	<0.4	<5	11	-	56	<0.1	<5	130
		TP18_0.4		-	-	-	<2	<0.4	<5	<5	-	<5	<0.1	<5	<5
		TP19_0.1	10/11/2018	N	N	N	<2	<0.4	<5	7.3	-	32	<0.1	<5	29
		TP19_0.3		N	N	N	<2	<0.4	<5	10	-	10	<0.1	<5	25
		TP20_0.1	17/11/2018	N	N	N	<2	<0.4	5.3	12	-	42	<0.1	<5	66
		BH02_0.5		N	N	N	<2	<0.4	<5	<5	-	9.8	<0.1	<5	17
		BH2_1.0		-	-	-	<2	<0.4	<5	5.6	-	12	<0.1	<5	24
		BH03_0.5		N	N	N	<2	<0.4	<5	<5	-	7	<0.1	<5	6.8
		BH4_0.4	10/11/2018	-	-	-	<2	<0.4	<5	11	-	13	<0.1	13	25
		BH05_0.2-0.5		-	-	-	<2	<0.4	<5	<5	-	<5	<0.1	<5	<5
		TP03_ASB1		N	N	Y	-	-	-	-	-	-	-	-	-
		TP04_0.4		0.1908	N	Y	-	-	-	-	-	-	-	-	-
		ASB2	17/11/2018	N	N	Y	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	-	-	-	<2	<0.4	<5	11	-	14	<0.1	<5	15
	TP12_0.2	QA200		-	-	-	<5	<1	<2	<5	-	8	<0.1	<2	10
	TP16_0.1	QA300	17/11/2018	-	-	-	<2	<0.4	<5	5.2	-	19	<0.1	<5	20
	TP16_0.1	QA400		-	-	-	<5	<1	<2	5	-	21	<0.1	<2	22

Statistical Summary

Maximum Concentration	0.1908	0	0	<5	<1	130	37	1500	65	1.5	130	130
Average Concentration				<5	<1	7.4	7.2	830	16	0.1	7.6	29
Standard Deviation				0.5	0.1	20	7.1	596	14	0.3	20	29

				Inorganics								VOCs			Organic	SVOCs
				% Clay*	Iron (%)	Conductivity (1:5 aqueous extract)	CEC	pH (Lab)	pH (Field)	pH (Fox)	Reaction Ratings	cis-1,4-Dichloro-2-butene	Pentachloroethane	trans-1,4-Dichloro-2-butene	TOC	EPN
				%	%	US/CM	meq/100g	pH_Units	PH UNITS	pH Unit	COMMENT	mg/kg	mg/kg	mg/kg	%	mg/kg
LOR				1	0.01	10	0.05	0.1	0.1	0.1		0.5	0.5	0.5	0.1	0.2
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m																
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs																
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m																
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs																
NEPM 2013 HIL, Residential A																
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																
0-1m																
1-2m																
2-4m																
>4m																
Site	**Location**	**Field ID**	**Sample Date**													
Kyeemagh Infants School	TP01_0.2		10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP01_0.9			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP02_0.1			-	-	-	-	-	-	-	-	-	-	-	-	<0.2
	TP02_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP03_0.2			-	-	-	-	-	-	-	-	-	-	-	-	<0.2
	TP03_1.2			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP04_0.1			-	-	-	-	-	-	-	-	-	-	-	-	<0.2
	TP05_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP05_0.9			<1	0.04	12	0.76	5.9	-	-	-	-	-	-	0.1	-
	TP06_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP06_0.3			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP07_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP07_0.4			<1	0.15	58	2.8	5.8	-	-	-	-	-	-	0.6	-
	TP07_0.6			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP08_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP09_0.3			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP10_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP11_0.2			-	-	-	-	-	-	-	-	-	-	-	-	<0.2
	TP11_1.2			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2			<1	0.06	31	1.9	5.9	-	-	-	-	-	-	0.7	<0.2
	TP13_0.1		17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	<0.2
	TP13_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP14_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP14_0.7			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP15_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP15_0.6			-	-	-	-	-	-	-	-	-	-	-	-	<0.2
	TP16_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.8			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP17_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP17_0.5			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP18_0.1			-	-	-	-	-	-	-	-	-	-	-	-	<0.2
	TP18_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP19_0.1		10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP19_0.3			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP20_0.1		17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	<0.2
	BH02_0.5			-	-	-	-	-	-	-	-	-	-	-	-	-
	BH2_1.0			-	-	-	-	-	-	-	-	-	-	-	-	-
	BH03_0.5			-	-	-	-	-	-	-	-	-	-	-	-	-
	BH4_0.4		10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH05_0.2-0.5			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP03_ASB1			-	-	-	-	-	-	-	-	-	-	-	-	-
	TP04_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-
	ASB2		17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	<0.2
	TP12_0.2	QA200		-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	-	-
	TP16_0.1	QA300	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.1	QA400		-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary

Maximum Concentration	<1	0.15	58	2.8	5.9	0	0	0	<0.5	<0.5	<0.5	0.7	<0.2
Average Concentration	<1	0.08	34	1.8	5.9				<0.5	<0.5	<0.5	0.5	<0.2
Standard Deviation	0	0.06	23	1	0.1							0.3	0

				Chlorinated Hydrocarbons													
				Vic EPA IWRG 621 CHC (Total)*	Vic EPA IWRG 621 Other CHC (Total)*	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane
				MG/KG	MG/KG	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m																	
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs																	
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m																	
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs																	
NEPM 2013 HIL, Residential A																	
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																	
0-1m																	
1-2m																	
2-4m																	
>4m																	
Site	**Location**	**Field ID**	**Sample Date**														
Kyeemagh Infants School	TP01_0.2		10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP01_0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP02_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP02_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP03_0.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP03_1.2			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
	TP04_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP05_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP05_0.9			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
	TP06_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP06_0.3			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
	TP07_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP07_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP07_0.6			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP08_0.4			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
	TP09_0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP10_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP11_0.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP11_1.2			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
	TP12_0.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP13_0.1		17/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
	TP13_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP14_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP14_0.7			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
	TP15_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP15_0.6			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
	TP16_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.8			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
	TP17_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP17_0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
	TP18_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP18_0.4			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
	TP19_0.1		10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP19_0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP20_0.1		17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH02_0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH2_1.0			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
	BH03_0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH4_0.4		10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH05_0.2-0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
	TP03_ASB1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP04_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ASB2		17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
	TP12_0.2	QA200		-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP16_0.1	QA300	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.1	QA400		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Statistical Summary																	
Maximum Concentration				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Average Concentration				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Standard Deviation				0	0	0	0	0	0	0	0		0		0	0	0

				Chlorinated Hydrocarbons																		
				2,2-dichloropropane	Bromochloromethane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Dibromomethane	Dichloromethane	Hexachlorobutadiene	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m																						
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs																						
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m																						
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs																						
NEPM 2013 HIL, Residential A																						
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																						
0-1m																						
1-2m																						
2-4m																						
>4m																						
Site	**Location**	**Field ID**	**Sample Date**																			
Kyeemagh Infants School	TP01_0.2		10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP01_0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP02_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP02_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP03_0.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP03_1.2			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP04_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP05_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP05_0.9			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP06_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP06_0.3			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP07_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP07_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP07_0.6			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP08_0.4			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP09_0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP10_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP11_0.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP11_1.2			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP12_0.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP13_0.1		17/11/2018	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP13_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP14_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP14_0.7			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP15_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP15_0.6			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP16_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.8			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP17_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP17_0.5			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP18_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP18_0.4			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP19_0.1		10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP19_0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP20_0.1		17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH02_0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH2_1.0			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	BH03_0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH4_0.4		10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH05_0.2-0.5			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP03_ASB1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP04_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ASB2		17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP12_0.2	QA200		<0.5	-	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5
	TP16_0.1	QA300	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.1	QA400		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary

Maximum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Average Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Standard Deviation		0	0	0	0	0	1	0	1	0	0	0	0		0	0	0	0	1

				Halogenated Hydrocarbons													
				1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dibromoethane	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Bromomethane	Chlorobenzene	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m																	
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs																	
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m																	
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs																	
NEPM 2013 HIL, Residential A																	
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																	
0-1m																	
1-2m																	
2-4m																	
>4m																	
Site	**Location**	**Field ID**	**Sample Date**														
Kyeemagh Infants School		TP01_0.2	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP01_0.9		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP02_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP02_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_0.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_1.2		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP04_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP05_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP05_0.9		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP06_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP06_0.3		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP07_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.6		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP08_0.4		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP09_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP10_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP11_0.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP11_1.2		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP12_0.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP13_0.1	17/11/2018	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP13_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.7		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP15_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.6		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP16_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP16_0.8		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP17_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.5		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP18_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP18_0.4		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP19_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP20_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH02_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH2_1.0		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		BH03_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH4_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH05_0.2-0.5		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP03_ASB1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP12_0.2	QA200		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<5	<0.5	<5
	TP16_0.1	QA300	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.1	QA400		-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary

Maximum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<5	<0.5	<5
Average Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<5	<0.5	<5
Standard Deviation			0	0	0	0		0	0	1	0	1	0	1

				Organochlorine Pesticides													
				Vic EPA IWRG 621 OCP (Total)*	Vic EPA IWRG 621 Other OCP (Total)*	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD
				MG/KG	MG/KG	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.1	0.1	0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m																180	
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs																	
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m																	
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs																	
NEPM 2013 HIL, Residential A									6		50						240
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																	
0-1m																	
1-2m																	
2-4m																	
>4m																	
Site	**Location**	**Field ID**	**Sample Date**														
Kyeemagh Infants School	TP01_0.2		10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP01_0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP02_0.1			1.46	0.7	0.06	<0.05	<0.05	0.64	<0.05	0.7	-	-	<0.05	<0.05	0.06	0.12
	TP02_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP03_0.2			<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05
	TP03_1.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP04_0.1			<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05
	TP05_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP05_0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP06_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP06_0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP07_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP07_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP07_0.6			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP08_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP09_0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP10_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP11_0.2			<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05
	TP11_1.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2			<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05
	TP13_0.1		17/11/2018	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05
	TP13_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP14_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP14_0.7			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP15_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP15_0.6			<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05
	TP16_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.8			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP17_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP17_0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP18_0.1			<0.1	<0.1	<0.05	<0.05	<0.05	0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05
	TP18_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP19_0.1		10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP19_0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP20_0.1		17/11/2018	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05
	BH02_0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH2_1.0			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH03_0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH4_0.4		10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH05_0.2-0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP03_ASB1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP04_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ASB2		17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05
	TP12_0.2	QA200		-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
	TP16_0.1	QA300	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.1	QA400		-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary

Maximum Concentration	1.5	0.7	0.06	<0.05	<0.05	0.64	<0.05	0.7	<0.05	<0.05	<0.05	<0.05	<0.2	0.12
Average Concentration	0.2	0.1	0.03	<0.05	<0.05	0.08	<0.05	0.1	<0.05	<0.05	<0.05	<0.05	<0.2	0.03
Standard Deviation	0.5	0.2	0.01	0	0	0.18	0	0.2			0	0	0	0.03

	Organochlorine Pesticides													
	Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	1
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m														
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs														
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m														
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs														
NEPM 2013 HIL, Residential A		270				10				6		10	300	20
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand														
0-1m														
1-2m														
2-4m														
>4m														

Site	Location	Field ID	Sample Date														
Kyeemagh Infants School		TP01_0.2	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP01_0.9		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP02_0.1		0.64	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
		TP02_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_0.2		<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
		TP03_1.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.1		<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
		TP05_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP05_0.9		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP06_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP06_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.6		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP08_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP09_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP10_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP11_0.2		<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
		TP11_1.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP12_0.2		<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
		TP13_0.1	17/11/2018	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
		TP13_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.7		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.6		<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
		TP16_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP16_0.8		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP18_0.1		0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
		TP18_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP20_0.1	17/11/2018	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
		BH02_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH2_1.0		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH03_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH4_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH05_0.2-0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_ASB1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
	TP12_0.2	QA200		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	-
	TP16_0.1	QA300	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.1	QA400		-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary

Maximum Concentration	0.64	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
Average Concentration	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
Standard Deviation	0.18		0	0	0	0	0	0	0	0	0	0	0	0

				Organophosphorous Pesticides																
				Tokuthion	Azinophos methyl	Bolstar (Sulprofos)	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S	Diazinon	Dichlorvos	Dimethoate	Disulfoton	Ethion	Ethoprop
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.2	0.2	0.2	0.05	0.05	0.2	0.2	0.2	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m																				
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs																				
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m																				
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs																				
NEPM 2013 HIL, Residential A							160													
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																				
0-1m																				
1-2m																				
2-4m																				
>4m																				
Site	**Location**	**Field ID**	**Sample Date**																	
Kyeemagh Infants School		TP01_0.2	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP01_0.9		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP02_0.1		<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
		TP02_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_0.2		<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
		TP03_1.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.1		<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
		TP05_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP05_0.9		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP06_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP06_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.6		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP08_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP09_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP10_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP11_0.2		<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
		TP11_1.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP12_0.2		<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
		TP13_0.1	17/11/2018	<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
		TP13_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.7		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.6		<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
		TP16_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP16_0.8		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP18_0.1		<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
		TP18_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP20_0.1	17/11/2018	<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
		BH02_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH2_1.0		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH03_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH4_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH05_0.2-0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_ASB1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	TP12_0.2	QA200		-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	<0.05	<0.05	<0.05	-	<0.05	-
	TP16_0.1	QA300	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.1	QA400		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary

Maximum Concentration	<0.2	<0.2	<0.2	<0.05	<0.05	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Average Concentration	<0.2	<0.2	<0.2	<0.05	<0.05	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Standard Deviation	0	0	0			0	0	0	0	0	0	0	0	0	0	0	0

				Organophosphorous Pesticides																
				Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Phorate	Prothiofos	Pyrazophos	Ronnel	Terbufos	Trichloronate	Tetrachlorvinphos
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.2	0.2	0.2	0.2	0.2	0.2	0.2	2	0.2	2	0.2	0.05	0.2	0.2	0.2	0.2	0.2
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m																				
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs																				
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m																				
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs																				
NEPM 2013 HIL, Residential A																				
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																				
0-1m																				
1-2m																				
2-4m																				
>4m																				

Site	Location	Field ID	Sample Date	Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Phorate	Prothiofos	Pyrazophos	Ronnel	Terbufos	Trichloronate	Tetrachlorvinphos
Kyeemagh Infants School		TP01_0.2	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP01_0.9		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP02_0.1		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
		TP02_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
		TP03_1.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.1		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
		TP05_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP05_0.9		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP06_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP06_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.6		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP08_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP09_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP10_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP11_0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
		TP11_1.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP12_0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
		TP13_0.1	17/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
		TP13_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.7		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.6		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
		TP16_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP16_0.8		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP18_0.1		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
		TP18_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP20_0.1	17/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
		BH02_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH2_1.0		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH03_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH4_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH05_0.2-0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_ASB1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
	TP12_0.2	QA200		-	-	<0.05	<0.05	-	<0.2	-	<0.2	-	-	-	<0.05	-	-	-	-	-
	TP16_0.1	QA300	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.1	QA400		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary

Statistical Summary	Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Phorate	Prothiofos	Pyrazophos	Ronnel	Terbufos	Trichloronate	Tetrachlorvinphos
Maximum Concentration	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.05	<0.2	<0.2	<0.2	<0.2	<0.2
Average Concentration	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.05	<0.2	<0.2	<0.2	<0.2	<0.2
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0

				Solvents							Pesticides					Polychlorinated Biphenyls							
				Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Acetone	Allyl chloride	Carbon disulfide	Vinyl acetate	Demeton-S-methyl	Fenamiphos	Parathion	Pirimiphos-methyl	Pirimphos-ethyl	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Sum of total)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.5	5	0.5	0.5	0.5	0.5	5	0.05	0.05	0.2	0.2	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m																							
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs																							
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m																							
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs																							
NEPM 2013 HIL, Residential A																							1
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																							
0-1m																							
1-2m																							
2-4m																							
>4m																							
Site	**Location**	**Field ID**	**Sample Date**																				
Kyeemagh Infants School		TP01_0.2	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP01_0.9		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP02_0.1		-	-	-	-	-	-	-	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		TP02_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_0.2		-	-	-	-	-	-	-	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		TP03_1.2		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.1		-	-	-	-	-	-	-	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		TP05_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP05_0.9		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP06_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP06_0.3		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.6		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP08_0.4		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP09_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP10_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP11_0.2		-	-	-	-	-	-	-	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		TP11_1.2		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP12_0.2		-	-	-	-	-	-	-	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		TP13_0.1	17/11/2018	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		TP13_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.7		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.6		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		TP16_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP16_0.8		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.5		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP18_0.1		-	-	-	-	-	-	-	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		TP18_0.4		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP20_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		BH02_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH2_1.0		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH03_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH4_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH05_0.2-0.5		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_ASB1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	TP12_0.2	QA200		<5	<5	<5	-	-	<0.5	<5	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1
	TP16_0.1	QA300	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.1	QA400		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary

Maximum Concentration	<5	<5	<5	<0.5	<0.5	<0.5	<5	<0.05	<0.05	<0.2	<0.2	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Average Concentration	<5	<5	<5	<0.5	<0.5	<0.5	<5	<0.05	<0.05	<0.2	<0.2	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Standard Deviation	1		1	0	0	0				0	0		0	0	0	0	0	0	0	0

SPOCAS SOIL ANALYTICAL SUMMARY
Kyeemagh Infant School
Project: 59918157

DWP Australa
Kyeemagh NSW

Location	Depth (m)	Date Sampled	Filling (F) / Natural (N)	Material Type	pH_F	pH_{FOX}	pH_F - pH_{FOX}	Reaction Rate	pH kcl	Peroxide pH	TPA	TSA	Peroxide Oxidisable Sulfur	Chromium Reducible Sulfur	Acid Neutralising Capacity	Acid Trail	Net Acidity	Liming rate
					pH units	pH units	pH units		pH units	pH Units	mol H+/t	mol H+/t	%S	%S	%S	TAA Mole H+/t	%S	kg $CaCO_3$/t
BH01_1.0-1.45	1.0-1.45	10/11/2018	F	Silty Sand	6.4	4.2	2.2	1	5.8	4.8	<2	<0.02	<0.02	<0.005	n/a	3	<0.02	<1
BH01_2.5-2.95	2.5-2.95	10/11/2018	N	Silty Sand	6.3	4.8	1.5	1	-	-	-	-	-	-	-	-	-	-
BH01_3.0-3.45	3.0-3.45	10/11/2018	N	Silty Sand	7.1	5.7	1.4	1	-	-	-	-	-	-	-	-	-	-
BH01_4.0-4.45	4.0-4.45	10/11/2018	N	Silty Sand	6.7	5	1.7	1	-	-	-	-	-	-	-	-	-	-
BH01_5.5-5.95	5.0-5.95	10/11/2018	N	Sand	9.2	7.7	1.5	1	-	-	-	-	-	-	-	-	-	-
BH01_7.0-7.45	7.0-7.45	10/11/2018	N	Silty Clay	9	5.1	3.9	2	-	-	-	-	-	-	-	-	-	-
BH01_8.5-8.95	8.5-8.95	10/11/2018	N	Sandy Clay	8.9	4.2	4.7	3	9	7.3	<2	<2	0.4	0.34	0.90	<2	<0.02	<1
BH01_10.0-10.45	10.0-10.45	10/11/2018	N	Clayey Sand	9.2	4.3	4.9	3	9.2	7	<2	<2	0.15	0.16	0.40	<2	<0.02	<1
BH01_11.0-11.45	11.0-11.45	10/11/2018	N	Clayey Sand	8.5	7.1	1.4	1	-	-	-	-	-	-	-	-	-	-
BH01_13.0-13.45	13.0-13.45	10/11/2018	N	Sand	8.3	5.2	3.1	4	-	-	-	-	-	-	-	-	-	-
BH01_14.5-14.95	14.5-14.95	10/11/2018	N	Sand	8.2	5.8	2.4	1	-	-	-	-	-	-	-	-	-	-
BH01_16.0-16.45	16.0-16.45	10/11/2018	N	Sand	6.9	3.1	3.8	2	5.5	4.4	47	40	0.07	0.05	n/a	7	0.06	2.9
BH02_2.0-2.45	2.0-2.45	17/11/2018	N	Silty Sand	7.8	6.1	1.7	1	-	-	-	-	-	-	-	-	-	-
BH02_4.0-4.45	4.0-4.45	17/11/2018	N	Sand	6.8	5.2	1.6	1	5.9	7.2	<2	<2	0.24	<0.005	n/a	<2	<0.02	<1
BH02_5.5-5.95	5.5-5.95	17/11/2018	N	Sand	9.6	7.5	2.1	1	-	-	-	-	-	-	-	-	-	-
BH02_7.0-7.45	7.0-7.45	17/11/2018	N	Sand	8.8	6.2	2.6	4	9.1	7.2	<2	<2	0.06	0.13	0.56	<2	<0.02	<1
BH02_8.5-8.95	8.5-8.95	17/11/2018	N	Sandy Clay	8.6	5.9	2.7	4	-	-	-	-	-	-	-	-	-	-
BH02_10.0-10.45	10.0-10.45	17/11/2018	N	Sandy Clay	9.1	5.1	4	4	-	-	-	-	-	-	-	-	-	-
BH02_11.5-11.95	11.5-11.95	17/11/2018	N	Sandy Clay	9	4.5	4.5	4	9.3	7.4	<2	<2	0.09	0.082	0.31	<2	<0.02	<1
BH02_13.0-13.45	13.0-13.45	17/11/2018	N	Sandy Clay	8.2	7.9	0.3	4	-	-	-	-	-	-	-	-	-	-
BH02_14.5-14.95	14.5-14.95	17/11/2018	N	Sand	8.8	6.7	2.1	1	-	-	-	-	-	-	-	-	-	-
BH02_16.0-16.45	16.0-16.45	17/11/2018	N	Sandy Clay	6.9	6.4	0.5	4	-	-	-	-	-	-	-	-	-	-
BH02_17.5-17.95	17.5-17.95	17/11/2018	N	Clayey Sand	6.2	5.6	0.6	4	-	-	-	-	-	-	-	-	-	-
Guideline Value				**Eurofins LOR**	-	-	-	-	0.1	0.1	2	2	0.02	0.005	0.02	2	0.02	1
ASSMAC (1998) Potential Acid Sulfate Soil Indicator Value					4 - 5.5 [1]	< 4[3]	1 [4]	-	-	-				-	-	-	-	-
ASSMAC (1998) Actual Acid Sulfate Soil Indicator Value					≤ 4 [2]	-	-	-	-	-				-	-	-	-	-
ASSMAC (1998) Action Criteria - Coarse Soils (1 - 1000 tonnes) 5					-	-	-	-	-	-	18	18	0.03	0.03	-	18	0.03	-
ASSMAC (1998) Action Criteria - Medium Soils (1 - 1000 tonnes) [6]					-	-	-	-	-	-	36	36	0.06	0.06	-	36	0.06	-
ASSMAC (1998) Action Criteria - Fine Soils (1 - 1000 tonnes) [7]					-	-	-	-	-	-	62	62	0.10	0.10	-	62	0.10	-
ASSMAC (1998) Action Criteria - Coarse Soils (>1000 tonnes) 5					-	-	-	-	-	-	18	18	0.03	0.03	-	18	0.03	-
ASSMAC (1998) Action Criteria - Medium Soils (>1000 tonnes) [6]					-	-	-	-	-	-	18	18	0.03	0.03	-	18	0.03	-
ASSMAC (1998) Action Criteria - Fine Soils (>1000 tonnes) [7]					-	-	-	-	-	-	18	18	0.03	0.03	-	18	0.03	-

Notes to Table:

1 - pH values >4 and <5.5 are acid and may be the result of some previous or limited oxidation of sulfides, but is not confirmatory of actual acid sulfate soils

2 - pH readings of pH≤4, indicates that actual acid sulfate soils are present with the sulfides having been oxidized in the past, resulting in acid soils (and soil pore water)
3 - The lower the final pH_{FOX} value is, the better the indication of a positive result.
» If the pH_{FOX} < 3 and there was a strong reaction to the peroxide, there is a high level of certainty of a potential acid sulfate soils. The more the pH_{FOX} drops below 3, the more positive the presence of sulfides.
» A pH_{FOX} 3-4 is less positive and laboratory analyses are needed to confirm if sulfides are present.
» For pH_{FOX} 4-5 the test is neither positive nor negative. Sulfides may be present either in small quantities and be poorly reactive under quick test field conditions.
» For pH_{FOX} >5 and little or no drop in pH from the field value, little net acid generating ability is indicated.

4 - If the pH_F value is at least one unit below field pH_{FOX}, it may indicate potential acid sulfate soils. The greater the difference between the two measurements, the more indicative the value is of a potential acid sulfate soils.

5 - coarse soils comprise sands to loamy sands - Approximate clay content (% < 0.002mm) ≤ 5%
6 - Medium soils comprise sandy loams to light clays - Approximate clay content (% < 0.002mm) between 5 and 40%
7 - Fine soils comprise medium to heavy clays and silty clays - Approximate clay content (% < 0.002mm) ≥ 40%
8 - NT - Not Tested

9 - 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Liming Rate: A Safety Factor of 1.5 has been incorporated to account for the mixing process

Acid Trail / Net Acidity - Indicates acidic soils, however may not indicate Acid Sulfate Soils

Contaminant Exceedance Indicators:

Bold	Indicates the laboratory result is within the specified range of the ASSMAC (1998) Actual Acid Sulfate Soil Indicator Values
Italics	Indicates the laboratory result either exceeds or is within the specified range of the ASSMAC (1998) Potential Acid Sulfate Soil Indicator Values
🟩	Indicates exceedance of the ASSMAC (1998) Action Criteria triggering the need to prepare a ASS Management Plan
🟨	Indicates the requirement for localised lime treatment of the material, that is, when the laboratory results for SCr (%w/w) > 0.03 and the SCr (mole H=/t) > 18

SPOCAS SOIL ANALYTICAL SUMMARY
Kyeemagh Infant School
Project: 59918157

DWP Australia
Kyeemagh NSW

Location	Depth (m)	Date Sampled	Filling (F) / Natural (N)	Material Type	pH_F	pH_{FOX}	pH_F - pH_{FOX}	Reaction Rate	pH kcl	Peroxide pH	TPA	TSA	Peroxide Oxidisable Sulfur	Chromium Reducible Sulfur	Acid Neutralising Capacity	Acid Trail	Net Acidity	Liming rate
					pH units	pH units	pH units		pH units	pH Units	mol H+/t	mol H+/t	%S	%S	%S	TAA Mole H+/t	%S	kg $CaCO_3$/t
BH03_1.0-1.1	1.0-1.1	17/11/2018	F	Sand	6.4	5	1.4	1	-	-	-	-	-	-	-	-	-	-
BH03_2.5-2.95	2.5-2.95	17/11/2018	N	Sand	6.8	5	1.8	2	-	-	-	-	-	-	-	-	-	-
BH03_4.0-4.45	4.0-4.45	17/11/2018	N	Sand	9.3	7.4	1.9	1	-	-	-	-	-	-	-	-	-	-
BH03_5.5-5.95	5.5-5.95	17/11/2018	N	Sand	9.4	7.5	1.9	1	-	-	-	-	-	-	-	-	-	-
BH03_7.0-7.45	7.0-7.45	17/11/2018	N	Sand	9	7	2	2	-	-	-	-	-	-	-	-	-	-
BH03_8.5-8.95	8.5-8.95	17/11/2018	N	Sandy Clay	9.1	6.2	2.9	4	9.3	7.5	<2	<2	0.35	0.29	1.00	<2	<0.02	<1
BH03_10.0-10.45	10.0-10.45	17/11/2018	N	Sandy Clay	8.9	2.3	6.6	4	8.2	2.6	210	210	0.48	0.35	0.24	<2	0.19	8.8
BH03_11.5-11.95	11.5-11.95	17/11/2018	N	Sand	8.1	4.4	3.7	2	-	-	-	-	-	-	-	-	-	-
BH03_13.0-13.45	13.0-13.45	17/11/2018	N	Sand	8.3	6.1	2.2	2	-	-	-	-	-	-	-	-	-	-
BH04_0.5-0.95	0.5-0.95	10/11/2018	F	Sand	6.2	3.9	2.3	1	6.7	4.9	<2	<2	<0.02	<0.005	0.09	<2	<0.02	<1
BH04_2.0-2.45	2.0-2.45	10/11/2018	N	Silty Sand	4.9	3.3	1.6	1	5.7	4.4	<2	<2	<0.02	<0.005	n/a	3	<0.02	<1
BH04_3.0-3.45	3.0-3.45	10/11/2018	N	Silty Sand	5.5	3.4	2.1	1	-	-	-	-	-	-	-	-	-	-
BH05_1.5-1.95	1.5-1.95	10/11/2018	N	Silty Sand	5.6	3.5	2.1	1	5.7	4.9	<2	<2	<0.02	<0.005	n/a	3	<0.02	<1
BH05_4.5-4.95	4.5-4.95	11/11/2018	N	Sand	6.5	5	1.5	1	-	-	-	-	-	-	-	-	-	-
Guideline Value				**Eurofins LOR**	-	-	-	-	0.1	0.1	2	2	0.02	0.005	0.02	2	0.02	1
ASSMAC (1998) Potential Acid Sulfate Soil Indicator Value					4 - 5.5 [1]	< 4[3]	1 [4]	-	-	-				-	-	-	-	-
ASSMAC (1998) Actual Acid Sulfate Soil Indicator Value					≤ 4 [2]	-	-	-	-	-				-	-	-	-	-
ASSMAC (1998) Action Criteria - Coarse Soils (1 - 1000 tonnes) 5					-	-	-	-	-	-	18	18	0.03	0.03	-	18	0.03	-
ASSMAC (1998) Action Criteria - Medium Soils (1 - 1000 tonnes) [6]					-	-	-	-	-	-	36	36	0.06	0.06	-	36	0.06	-
ASSMAC (1998) Action Criteria - Fine Soils (1 - 1000 tonnes) [7]					-	-	-	-	-	-	62	62	0.10	0.10	-	62	0.10	-
ASSMAC (1998) Action Criteria - Coarse Soils (>1000 tonnes) 5					-	-	-	-	-	-	18	18	0.03	0.03	-	18	0.03	-
ASSMAC (1998) Action Criteria - Medium Soils (>1000 tonnes) [6]					-	-	-	-	-	-	18	18	0.03	0.03	-	18	0.03	-
ASSMAC (1998) Action Criteria - Fine Soils (>1000 tonnes) [7]					-	-	-	-	-	-	18	18	0.03	0.03	-	18	0.03	-

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Soil Analytical Summary - Waste Classification
Kyeemagh Infants School
Project: 80818157

DWP Australia
Kyeemagh NSW

		BTEX							TPH					MAH									
		Benzene	**Toluene**	**Ethylbenzene**	**Xylene (m & p)**	**Xylene (o)**	**Total BTEX**	**Xylene Total**	**C6 - C9**	**C10 - C14**	**C15 - C28**	**C29-C36**	**+C10 - C36 (Sum of total)**	**Total MAH**	**1,2,4-trimethylbenzene**	**1,3,5-trimethylbenzene**	**Isopropylbenzene**	**n-butylbenzene**	**n-propylbenzene**	**p-isopropyltoluene**	**sec-butylbenzene**	**Styrene**	**tert-butylbenzene**
		mg/kg	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
EQL		0.1	0.1	0.1	0.2	0.1	0.2	0.3	10	20	50	50	50	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NSW 2014 General Solid Waste CT1 (No Leaching)		10	288	600				1,000	650				10,000									60	
NSW 2014 Restricted Solid Waste CT2 (No Leaching)		40	1,152	2,400				4,000	2,600				40,000									240	
NSW 2014 General Solid Waste SCC1 (with leached)		18	518	1,080				1,800	6500				10,000									108	
Field ID	**Date**																						
ASB2	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02_0.5	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
BH2_1.0	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
BH03_0.5	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
BH4_0.4	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	**370**	**1,600**	**1,970**	-	-	-	-	-	-	-	-	-	-
BH05_0.2-0.5	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP01_0.2	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	**62**	**62**	-	-	-	-	-	-	-	-	-	-
TP01_0.9	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP02_0.1	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	**63**	**110**	**173**	-	-	-	-	-	-	-	-	-	-
TP02_0.4	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP03_0.2	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP03_1.2	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP03_ASB1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04_0.1	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP04_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.1	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP05_0.9	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP06_0.1	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	**100**	**480**	**580**	-	-	-	-	-	-	-	-	-	-
TP06_0.3	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP07_0.1	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP07_0.4	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP07_0.6	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP08_0.4	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP09_0.3	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP10_0.1	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	**91**	**91**	-	-	-	-	-	-	-	-	-	-
TP11_0.2	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP11_1.2	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	**72**	**92**	**164**	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP12_0.2	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP13_0.1	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	**70**	**290**	**360**	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP13_0.4	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.7	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP15_0.1	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP15_0.6	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP16_0.1	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP16_0.8	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP17_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17_0.5	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP18_0.1	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP18_0.4	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP19_0.1	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP19_0.3	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP20_0.1	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
QA100	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
QA200	**10/11/2018**	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<10	<50	<100	<100	<50	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QA300	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
QA400	**17/11/2018**	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<10	<50	<100	<100	<50	-	-	-	-	-	-	-	-	-	-
Statistics																							
Number of Results		**43**	**43**	**43**	**43**	**43**	**2**	**43**	**41**	**41**	**41**	**41**	**41**	**14**	**15**	**15**	**15**	**1**	**1**	**1**	**1**	**15**	**1**
Minimum Concentration		**<0.1**	**<0.1**	**<0.1**	**<0.2**	**<0.1**	**<0.2**	**<0.3**	**<10**	**<20**	**<50**	**<50**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
Maximum Concentration		**83**	**82**	**82**	**83**	**84**	**<0.2**	**84**	**<20**	**<50**	**370**	**1,600**	**1,970**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
Average Concentration *		**2**	**2**	**2**	**2**	**2**	**0.1**	**2.1**	**9.8**	**11**	**40**	**88**	**104**	**0.25**	**0.25**	**0.25**	**0.25**					**0.25**	
Standard Deviation *		**13**	**12**	**12**	**13**	**13**	**0**	**13**	**1.1**	**3.3**	**55**	**256**	**316**	**0**	**0**	**0**	**0**					**0**	

* A Non Detect Multiplier of 0.5 has been applied.

Soil Analytical Summary - Waste Classification
Kyeemagh Infants School
Project: 80818157

DWP Australia
Kyeemagh NSW

		PAH																				Asbestos		
		BaP TEQ (zero)	Benzo(a)pyrene TEQ (half LOR)_	Benzo(a)pyrene TEQ (upper bound) *	Benzo(b+j)fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Sum of total)	Phenanthrene	Pyrene	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil	Asbestos Reported Result
		mg/kg	mg/kg	MG/KG	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%w/w	%w/w	Comment
EQL		0.5	0.5		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5			
NSW 2014 General Solid Waste CT1 (No Leaching)										0.8									200					
NSW 2014 Restricted Solid Waste CT2 (No Leaching)										3.2									800					
NSW 2014 General Solid Waste SCC1 (with leached)										10														
Field ID	**Date**																							
ASB2	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**Y**
BH02_0.5	**17/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
BH2_1.0	**17/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
BH03_0.5	**17/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
BH4_0.4	**10/11/2018**	**1.0**	**1.3**	**1.7**	**0.6**	<0.5	<0.5	<0.5	<0.5	**0.9**	<0.5	**0.8**	<0.5	<0.5	**0.6**	<0.5	<0.5	<0.5	**3.4**	<0.5	**0.5**	-	-	-
BH05_0.2-0.5	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP01_0.2	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP01_0.9	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP02_0.1	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP02_0.4	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP03_0.2	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP03_1.2	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP03_ASB1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**Y**
TP04_0.1	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP04_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.1908**	<0.001	Y
TP05_0.1	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP05_0.9	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP06_0.1	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP06_0.3	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP07_0.1	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP07_0.4	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP07_0.6	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP08_0.4	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP09_0.3	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP10_0.1	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP11_0.2	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP11_1.2	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP12_0.2	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP13_0.1	**17/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP13_0.4	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	N
TP14_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	N
TP14_0.7	**17/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP15_0.1	**17/11/2018**	**0.9**	**1.2**	**1.5**	<0.5	<0.5	<0.5	<0.5	**1.1**	**0.7**	<0.5	**0.7**	**1.0**	<0.5	**1.3**	<0.5	<0.5	<0.5	**6.9**	**0.8**	**1.3**	-	-	-
TP15_0.6	**17/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP16_0.1	**17/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP16_0.8	**17/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP17_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	N
TP17_0.5	**17/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP18_0.1	**17/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP18_0.4	**17/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP19_0.1	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP19_0.3	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP20_0.1	**17/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
QA100	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
QA200	**10/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
QA300	**17/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
QA400	**17/11/2018**	<0.5	**0.6**	**1.2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Statistics																								
Number of Results		**41**	**41**	**39**	**41**	**41**	**41**	**41**	**41**	**41**	**41**	**41**	**41**	**41**	**41**	**41**	**41**	**83**	**41**	**41**	**41**	**25**	**25**	**25**
Minimum Concentration		**<0.5**	**0.6**	**1.2**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**0.5**	**0**	**0**	**1**
Maximum Concentration		**1**	**1.3**	**1.7**	**0.6**	**<0.5**	**<0.5**	**<0.5**	**1.1**	**0.9**	**<0.5**	**0.8**	**1**	**<0.5**	**1.3**	**<0.5**	**<0.5**	**<1**	**6.9**	**0.8**	**1.3**	**0.1908**	**0**	**1**
Average Concentration *		**0.28**	**0.63**	**1.2**	**0.26**	**0.25**	**0.25**	**0.25**	**0.27**	**0.28**	**0.25**	**0.27**	**0.27**	**0.25**	**0.28**	**0.25**	**0.25**	**0.26**	**0.49**	**0.26**	**0.28**	**0.0076**	**0**	**1**
Standard Deviation *		**0.15**	**0.14**	**0.092**	**0.055**	**0**	**0**	**0**	**0.13**	**0.12**	**0**	**0.11**	**0.12**	**0**	**0.17**	**0**	**0**	**0.032**	**1.1**	**0.086**	**0.17**	**0.038**	**0**	**0**

* A Non Detect Multiplier of 0.5 has been applied.

Soil Analytical Summary - Waste Classification
Kyeemagh Infants School
Project: 80818157

DWP Australia
Kyeemagh NSW

		Metals									VOCs			SVOCs												
		Arsenic	Cadmium	Chromium (III+VI)	Copper	Iron	Lead	Mercury	Nickel	Zinc	cis-1,4-Dichloro-2-butene	Pentachloroethane	trans-1,4-Dichloro-2-butene	EPN	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		2	0.4	2	5	20	5	0.1	2	5	0.5	0.5	0.5	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NSW 2014 General Solid Waste CT1 (No Leaching)		100	20	100			100	4	40						200	600	26	24		14				10		
NSW 2014 Restricted Solid Waste CT2 (No Leaching)		400	80	400			400	16	160						800	2,400	104	96		56				40		
NSW 2014 General Solid Waste SCC1 (with leached)		500	100	1,900			1,500	50	1,050						360	1,080	46.8	43.2		0.7				0.5		
Field ID	Date																									
ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02_0.5	17/11/2018	<2	<0.4	<5	<5	-	9.8	<0.1	<5	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2_1.0	17/11/2018	<2	<0.4	<5	5.6	-	12	<0.1	<5	24	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
BH03_0.5	17/11/2018	<2	<0.4	<5	<5	-	7.0	<0.1	<5	6.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4_0.4	10/11/2018	<2	<0.4	<5	11	-	13	<0.1	13	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05_0.2-0.5	10/11/2018	<2	<0.4	<5	<5	-	<5	<0.1	<5	<5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP01_0.2	10/11/2018	<2	<0.4	8.8	27	-	19	<0.1	15	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01_0.9	10/11/2018	<2	<0.4	<5	<5	-	18	<0.1	<5	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP02_0.1	10/11/2018	<2	<0.4	18	9.4	-	35	0.7	15	72	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
TP02_0.4	10/11/2018	<2	<0.4	10	6.8	-	8.1	<0.1	9.6	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03_0.2	10/11/2018	<2	<0.4	<5	6.6	-	19	<0.1	<5	35	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
TP03_1.2	10/11/2018	<2	<0.4	<5	<5	-	6.2	<0.1	<5	11	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP03_ASB1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04_0.1	10/11/2018	<2	<0.4	<5	8.7	-	38	<0.1	<5	36	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
TP04_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.1	10/11/2018	<2	<0.4	<5	5.2	-	23	<0.1	<5	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.9	10/11/2018	<2	<0.4	<5	<5	360	<5	<0.1	<5	<5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP06_0.1	10/11/2018	2.8	<0.4	130	37	-	8.1	<0.1	130	86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06_0.3	10/11/2018	<2	<0.4	13	16	-	11	<0.1	17	26	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP07_0.1	10/11/2018	2.5	<0.4	6.4	8.4	-	17	1.5	<5	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.4	10/11/2018	<2	<0.4	<5	<5	1,500	11	0.2	<5	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.6	10/11/2018	<2	<0.4	<5	13	-	9.0	0.7	<5	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP08_0.4	10/11/2018	<2	<0.4	<5	<5	-	7.3	<0.1	<5	10	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP09_0.3	10/11/2018	<2	<0.4	<5	<5	-	10	<0.1	<5	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP10_0.1	10/11/2018	<2	<0.4	<5	<5	-	10	<0.1	<5	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11_0.2	10/11/2018	<2	<0.4	<5	<5	-	<5	<0.1	<5	<5	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
TP11_1.2	10/11/2018	<2	<0.4	<5	<5	-	19	<0.1	<5	12	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP12_0.2	10/11/2018	<2	<0.4	<5	<5	630	13	<0.1	<5	17	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
TP13_0.1	17/11/2018	<2	<0.4	32	12	-	11	<0.1	30	40	-	-	-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP13_0.4	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.7	17/11/2018	<2	<0.4	<5	<5	-	<5	<0.1	<5	<5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP15_0.1	17/11/2018	<2	<0.4	<5	16	-	65	0.1	<5	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15_0.6	17/11/2018	<2	<0.4	<5	<5	-	<5	<0.1	<5	120	-	-	-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP16_0.1	17/11/2018	<2	<0.4	<5	<5	-	17	<0.1	<5	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP16_0.8	17/11/2018	<2	<0.4	<5	<5	-	5.1	<0.1	<5	8.3	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP17_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17_0.5	17/11/2018	<2	<0.4	<5	<5	-	<5	<0.1	<5	<5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP18_0.1	17/11/2018	<2	<0.4	<5	11	-	56	<0.1	<5	130	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
TP18_0.4	17/11/2018	<2	<0.4	<5	<5	-	<5	<0.1	<5	<5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP19_0.1	10/11/2018	<2	<0.4	<5	7.3	-	32	<0.1	<5	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19_0.3	10/11/2018	<2	<0.4	<5	10	-	10	<0.1	<5	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP20_0.1	17/11/2018	<2	<0.4	5.3	12	-	42	<0.1	<5	66	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
QA100	10/11/2018	<2	<0.4	<5	11	-	14	<0.1	<5	15	-	-	-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
QA200	10/11/2018	<5	<1	<2	<5	-	8	<0.1	<2	10	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QA300	17/11/2018	<2	<0.4	<5	5.2	-	19	<0.1	<5	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA400	17/11/2018	<5	<1	<2	5	-	21	<0.1	<2	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistics

Number of Results	**41**	**41**	**41**	**41**	**3**	**41**	**41**	**41**	**41**	**1**	**1**	**1**	**10**	**15**	**15**	**15**	**15**	**15**	**15**	**1**	**15**	**1**	**15**	**15**	**15**
Minimum Concentration	**<2**	**<0.4**	**<2**	**5**	**360**	**<5**	**0.1**	**<2**	**<5**	**<0.5**	**<0.5**	**<0.5**	**<0.2**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
Maximum Concentration	**<5**	**<1**	**130**	**37**	**1,500**	**65**	**1.5**	**130**	**130**	**<0.5**	**<0.5**	**<0.5**	**<0.2**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
Average Concentration *	**1.2**	**0.21**	**7.4**	**7.2**	**830**	**16**	**0.12**	**7.6**	**29**				**0.1**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**		**0.25**		**0.25**	**0.25**	**0.25**
Standard Deviation *	**0.47**	**0.065**	**20**	**7.1**	**596**	**14**	**0.26**	**20**	**29**				**0**	**0**	**0**	**0**	**0**	**0**	**0**		**0**		**0**	**0**	**0**

* A Non Detect Multiplier of 0.5 has been applied.

		Chlorinated Hydrocarbons																		
		2,2-dichloropropane	Bromochloromethane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Dibromomethane	Dichloromethane	Hexachlorobutadiene	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NSW 2014 General Solid Waste CT1 (No Leaching)						10			120					172		10	14			4
NSW 2014 Restricted Solid Waste CT2 (No Leaching)						40			480					688		40	56			16
NSW 2014 General Solid Waste SCC1 (with leached)						18			126					8.6		18	25.2			7.2
Field ID	**Date**																			
ASB2	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02_0.5	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2_1.0	**17/11/2018**	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
BH03_0.5	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05_0.2-0.5	**10/11/2018**	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP01_0.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01_0.9	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP02_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP02_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03_0.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03_1.2	**10/11/2018**	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP03_ASB1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.9	**10/11/2018**	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP06_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06_0.3	**10/11/2018**	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP07_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.6	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP08_0.4	**10/11/2018**	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP09_0.3	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP10_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11_0.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11_1.2	**10/11/2018**	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP12_0.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP13_0.1	**17/11/2018**	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP13_0.4	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.7	**17/11/2018**	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP15_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15_0.6	**17/11/2018**	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP16_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP16_0.8	**17/11/2018**	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP17_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17_0.5	**17/11/2018**	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP18_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP18_0.4	**17/11/2018**	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP19_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19_0.3	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP20_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA100	**10/11/2018**	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
QA200	**10/11/2018**	<0.5	-	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5
QA300	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA400	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Statistics																				
Number of Results		**1**	**14**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**14**	**1**	**15**	**15**	**15**	**15**	**15**
Minimum Concentration		**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
Maximum Concentration		**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<5**	**<0.5**	**<5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<5**
Average Concentration *			**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.4**	**0.25**	**0.4**	**0.25**	**0.25**	**0.25**	**0.25**		**0.25**	**0.25**	**0.25**	**0.25**	**0.4**
Standard Deviation *			**0**	**0**	**0**	**0**	**0**	**0.58**	**0**	**0.58**	**0**	**0**	**0**	**0**		**0**	**0**	**0**	**0**	**0.58**

* A Non Detect Multiplier of 0.5 has been applied.

Cardno

Soil Analytical Summary - Waste Classification
Kyeemagh Infants School
Project: 80818157

DWP Australia
Kyeemagh NSW

		Halogenated Hydrocarbons																						
		1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dibromoethane	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Bromomethane	Chlorobenzene	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
NSW 2014 General Solid Waste CT1 (No Leaching)					86		150					2,000												
NSW 2014 Restricted Solid Waste CT2 (No Leaching)					344		600					8,000												
NSW 2014 General Solid Waste SCC1 (with leached)					4.3		7.5					3,600												
Field ID	**Date**																							
ASB2	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02_0.5	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2_1.0	**17/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
BH03_0.5	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05_0.2-0.5	**10/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
TP01_0.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01_0.9	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP02_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.06**	<0.05	<0.05	**0.64**	<0.05	**0.7**	-	-	<0.05
TP02_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03_0.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05
TP03_1.2	**10/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
TP03_ASB1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05
TP04_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.9	**10/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
TP06_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06_0.3	**10/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
TP07_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.6	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP08_0.4	**10/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
TP09_0.3	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP10_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11_0.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05
TP11_1.2	**10/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
TP12_0.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05
TP13_0.1	**17/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05
TP13_0.4	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.7	**17/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
TP15_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15_0.6	**17/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05
TP16_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP16_0.8	**17/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
TP17_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17_0.5	**17/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
TP18_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	**0.05**	<0.05	<0.1	-	-	<0.05
TP18_0.4	**17/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
TP19_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19_0.3	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP20_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05
QA100	**10/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05
QA200	**10/11/2018**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<5	<0.5	<5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
QA300	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA400	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistics

Number of Results	**1**	**1**	**15**	**15**	**15**	**15**	**1**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**11**	**11**	**11**	**11**	**11**	**11**	**1**	**1**	**11**
Minimum Concentration	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.05**	**<0.05**	**<0.05**	**0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**
Maximum Concentration	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<5**	**<0.5**	**<5**	**<0.5**	**<5**	**0.06**	**<0.05**	**<0.05**	**0.64**	**<0.05**	**0.7**	**<0.05**	**<0.05**	**<0.05**
Average Concentration *			**0.25**	**0.25**	**0.25**	**0.25**		**0.25**	**0.25**	**0.4**	**0.25**	**0.4**	**0.25**	**0.4**	**0.028**	**0.025**	**0.025**	**0.083**	**0.025**	**0.11**			**0.025**
Standard Deviation *			**0**	**0**	**0**	**0**		**0**	**0**	**0.58**	**0**	**0.58**	**0**	**0.58**	**0.011**	**0**	**0**	**0.18**	**0**	**0.2**			**0**

* A Non Detect Multiplier of 0.5 has been applied.

		Organochlorine Pesticides																							
		DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene	Azinophos methyl	Bolstar (Sulprofos)	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	1	0.05	0.2	0.05	0.05	0.05	0.05	0.05
NSW 2014 General Solid Waste CT1 (No Leaching)						60	60	60	60															4	
NSW 2014 Restricted Solid Waste CT2 (No Leaching)						240	240	240	240															16	
NSW 2014 General Solid Waste SCC1 (with leached)						3|108	108	108	108															7.5	
Field ID	**Date**																								
ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02_0.5	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2_1.0	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03_0.5	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05_0.2-0.5	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01_0.2	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01_0.9	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP02_0.1	10/11/2018	<0.05	**0.06**	**0.12**	**0.64**	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	-	-	<0.2	<0.2	<0.2
TP02_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03_0.2	10/11/2018	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	-	-	<0.2	<0.2	<0.2
TP03_1.2	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03_ASB1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04_0.1	10/11/2018	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	-	-	<0.2	<0.2	<0.2
TP04_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.9	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06_0.3	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.6	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP08_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP09_0.3	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP10_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11_0.2	10/11/2018	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	-	-	<0.2	<0.2	<0.2
TP11_1.2	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP12_0.2	10/11/2018	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	-	-	<0.2	<0.2	<0.2
TP13_0.1	17/11/2018	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	-	-	<0.2	<0.2	<0.2
TP13_0.4	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.7	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15_0.6	17/11/2018	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	-	-	<0.2	<0.2	<0.2
TP16_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP16_0.8	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17_0.5	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP18_0.1	17/11/2018	<0.05	<0.05	<0.05	**0.05**	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	-	-	<0.2	<0.2	<0.2
TP18_0.4	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19_0.3	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP20_0.1	17/11/2018	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	-	-	<0.2	<0.2	<0.2
QA100	10/11/2018	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	-	-	<0.2	<0.2	<0.2
QA200	10/11/2018	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05
QA300	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA400	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Statistics																									
Number of Results		**11**	**11**	**11**	**11**	**1**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**10**	**11**	**10**	**1**	**1**	**11**	**11**	**11**
Minimum Concentration		**<0.05**	**<0.05**	**<0.05**	**0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<1**	**<0.05**	**<0.2**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**
Maximum Concentration		**<0.05**	**<0.2**	**0.12**	**0.64**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.2**	**<1**	**<0.2**	**<0.2**	**<0.05**	**<0.05**	**<0.2**	**<0.2**	**<0.2**
Average Concentration *		**0.025**	**0.035**	**0.034**	**0.083**		**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.032**	**0.5**	**0.093**	**0.1**			**0.093**	**0.093**	**0.093**
Standard Deviation *		**0**	**0.024**	**0.029**	**0.18**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.023**	**0**	**0.023**	**0**			**0.023**	**0.023**	**0.023**

* A Non Detect Multiplier of 0.5 has been applied.

Soil Analytical Summary - Waste Classification
Kyeemagh Infants School
Project: 80818157

DWP Australia
Kyeemagh NSW

		Organophosphorous Pesticides																								
		Coumaphos	**Demeton-O**	**Demeton-S**	**Diazinon**	**Dichlorvos**	**Dimethoate**	**Disulfoton**	**Ethion**	**Ethoprop**	**Fenitrothion**	**Fensulfothion**	**Fenthion**	**Malathion**	**Merphos**	**Methyl parathion**	**Mevinphos (Phosdrin)**	**Monocrotophos**	**Naled (Dibrom)**	**Omethoate**	**Phorate**	**Prothiofos**	**Pyrazophos**	**Ronnel**	**Terbufos**	**Trichloronate**
		mg/kg	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
EQL		2	0.2	0.2	0.05	0.05	0.05	0.2	0.05	0.2	0.2	0.2	0.05	0.05	0.2	0.2	0.2	0.2	0.2	2	0.2	0.05	0.2	0.2	0.2	0.2
NSW 2014 General Solid Waste CT1 (No Leaching)																										
NSW 2014 Restricted Solid Waste CT2 (No Leaching)																										
NSW 2014 General Solid Waste SCC1 (with leached)																										
Field ID	**Date**																									
ASB2	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02_0.5	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2_1.0	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03_0.5	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05_0.2-0.5	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01_0.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01_0.9	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP02_0.1	**10/11/2018**	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2
TP02_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03_0.2	**10/11/2018**	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2
TP03_1.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03_ASB1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04_0.1	**10/11/2018**	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2
TP04_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.9	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06_0.3	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.6	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP08_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP09_0.3	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP10_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11_0.2	**10/11/2018**	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2
TP11_1.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP12_0.2	**10/11/2018**	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2
TP13_0.1	**17/11/2018**	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2
TP13_0.4	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.7	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15_0.6	**17/11/2018**	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2
TP16_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP16_0.8	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17_0.5	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP18_0.1	**17/11/2018**	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2
TP18_0.4	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19_0.3	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP20_0.1	**17/11/2018**	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2
QA100	**10/11/2018**	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2
QA200	**10/11/2018**	-	-	-	<0.05	<0.05	<0.05	-	<0.05	-	-	-	<0.05	<0.05	-	<0.2	-	<0.2	-	-	-	<0.05	-	-	-	-
QA300	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA400	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistics

Number of Results	**10**	**10**	**10**	**11**	**11**	**11**	**10**	**11**	**10**	**10**	**10**	**11**	**11**	**10**	**11**	**10**	**11**	**10**	**10**	**10**	**1**	**10**	**10**	**10**	**10**
Minimum Concentration	**<2**	**<0.2**	**<0.2**	**<0.05**	**<0.05**	**<0.05**	**<0.2**	**<0.05**	**<0.2**	**<0.2**	**<0.2**	**<0.05**	**<0.05**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<2**	**<0.2**	**<0.05**	**<0.2**	**<0.2**	**<0.2**	**<0.2**
Maximum Concentration	**<2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<2**	**<0.2**	**<2**	**<0.2**	**<0.05**	**<0.2**	**<0.2**	**<0.2**	**<0.2**
Average Concentration *	**1**	**0.1**	**0.1**	**0.093**	**0.093**	**0.093**	**0.1**	**0.093**	**0.1**	**0.1**	**0.1**	**0.093**	**0.093**	**0.1**	**0.1**	**0.1**	**0.92**	**0.1**	**1**	**0.1**		**0.1**	**0.1**	**0.1**	**0.1**
Standard Deviation *	**0**	**0**	**0**	**0.023**	**0.023**	**0.023**	**0**	**0.023**	**0**	**0**	**0**	**0.023**	**0.023**	**0**	**0**	**0**	**0.27**	**0**	**0**	**0**		**0**	**0**	**0**	**0**

* A Non Detect Multiplier of 0.5 has been applied.

Cardno

Soil Analytical Summary - Waste Classification
Kyeemagh Infants School
Project: 80818157

DWP Australia
Kyeemagh NSW

			Solvents							Insecticides	Pesticides					Polychlorinated Biphenyls							
		Tetrachlorvinphos	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Acetone	Allyl chloride	Carbon disulfide	Vinyl acetate	Tokuthion	Demeton-S-methyl	Fenamiphos	Parathion	Pirimiphos-methyl	Pirimphos-ethyl	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Sum of total)
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.2	0.5	5	0.5	0.5	0.5	0.5	5	0.2	0.05	0.05	0.2	0.2	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NSW 2014 General Solid Waste CT1 (No Leaching)			4,000																				50
NSW 2014 Restricted Solid Waste CT2 (No Leaching)			16,000																				50
NSW 2014 General Solid Waste SCC1 (with leached)			7,200																				50
Field ID	**Date**																						
ASB2	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02_0.5	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2_1.0	**17/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03_0.5	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05_0.2-0.5	**10/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01_0.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01_0.9	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP02_0.1	**10/11/2018**	<0.2	-	-	-	-	-	-	-	<0.2	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP02_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03_0.2	**10/11/2018**	<0.2	-	-	-	-	-	-	-	<0.2	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP03_1.2	**10/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03_ASB1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04_0.1	**10/11/2018**	<0.2	-	-	-	-	-	-	-	<0.2	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP04_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.9	**10/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06_0.3	**10/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.6	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP08_0.4	**10/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP09_0.3	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP10_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11_0.2	**10/11/2018**	<0.2	-	-	-	-	-	-	-	<0.2	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP11_1.2	**10/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP12_0.2	**10/11/2018**	<0.2	-	-	-	-	-	-	-	<0.2	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP13_0.1	**17/11/2018**	<0.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.2	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP13_0.4	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.7	**17/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15_0.6	**17/11/2018**	<0.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.2	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP16_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP16_0.8	**17/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17_0.5	**17/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP18_0.1	**17/11/2018**	<0.2	-	-	-	-	-	-	-	<0.2	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP18_0.4	**17/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19_0.3	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP20_0.1	**17/11/2018**	<0.2	-	-	-	-	-	-	-	<0.2	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
QA100	**10/11/2018**	<0.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.2	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
QA200	**10/11/2018**	-	<5	<5	<5	-	-	<0.5	<5	-	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1
QA300	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA400	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Statistics																							
Number of Results		**10**	**15**	**1**	**15**	**14**	**14**	**15**	**1**	**10**	**1**	**1**	**11**	**10**	**1**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**11**
Minimum Concentration		**<0.2**	**<0.5**	**<5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<5**	**<0.2**	**<0.05**	**<0.05**	**<0.2**	**<0.2**	**<0.05**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**
Maximum Concentration		**<0.2**	**<5**	**<5**	**<5**	**<0.5**	**<0.5**	**<0.5**	**<5**	**<0.2**	**<0.05**	**<0.05**	**<0.2**	**<0.2**	**<0.05**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**
Average Concentration *		**0.1**	**0.4**		**0.4**	**0.25**	**0.25**	**0.25**		**0.1**			**0.1**	**0.1**		**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**
Standard Deviation *		**0**	**0.58**		**0.58**	**0**	**0**	**0**		**0**			**0**	**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

* A Non Detect Multiplier of 0.5 has been applied.

Groundwater Analytical Summary
Kyeemagh Infant School
Project: 80818157

DWP Architects
Pyrmont NSW

		BTEX						TRH				
		Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR		1	1	1	2	1	2	20	50	100	50	50
ANZECC 2000 Marine Water (90%)		900										
NEPM 2013 Table 1C GILs, Marine Waters		500										
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand												
2-4m		800										
4-8m		800										
>8m		900										
ANZECC 2000 Irrigation - Long-term trigger value												
PFAS NEMP 2018 Table 5 Interim marine 90%												

Field ID	Location	Sample Date	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)
MW01		**23/11/2018**	<1	<1	<1	<2	<1	<3	<20	<50	<100	<100	<100
MW02			<1	<1	<1	<2	<1	<3	<20	<50	<100	<100	<100
MW03			<1	<1	<1	<2	<1	<3	<20	<50	<100	<100	<100
QA100	**MW02**		<1	<1	<1	<2	<1	<3	<20	<50	<100	<100	<100
QA200	**MW02**		<1	<2	<2	<2	<2	<2	<20	<50	<100	<50	<50

Statistical Summary

	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)
Maximum Concentration	**<1**	**<2**	**<2**	**<2**	**<2**	**<3**	**<20**	**<50**	**<100**	**<100**	**<100**
Average Concentration *	**<1**	**<2**	**<2**	**<2**	**<2**	**<3**	**<20**	**<50**	**<100**	**<100**	**<100**
Standard Deviation *	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**11**

* A Non Detect Multiplier of 0.5 has been applied.

			CRC Care TRH Fractions							PAH				
			C6-C10	C10-C16	C16-C34	C34-C40	C10 - C40 (Sum of total)	F1: C6-C10 less BTEX	F2: >C10-C16 less Naphthalene	Benzo(b+j)fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR			20	50	100	100	100	20	50	1	1	1	1	1
ANZECC 2000 Marine Water (90%)														
NEPM 2013 Table 1C GILs, Marine Waters														
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand														
2-4m								1,000	1,000					
4-8m								1,000	1,000					
>8m								1,000	1,000					
ANZECC 2000 Irrigation - Long-term trigger value														
PFAS NEMP 2018 Table 5 Interim marine 90%														
Field ID	**Location**	**Sample Date**												
MW01		**23/11/2018**	<20	<50	<100	<100	<100	<20	<50	<1	<1	<1	<1	<1
MW02			<20	<50	<100	<100	<100	<20	<50	<1	<1	<1	<1	<1
MW03			<20	<50	<100	<100	<100	<20	<50	<1	<1	<1	<1	<1
QA100	**MW02**		<20	<50	<100	<100	<100	<20	<50	<1	<1	<1	<1	<1
QA200	**MW02**		<20	<100	<100	<100	<100	<20	<100	<1.0	<1.0	<1.0	<1.0	<1.0

Statistical Summary

Maximum Concentration	**<20**	**<100**	**<100**	**<100**	**<100**	**<20**	**<100**	**<1**	**<1**	**<1**	**<1**	**<1**
Average Concentration *	**<20**	**<100**	**<100**	**<100**	**<100**	**<20**	**<100**	**<1**	**<1**	**<1**	**<1**	**<1**
Standard Deviation *	**0**	**11**	**0**	**0**	**0**	**0**	**11**	**0**	**0**	**0**	**0**	**0**

* A Non Detect Multiplier of 0.5 has been applied.

	PAH												
	BaP TEQ (zero)	Benzo(a)pyrene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Sum of total)	Phenanthrene	Pyrene
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR	0.5	0.5	1	1	1	1	1	1	1	1	0.5	1	1
ANZECC 2000 Marine Water (90%)										90			
NEPM 2013 Table 1C GILs, Marine Waters										50			
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand													
2-4m													
4-8m													
>8m													
ANZECC 2000 Irrigation - Long-term trigger value													
PFAS NEMP 2018 Table 5 Interim marine 90%													

Field ID	Location	Sample Date	BaP TEQ (zero)	Benzo(a)pyrene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Sum of total)	Phenanthrene	Pyrene
MW01		**23/11/2018**		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW02				<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW03				<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
QA100	**MW02**			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
QA200	**MW02**		<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0

Statistical Summary

	BaP TEQ (zero)	Benzo(a)pyrene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Sum of total)	Phenanthrene	Pyrene
Maximum Concentration	**<0.5**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<10**	**<1**	**<1**	**<1**
Average Concentration *	**<0.6**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<10**	**<1**	**<1**	**<1**
Standard Deviation *		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

* A Non Detect Multiplier of 0.5 has been applied.

			Metals							
			Arsenic (filtered)	Cadmium (filtered)	Chromium (III+VI) (filtered)	Copper (filtered)	Lead (filtered)	Mercury (filtered)	Nickel (filtered)	Zinc (filtered)
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR			0.001	0.0001	0.001	0.001	0.001	0.0001	0.001	0.005
ANZECC 2000 Marine Water (90%)				0.014		0.003	0.0066	0.0007	0.2	0.023
NEPM 2013 Table 1C GILs, Marine Waters				0.0007		0.0013	0.0044	0.0001	0.007	0.015
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand										
2-4m										
4-8m										
>8m										
ANZECC 2000 Irrigation - Long-term trigger value			0.1	0.01	0.1	0.2	2	0.002	0.2	2
PFAS NEMP 2018 Table 5 Interim marine 90%										
Field ID	**Location**	**Sample Date**								
MW01		**23/11/2018**	<0.001	<0.0002	0.002	0.002	<0.001	<0.0001	<0.001	<0.005
MW02			<0.001	<0.0002	<0.001	<0.001	<0.001	<0.0001	0.001	<0.005
MW03			<0.001	<0.0002	0.002	0.001	<0.001	<0.0001	0.004	0.006
QA100	**MW02**		<0.001	<0.0002	<0.001	<0.001	<0.001	<0.0001	0.002	<0.005
QA200	**MW02**		<0.001	<0.0001	<0.001	0.001	<0.001	<0.0001	0.001	<0.005

Statistical Summary

Maximum Concentration	**<0.001**	**<0.0002**	**0.002**	**0.002**	**<0.001**	**<0.0001**	**0.004**	**0.006**
Average Concentration *	**<0.001**	**<0.0002**	**0.001**	**0.001**	**<0.001**	**<0.0001**	**0.002**	**0.003**
Standard Deviation *	**0**	**0**	**0.001**	**0.001**	**0**	**0**	**0.001**	**0.002**

* A Non Detect Multiplier of 0.5 has been applied.

			Perfluorocarbons								
			2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)
			mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR			5E-05	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01
ANZECC 2000 Marine Water (90%)											
NEPM 2013 Table 1C GILs, Marine Waters											
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand											
2-4m											
4-8m											
>8m											
ANZECC 2000 Irrigation - Long-term trigger value											
PFAS NEMP 2018 Table 5 Interim marine 90%								2			
Field ID	**Location**	**Sample Date**									
MW01		**23/11/2018**	<0.00005	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.05	<0.01
MW02			<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01
MW03			<0.00005	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.05	<0.01
QA100	**MW02**		<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01
QA200	**MW02**		<0.00005	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02

Statistical Summary

Maximum Concentration	**<5E-05**	**<0.02**	**<0.02**	**0.02**	**<0.02**	**<0.01**	**<0.02**	**<0.1**	**<0.02**
Average Concentration *	**<5E-06**	**<0.02**	**<0.02**	**0.01**	**<0.02**	**<0.01**	**<0.02**	**<0.1**	**<0.02**
Standard Deviation *	**0**	**0**	**0**	**0.01**	**0**	**0**	**0**	**0**	**0**

* A Non Detect Multiplier of 0.5 has been applied.

	Perfluorocarbons										
	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoate (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.05
ANZECC 2000 Marine Water (90%)											
NEPM 2013 Table 1C GILs, Marine Waters											
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand											
2-4m											
4-8m											
>8m											
ANZECC 2000 Irrigation - Long-term trigger value											
PFAS NEMP 2018 Table 5 Interim marine 90%			632								

Field ID	Location	Sample Date	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA
MW01		**23/11/2018**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05
MW02			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05
MW03			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05
QA100	**MW02**		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05
QA200	**MW02**		<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05

Statistical Summary

	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA
Maximum Concentration	**<0.02**	**<0.02**	**<0.01**	**<0.02**	**<0.02**	**<0.02**	**<0.02**	**<0.02**	**<0.05**	**<0.05**	**<0.05**
Average Concentration *	**<0.02**	**<0.02**	**<0.01**	**<0.02**	**<0.02**	**<0.02**	**<0.02**	**<0.02**	**<0.05**	**<0.05**	**<0.05**
Standard Deviation *	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

* A Non Detect Multiplier of 0.5 has been applied.

Groundwater Analytical Summary
Kyeemagh Infant School
Project: 80818157

DWP Architects
Pyrmont NSW

			Perfluorocarbons										
			N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FtS)	8:2 Fluorotelomer sulfonate (8:2 FtS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Sum of PFAS	Sum of PFAS (WA DER List)	Sum of PFHxS and PFOS
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR			0.05	0.05	0.02	0.02	0.01	0.05	0.01	0.01	0.01	0.01	0.01
ANZECC 2000 Marine Water (90%)													
NEPM 2013 Table 1C GILs, Marine Waters													
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand													
2-4m													
4-8m													
>8m													
ANZECC 2000 Irrigation - Long-term trigger value													
PFAS NEMP 2018 Table 5 Interim marine 90%													
Field ID	**Location**	**Sample Date**											
MW01		**23/11/2018**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	<0.05	0.02
MW02			<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	<0.05	<0.01
MW03			<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	<0.05	0.01
QA100	**MW02**		<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	<0.05	<0.01
QA200	**MW02**		<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01

Statistical Summary

Maximum Concentration	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.1**	**<0.05**	**0.02**
Average Concentration *	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.1**	**<0.05**	**1.02**
Standard Deviation *	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

* A Non Detect Multiplier of 0.5 has been applied.

	A	B	C	D	E	F	G	H	I	J	K	L
1	**UCL Statistics for Uncensored Full Data Sets**											
2												
3	User Selected Options			Kyeemagh Infants School: TRH C16-C34 85% UCL Excluding Hotspots								
4	Date/Time of Computation			ProUCL 5.112/12/2018 5:18:13 PM								
5	From File			627289, 628416, ES1833866, ES1834552								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10												
11	**C0**											
12												
13	**General Statistics**											
14	Total Number of Observations					31	Number of Distinct Observations					4
15							Number of Missing Observations					0
16	Minimum					100	Mean					114.5
17	Maximum					350	Median					100
18	SD					53.47	Std. Error of Mean					9.603
19	Coefficient of Variation					0.467	Skewness					3.901
20												
21	**Normal GOF Test**											
22	Shapiro Wilk Test Statistic					0.308	**Shapiro Wilk GOF Test**					
23	5% Shapiro Wilk Critical Value					0.929	Data Not Normal at 5% Significance Level					
24	Lilliefors Test Statistic					0.51	**Lilliefors GOF Test**					
25	5% Lilliefors Critical Value					0.156	Data Not Normal at 5% Significance Level					
26	**Data Not Normal at 5% Significance Level**											
27												
28	**Assuming Normal Distribution**											
29	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
30	95% Student's-t UCL					130.8	95% Adjusted-CLT UCL (Chen-1995)					137.5
31							95% Modified-t UCL (Johnson-1978)					131.9
32												
33	**Gamma GOF Test**											
34	A-D Test Statistic					10.01	**Anderson-Darling Gamma GOF Test**					
35	5% A-D Critical Value					0.746	Data Not Gamma Distributed at 5% Significance Level					
36	K-S Test Statistic					0.519	**Kolmogorov-Smirnov Gamma GOF Test**					
37	5% K-S Critical Value					0.158	Data Not Gamma Distributed at 5% Significance Level					
38	**Data Not Gamma Distributed at 5% Significance Level**											
39												
40	**Gamma Statistics**											
41	k hat (MLE)					9.316	k star (bias corrected MLE)					8.436
42	Theta hat (MLE)					12.29	Theta star (bias corrected MLE)					13.57
43	nu hat (MLE)					577.6	nu star (bias corrected)					523
44	MLE Mean (bias corrected)					114.5	MLE Sd (bias corrected)					39.43
45							Approximate Chi Square Value (0.05)					471
46	Adjusted Level of Significance					0.0413	Adjusted Chi Square Value					468.3
47												
48	**Assuming Gamma Distribution**											
49	95% Approximate Gamma UCL (use when n>=50))					127.2	95% Adjusted Gamma UCL (use when n<50)					127.9
50												

	A	B	C	D	E	F	G	H	I	J	K	L
51	**Lognormal GOF Test**											
52	Shapiro Wilk Test Statistic					0.322	**Shapiro Wilk Lognormal GOF Test**					
53	5% Shapiro Wilk Critical Value					0.929	Data Not Lognormal at 5% Significance Level					
54	Lilliefors Test Statistic					0.515	**Lilliefors Lognormal GOF Test**					
55	5% Lilliefors Critical Value					0.156	Data Not Lognormal at 5% Significance Level					
56	**Data Not Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59	Minimum of Logged Data					4.605	Mean of logged Data					4.686
60	Maximum of Logged Data					5.858	SD of logged Data					0.284
61												
62	**Assuming Lognormal Distribution**											
63	95% H-UCL					123.8	90% Chebyshev (MVUE) UCL					130.3
64	95% Chebyshev (MVUE) UCL					138.2	97.5% Chebyshev (MVUE) UCL					149.2
65	99% Chebyshev (MVUE) UCL					170.8						
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution (0.05)**											
69												
70	**Nonparametric Distribution Free UCLs**											
71	95% CLT UCL					130.3	95% Jackknife UCL					130.8
72	95% Standard Bootstrap UCL					N/A	95% Bootstrap-t UCL					N/A
73	95% Hall's Bootstrap UCL					N/A	95% Percentile Bootstrap UCL					N/A
74	95% BCA Bootstrap UCL					N/A						
75	90% Chebyshev(Mean, Sd) UCL					143.3	95% Chebyshev(Mean, Sd) UCL					156.4
76	97.5% Chebyshev(Mean, Sd) UCL					174.5	99% Chebyshev(Mean, Sd) UCL					210.1
77												
78	**Suggested UCL to Use**											
79	95% Student's-t UCL					130.8	or 95% Modified-t UCL					131.9
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	Recommendations are based upon data size, data distribution, and skewness.											
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
85												

1	**UCL Statistics for Uncensored Full Data Sets**			
2				
3	User Selected Options	Kyeemagh Infants School: Nickel 95% UCL Excluding Hotspots		
4	Date/Time of Computation	ProUCL 5.112/12/2018 3:11:33 PM		
5	From File	627289, 628416, ES1833866, ES1834552		
6	Full Precision	OFF		
7	Confidence Coefficient	95%		
8	Number of Bootstrap Operations	2000		
9				
10				
11	**C0**			
12				
13	**General Statistics**			
14	Total Number of Observations	30	Number of Distinct Observations	6
15			Number of Missing Observations	0
16	Minimum	2	Mean	6.287
17	Maximum	17	Median	5
18	SD	3.702	Std. Error of Mean	0.676
19	Coefficient of Variation	0.589	Skewness	1.955
20				
21	**Normal GOF Test**			
22	Shapiro Wilk Test Statistic	0.587	**Shapiro Wilk GOF Test**	
23	5% Shapiro Wilk Critical Value	0.927	Data Not Normal at 5% Significance Level	
24	Lilliefors Test Statistic	0.469	**Lilliefors GOF Test**	
25	5% Lilliefors Critical Value	0.159	Data Not Normal at 5% Significance Level	
26	**Data Not Normal at 5% Significance Level**			
27				
28	**Assuming Normal Distribution**			
29	**95% Normal UCL**		**95% UCLs (Adjusted for Skewness)**	
30	95% Student's-t UCL	7.435	95% Adjusted-CLT UCL (Chen-1995)	7.656
31			95% Modified-t UCL (Johnson-1978)	7.475
32				
33	**Gamma GOF Test**			
34	A-D Test Statistic	5.738	**Anderson-Darling Gamma GOF Test**	
35	5% A-D Critical Value	0.749	Data Not Gamma Distributed at 5% Significance Level	
36	K-S Test Statistic	0.447	**Kolmogorov-Smirnov Gamma GOF Test**	
37	5% K-S Critical Value	0.161	Data Not Gamma Distributed at 5% Significance Level	
38	**Data Not Gamma Distributed at 5% Significance Level**			
39				
40	**Gamma Statistics**			
41	k hat (MLE)	4.243	k star (bias corrected MLE)	3.841
42	Theta hat (MLE)	1.482	Theta star (bias corrected MLE)	1.637
43	nu hat (MLE)	254.6	nu star (bias corrected)	230.4
44	MLE Mean (bias corrected)	6.287	MLE Sd (bias corrected)	3.208
45			Approximate Chi Square Value (0.05)	196.3
46	Adjusted Level of Significance	0.041	Adjusted Chi Square Value	194.5
47				
48	**Assuming Gamma Distribution**			
49	95% Approximate Gamma UCL (use when n>=50))	7.38	95% Adjusted Gamma UCL (use when n<50)	7.449
50				

	A	B	C	D	E	F	G	H	I	J	K	L
51	**Lognormal GOF Test**											
52	Shapiro Wilk Test Statistic					0.672	**Shapiro Wilk Lognormal GOF Test**					
53	5% Shapiro Wilk Critical Value					0.927	Data Not Lognormal at 5% Significance Level					
54	Lilliefors Test Statistic					0.422	**Lilliefors Lognormal GOF Test**					
55	5% Lilliefors Critical Value					0.159	Data Not Lognormal at 5% Significance Level					
56	**Data Not Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59	Minimum of Logged Data					0.693					Mean of logged Data	1.716
60	Maximum of Logged Data					2.833					SD of logged Data	0.477
61												
62	**Assuming Lognormal Distribution**											
63	95% H-UCL					7.394					90% Chebyshev (MVUE) UCL	7.89
64	95% Chebyshev (MVUE) UCL					8.654					97.5% Chebyshev (MVUE) UCL	9.713
65	99% Chebyshev (MVUE) UCL					11.79						
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution (0.05)**											
69												
70	**Nonparametric Distribution Free UCLs**											
71	95% CLT UCL					7.398					95% Jackknife UCL	7.435
72	95% Standard Bootstrap UCL					7.375					95% Bootstrap-t UCL	7.903
73	95% Hall's Bootstrap UCL					7.467					95% Percentile Bootstrap UCL	7.387
74	95% BCA Bootstrap UCL					7.653						
75	90% Chebyshev(Mean, Sd) UCL					8.314					95% Chebyshev(Mean, Sd) UCL	9.233
76	97.5% Chebyshev(Mean, Sd) UCL					10.51					99% Chebyshev(Mean, Sd) UCL	13.01
77												
78	**Suggested UCL to Use**											
79	95% Student's-t UCL					7.435					or 95% Modified-t UCL	7.475
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	Recommendations are based upon data size, data distribution, and skewness.											
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
85												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Kyeemagh Infatns School: B(a)P In Fill Material 95% UCL
Date/Time of Computation	ProUCL 5.112/12/2018 3:16:45 PM
From File	627289, 628416, ES1833866, ES1834552
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

C0

General Statistics

Total Number of Observations	41	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	0.5	Mean	0.515
Maximum	0.9	Median	0.5
SD	0.0691	Std. Error of Mean	0.0108
Coefficient of Variation	0.134	Skewness	5.047

Normal GOF Test

Shapiro Wilk Test Statistic	0.235	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.941	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.535	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.137	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.533	95% Adjusted-CLT UCL (Chen-1995)	0.541
		95% Modified-t UCL (Johnson-1978)	0.534

Gamma GOF Test

A-D Test Statistic	14.49	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.747	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.538	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.137	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	79.47	k star (bias corrected MLE)	73.67
Theta hat (MLE)	0.00648	Theta star (bias corrected MLE)	0.00699
nu hat (MLE)	6516	nu star (bias corrected)	6041
MLE Mean (bias corrected)	0.515	MLE Sd (bias corrected)	0.06
		Approximate Chi Square Value (0.05)	5861
Adjusted Level of Significance	0.0441	Adjusted Chi Square Value	5855

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	0.53	95% Adjusted Gamma UCL (use when n<50)	0.531

	A	B	C	D	E	F	G	H	I	J	K	L
51	**Lognormal GOF Test**											
52	Shapiro Wilk Test Statistic					0.238	**Shapiro Wilk Lognormal GOF Test**					
53	5% Shapiro Wilk Critical Value					0.941	Data Not Lognormal at 5% Significance Level					
54	Lilliefors Test Statistic					0.537	**Lilliefors Lognormal GOF Test**					
55	5% Lilliefors Critical Value					0.137	Data Not Lognormal at 5% Significance Level					
56	**Data Not Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59	Minimum of Logged Data					-0.693	Mean of logged Data					-0.671
60	Maximum of Logged Data					-0.105	SD of logged Data					0.105
61												
62	**Assuming Lognormal Distribution**											
63	95% H-UCL					0.529	90% Chebyshev (MVUE) UCL					0.539
64	95% Chebyshev (MVUE) UCL					0.551	97.5% Chebyshev (MVUE) UCL					0.567
65	99% Chebyshev (MVUE) UCL					0.598						
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution (0.05)**											
69												
70	**Nonparametric Distribution Free UCLs**											
71	95% CLT UCL					0.532	95% Jackknife UCL					0.533
72	95% Standard Bootstrap UCL					N/A	95% Bootstrap-t UCL					N/A
73	95% Hall's Bootstrap UCL					N/A	95% Percentile Bootstrap UCL					N/A
74	95% BCA Bootstrap UCL					N/A						
75	90% Chebyshev(Mean, Sd) UCL					0.547	95% Chebyshev(Mean, Sd) UCL					0.562
76	97.5% Chebyshev(Mean, Sd) UCL					0.582	99% Chebyshev(Mean, Sd) UCL					0.622
77												
78	**Suggested UCL to Use**											
79	95% Student's-t UCL					0.533	or 95% Modified-t UCL					0.534
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	Recommendations are based upon data size, data distribution, and skewness.											
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
85												

	A	B	C	D	E	F	G	H	I	J	K	L
1	**UCL Statistics for Uncensored Full Data Sets**											
2												
3	User Selected Options			Kyeemagh Infants School: Chromium 95% UCL								
4	Date/Time of Computation			ProUCL 5.17/12/2018 11:50:02 AM								
5	From File			627289, 628416, ES1833866, ES1834552								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10												
11	**C0**											
12												
13	**General Statistics**											
14	Total Number of Observations					41	Number of Distinct Observations					10
15							Number of Missing Observations					0
16	Minimum					2	Mean					9.329
17	Maximum					130	Median					5
18	SD					19.92	Std. Error of Mean					3.112
19	Coefficient of Variation					2.136	Skewness					5.869
20												
21	**Normal GOF Test**											
22	Shapiro Wilk Test Statistic					0.267	**Shapiro Wilk GOF Test**					
23	5% Shapiro Wilk Critical Value					0.941	Data Not Normal at 5% Significance Level					
24	Lilliefors Test Statistic					0.412	**Lilliefors GOF Test**					
25	5% Lilliefors Critical Value					0.137	Data Not Normal at 5% Significance Level					
26	**Data Not Normal at 5% Significance Level**											
27												
28	**Assuming Normal Distribution**											
29	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
30	95% Student's-t UCL					14.57	95% Adjusted-CLT UCL (Chen-1995)					17.49
31							95% Modified-t UCL (Johnson-1978)					15.04
32												
33	**Gamma GOF Test**											
34	A-D Test Statistic					9.792	**Anderson-Darling Gamma GOF Test**					
35	5% A-D Critical Value					0.772	Data Not Gamma Distributed at 5% Significance Level					
36	K-S Test Statistic					0.434	**Kolmogorov-Smirnov Gamma GOF Test**					
37	5% K-S Critical Value					0.141	Data Not Gamma Distributed at 5% Significance Level					
38	**Data Not Gamma Distributed at 5% Significance Level**											
39												
40	**Gamma Statistics**											
41	k hat (MLE)					1.249	k star (bias corrected MLE)					1.174
42	Theta hat (MLE)					7.469	Theta star (bias corrected MLE)					7.947
43	nu hat (MLE)					102.4	nu star (bias corrected)					96.26
44	MLE Mean (bias corrected)					9.329	MLE Sd (bias corrected)					8.611
45							Approximate Chi Square Value (0.05)					74.63
46	Adjusted Level of Significance					0.0441	Adjusted Chi Square Value					73.93
47												
48	**Assuming Gamma Distribution**											
49	95% Approximate Gamma UCL (use when n>=50))					12.03	95% Adjusted Gamma UCL (use when n<50)					12.15
50												

51	**Lognormal GOF Test**			
52	Shapiro Wilk Test Statistic	0.561	**Shapiro Wilk Lognormal GOF Test**	
53	5% Shapiro Wilk Critical Value	0.941	Data Not Lognormal at 5% Significance Level	
54	Lilliefors Test Statistic	0.407	**Lilliefors Lognormal GOF Test**	
55	5% Lilliefors Critical Value	0.137	Data Not Lognormal at 5% Significance Level	
56	**Data Not Lognormal at 5% Significance Level**			
57				
58	**Lognormal Statistics**			
59	Minimum of Logged Data	0.693	Mean of logged Data	1.782
60	Maximum of Logged Data	4.868	SD of logged Data	0.67
61				
62	**Assuming Lognormal Distribution**			
63	95% H-UCL	9.218	90% Chebyshev (MVUE) UCL	9.897
64	95% Chebyshev (MVUE) UCL	11.03	97.5% Chebyshev (MVUE) UCL	12.61
65	99% Chebyshev (MVUE) UCL	15.71		
66				
67	**Nonparametric Distribution Free UCL Statistics**			
68	**Data do not follow a Discernible Distribution (0.05)**			
69				
70	**Nonparametric Distribution Free UCLs**			
71	95% CLT UCL	14.45	95% Jackknife UCL	14.57
72	95% Standard Bootstrap UCL	14.46	95% Bootstrap-t UCL	41.15
73	95% Hall's Bootstrap UCL	32.88	95% Percentile Bootstrap UCL	15.28
74	95% BCA Bootstrap UCL	18.87		
75	90% Chebyshev(Mean, Sd) UCL	18.66	95% Chebyshev(Mean, Sd) UCL	22.89
76	97.5% Chebyshev(Mean, Sd) UCL	28.76	99% Chebyshev(Mean, Sd) UCL	40.29
77				
78	**Suggested UCL to Use**			
79	95% Chebyshev (Mean, Sd) UCL	22.89		
80				
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
82	Recommendations are based upon data size, data distribution, and skewness.			
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
85				

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Kyeemagh Infants School: Fill material nickel 95% UCL
Date/Time of Computation	ProUCL 5.112/12/2018 3:01:43 PM
From File	627289, 628416, ES1833866, ES1834552
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

C0

General Statistics

Total Number of Observations	30	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	2	Mean	11.29
Maximum	130	Median	5
SD	23.13	Std. Error of Mean	4.222
Coefficient of Variation	2.049	Skewness	4.997

Normal GOF Test

Shapiro Wilk Test Statistic	0.331	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.927	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.374	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.159	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	18.46	95% Adjusted-CLT UCL (Chen-1995)	22.35
		95% Modified-t UCL (Johnson-1978)	19.1

Gamma GOF Test

A-D Test Statistic	5.446	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.774	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.421	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.165	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.063	k star (bias corrected MLE)	0.979
Theta hat (MLE)	10.62	Theta star (bias corrected MLE)	11.53
nu hat (MLE)	63.77	nu star (bias corrected)	58.72
MLE Mean (bias corrected)	11.29	MLE Sd (bias corrected)	11.41
		Approximate Chi Square Value (0.05)	42.11
Adjusted Level of Significance	0.041	Adjusted Chi Square Value	41.29

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	15.74	95% Adjusted Gamma UCL (use when n<50)	16.05

	A	B	C	D	E	F	G	H	I	J	K	L
51	**Lognormal GOF Test**											
52	Shapiro Wilk Test Statistic					0.688	**Shapiro Wilk Lognormal GOF Test**					
53	5% Shapiro Wilk Critical Value					0.927	Data Not Lognormal at 5% Significance Level					
54	Lilliefors Test Statistic					0.401	**Lilliefors Lognormal GOF Test**					
55	5% Lilliefors Critical Value					0.159	Data Not Lognormal at 5% Significance Level					
56	**Data Not Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59	Minimum of Logged Data					0.693	Mean of logged Data					1.884
60	Maximum of Logged Data					4.868	SD of logged Data					0.798
61												
62	**Assuming Lognormal Distribution**											
63	95% H-UCL					12.62	90% Chebyshev (MVUE) UCL					13.24
64	95% Chebyshev (MVUE) UCL					15.19	97.5% Chebyshev (MVUE) UCL					17.89
65	99% Chebyshev (MVUE) UCL					23.21						
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution (0.05)**											
69												
70	**Nonparametric Distribution Free UCLs**											
71	95% CLT UCL					18.23	95% Jackknife UCL					18.46
72	95% Standard Bootstrap UCL					18.16	95% Bootstrap-t UCL					45.5
73	95% Hall's Bootstrap UCL					42.57	95% Percentile Bootstrap UCL					19.42
74	95% BCA Bootstrap UCL					24.23						
75	90% Chebyshev(Mean, Sd) UCL					23.95	95% Chebyshev(Mean, Sd) UCL					29.69
76	97.5% Chebyshev(Mean, Sd) UCL					37.66	99% Chebyshev(Mean, Sd) UCL					53.3
77												
78	**Suggested UCL to Use**											
79	95% Chebyshev (Mean, Sd) UCL					29.69						
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	Recommendations are based upon data size, data distribution, and skewness.											
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
85												

APPENDIX

D

BOREHOLE LOGS

BOREHOLE LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: BH01
Job No: 5017190157
Sheet: 1 of 2

Position: E330215.509 N6241986.553 56 MGA94
Angle from Horizontal: 90°
Surface Elevation: 3.480 m AHD
Rig Type: Ute Mounted Drill Rig
Mounting: Light Vehicle
Driller: TR
Casing Diameter:
Contractor: Stratacore
Data Started: 10/11/18
Date Completed: 10/11/18
Logged By: DD
Checked By: JB

Drilling				Sampling & Testing			Material Description					
Method	Resistance	Casing	Water	Sample or Field Test	RL (m AHD)	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
AD/T	F-H					0.10m			Silty SAND: fine grained, grey, with organics			TOPSOIL
						0.30m			FILL: Gravelly SAND: fine grained, grey, fine to medium grained gravel			FILL
				SPT 1.00 - 1.45 m 4, 4, 6 N=10					Silty SAND: fine grained, grey yellow	D		MARINE
				SPT 2.50 - 2.95 m 5, 9, 15 N=24		2.20m		SP	Silty SAND: fine to medium grained, white yellow	M	MD to D	
WB			10/11/18	ES 4.00 - 4.45 m BH01 4.00-4.45 ASS SPT 4.00 - 4.45 m 8, 16, 26 N=42						W		
				5.50 - 5.95 m BH01 5.50-5.95 ASS SPT 5.50 - 5.95 m 17, 19, 19 N=38 7.00 - 7.45 m BH01 7.00-7.45 ASS SPT 7.00 - 7.45 m 5, 5, 3 N=8		5.50m		SP	SAND: fine to medium grained, pale grey, trace fine grained rounded gravel		D	
						7.38m		CI	Silty CLAY: medium plasticity, black, trace fine grained gravel, trace of shells		F to St	7.40 m: HP = 100 Kpa
				8.50 - 8.95 m BH01 8.50-8.95 ASS SPT 8.50 - 8.95 m 0, 0, 0 N=0		8.30m		CL-CI	Sandy CLAY: low to medium plasticity, black, fine grained sand, with shell fragments		VS to S	
						10.00m						

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽ Water Level on Date shown
► water inflow
◄ water outflow

FIELD TESTS

SPT	Standard Penetration Test
HP	Hand/Pocket Penetrometer
DCP	Dynamic Cone Penetrometer
PSP	Perth Sand Penetrometer
MC	Moisture Content
PBT	Plate Bearing Test
IMP	Borehole Impression Test
PID	Photoionisation Detector
VS	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	Bulk disturbed sample
D	Disturbed sample
ES	Environmental sample
U	Thin wall tube 'undisturbed'

MOISTURE

D	Dry
M	Moist
W	Wet
PL	Plastic limit
LL	Liquid limit
w	Moisture content

SOIL CONSISTENCY

VS	Very Soft
S	Soft
F	Firm
St	Stiff
VSt	Very Stiff
H	Hard

RELATIVE DENSITY

VL	Very Loose
L	Loose
MD	Medium Dense
D	Dense
VD	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

Cardno

BOREHOLE LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: BH01

Job No: 5017190157
Sheet: 2 of 2

Position: E330215.509 N6241986.553 56 MGA94
Angle from Horizontal: 90°
Surface Elevation: 3.480 m AHD
Rig Type: Ute Mounted Drill Rig
Mounting: Light Vehicle
Driller: TR
Casing Diameter:
Contractor: Stratacore
Data Started: 10/11/18
Date Completed: 10/11/18
Logged By: DD
Checked By: JB

Drilling				Sampling & Testing			Material Description					
Method	Resistance	Casing	Water	Sample or Field Test	RL (m AHD)	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
WB	F-H			10.00 - 10.45 m BH01 10.00-10.45 ASS SPT 10.00 - 10.45 m 1, 0, 1 N=1	-7	11		CL-CI	Clayey CLAY: fine to medium, black, low plasticity clay	W	VL	MARINE
				SPT 11.50 - 11.95 m 4, 5, 7 N=12	-8 -9	11.50m 12		SP	SAND: medium grained, yellow grey		MD	
				SPT 13.00 - 13.45 m 4, 7, 14 N=21	-10	13.00m 14		SP	Clayey SAND: fine grained, grey, low plasticity clay		D to VD	
				SPT 14.50 - 14.80 m 26, 30 N=R SPT 16.00 - 16.45 m 0, 8, 30 N=38	-11 -12	14.60m 15 16		SP	SAND: fine to medium grained, grey yellow			WEATHERED ROCK
					-13 -14 -15 -16	16.45m 17 18 19			TERMINATED AT 16.45 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

- ▽ Water Level on Date shown
- ► water inflow
- ◄ water outflow

FIELD TESTS

SPT	Standard Penetration Test
HP	Hand/Pocket Penetrometer
DCP	Dynamic Cone Penetrometer
PSP	Perth Sand Penetrometer
MC	Moisture Content
PBT	Plate Bearing Test
IMP	Borehole Impression Test
PID	Photoionisation Detector
VS	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	Bulk disturbed sample
D	Disturbed sample
ES	Environmental sample
U	Thin wall tube 'undisturbed'

MOISTURE

D	Dry
M	Moist
W	Wet
PL	Plastic limit
LL	Liquid limit
w	Moisture content

SOIL CONSISTENCY

VS	Very Soft
S	Soft
F	Firm
St	Stiff
VSt	Very Stiff
H	Hard

RELATIVE DENSITY

VL	Very Loose
L	Loose
MD	Medium Dense
D	Dense
VD	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO 2.01.4 LIB.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 18/12/2018 14:35 8.30.004 Datgel AGS RTA, Photo, Monitoring Tools

Cardno

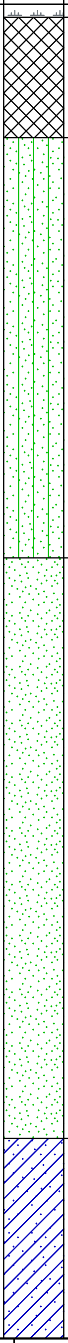
BOREHOLE LOG SHEET

Hole No: BH02

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157
Sheet: 1 of 2

Position: E330177.733 N6242026.438 56 MGA94
Angle from Horizontal: 90°
Surface Elevation: 4.600 m AHD
Rig Type: Ute Mounted Drill Rig
Mounting: Light Vehicle
Driller: TR
Casing Diameter:
Contractor: Stratacore
Data Started: 17/11/18
Date Completed: 17/11/18
Logged By: DD
Checked By: JB

Method	Resistance	Casing	Water	Sample or Field Test	RL (m AHD)	Depth (m)	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
AD/T	E					0.10m		Silty SAND: fine to medium grained, black brown, with organics	M		TOPSOIL
					4			FILL: Gravelly SAND: fine grained, grey brown, fine to medium grained gravel turning orange brown in colour			FILL
				SPT 1.00 - 1.45 m 3, 4, 5 N=9		1.00m	SP	Silty SAND: fine grained, pale brown	D to M	L to MD	MARINE
				D 1.50 - 2.00 m	3	2					
				SPT 2.50 - 2.95 m 2, 3, 2 N=5	2	3					
WB			07/11/18	SPT 4.00 - 4.45 m 2, 4, 8 N=12	1	4					
					0	4.15m	SP	SAND: fine to medium grained, yellow white	W	D	
				SPT 5.50 - 5.95 m 10, 18, 30 N=48	-1	5		trace of shell fragments			
					-2	6					
				SPT 7.00 - 7.45 m 21, 4, 4 N=8	-3	7		potential ass odour			
				SPT 8.50 - 8.95 m 0, 0, 0 N=0	-4	8.50m	CL	Sandy CLAY: low plasticity, black brown, fine grained sand		VS to S	
					-5	9					



METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽ Water Level on Date shown
▶ water inflow
◀ water outflow

FIELD TESTS

SPT	Standard Penetration Test
HP	Hand/Pocket Penetrometer
DCP	Dynamic Cone Penetrometer
PSP	Perth Sand Penetrometer
MC	Moisture Content
PBT	Plate Bearing Test
IMP	Borehole Impression Test
PID	Photoionisation Detector
VS	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	Bulk disturbed sample
D	Disturbed sample
ES	Environmental sample
U	Thin wall tube 'undisturbed'

MOISTURE

D	Dry
M	Moist
W	Wet
PL	Plastic limit
LL	Liquid limit
w	Moisture content

SOIL CONSISTENCY

VS	Very Soft
S	Soft
F	Firm
St	Stiff
VSt	Very Stiff
H	Hard

RELATIVE DENSITY

VL	Very Loose
L	Loose
MD	Medium Dense
D	Dense
VD	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

Cardno

BOREHOLE LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157

Hole No: BH02

Sheet: 2 of 2

Position: E330177.733 N6242026.438 56 MGA94
Angle from Horizontal: 90°
Surface Elevation: 4.600 m AHD
Rig Type: Ute Mounted Drill Rig
Mounting: Light Vehicle
Driller: TR
Casing Diameter:
Contractor: Stratacore
Data Started: 17/11/18
Date Completed: 17/11/18
Logged By: DD
Checked By: JB

Drilling				Sampling & Testing			Material Description					
Method	Resistance	Casing	Water	Sample or Field Test	RL (m AHD)	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
WB	E			SPT 10.00 - 10.45 m 0, 0, 0 N=0 SPT 11.50 - 11.95 m 20, 2, 4 N=6				CL	Sandy CLAY: low plasticity, black brown, fine grained sand *(continued)*	W	VS to S	MARINE
				SPT 13.00 - 13.45 m 2, 5, 8 N=13		13.00m		CL-CI	Sandy CLAY: low to medium plasticity, grey, fine grained sand		St	
				SPT 14.50 - 14.68 m 24, 30/30mm N=R		14.50m		SP	SAND: medium grained, grey		D to VD	
				SPT 16.00 - 16.45 m 7, 5, 5 N=10		16.00m		CI-CH	Sandy CLAY: medium to high plasticity, fine grained sand		H	
				SPT 17.50 - 17.95 m 16, 19, 17 N=36		17.50m		SP	Clayey SAND: fine to medium grained, grey, low plasticity clay		D to VD	
						17.95m			TERMINATED AT 17.95 m Target depth			

RL (m AHD): -6, -7, -8, -9, -10, -11, -12, -13, -14, -15
Depth (m): 11, 12, 13, 14, 15, 16, 17, 18, 19

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽ Water Level on Date shown
▶ water inflow
◀ water outflow

FIELD TESTS

SPT	Standard Penetration Test
HP	Hand/Pocket Penetrometer
DCP	Dynamic Cone Penetrometer
PSP	Perth Sand Penetrometer
MC	Moisture Content
PBT	Plate Bearing Test
IMP	Borehole Impression Test
PID	Photoionisation Detector
VS	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	Bulk disturbed sample
D	Disturbed sample
ES	Environmental sample
U	Thin wall tube 'undisturbed'

MOISTURE

D	Dry
M	Moist
W	Wet
PL	Plastic limit
LL	Liquid limit
w	Moisture content

SOIL CONSISTENCY

VS	Very Soft
S	Soft
F	Firm
St	Stiff
VSt	Very Stiff
H	Hard

RELATIVE DENSITY

VL	Very Loose
L	Loose
MD	Medium Dense
D	Dense
VD	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO 2.01.4 LIB.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 22/01/2019 15:46 8.30.004 Datgel AGS RTA, Photo, Monitoring Tools

Cardno

BOREHOLE LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157

Hole No: BH03

Sheet: 1 of 2

Position: E330229.353 N6241972.538 56 MGA94
Angle from Horizontal: 90°
Surface Elevation: 3.830 m AHD
Rig Type: Ute Mounted Drill Rig
Mounting: Light Vehicle
Driller: TR
Casing Diameter:
Contractor: Stratacore
Data Started: 17/11/18
Date Completed: 17/11/18
Logged By: DD
Checked By: JB

Depth (m)	Method	Resistance	Casing	Water	Sample or Field Test	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
0.00 – 0.10	AD/T	E-F						SAND: fine to medium grained, dark brown, with organics	D to M		TOPSOIL
0.10					D 0.20 - 0.50 m SPT 1.00 - 1.45 m 1, 3, 3 N=6	⁘	SP	SAND: fine to medium grained, pale brown			MARINE
1.50m					B 2.00 - 2.50 m SPT 2.50 - 2.95 m 2, 7, 10 N=17	⁘		SAND: fine to medium grained, yellow brown		MD	
	WB										
4.00m				▽ 07/11/18	SPT 4.00 - 4.45 m 6, 20, 22 N=42 SPT 5.50 - 5.95 m 3, 12, 27 N=39 SPT 7.00 - 7.45 m 7, 7, 6 N=13	⁘	SP	SAND: fine to medium grained, white yellow medium grained sand turning grey in colour	W	MD to D	
8.20m					SPT 8.50 - 8.95 m 0, 0, 1 N=1	▨	CL	Sandy CLAY: low plasticity, grey, fine to medium grained sand		VS	

RL (m AHD) scale: 3, 2, 1, 0, -1, -2, -3, -4, -5, -6
Depth (m) scale: 1, 2, 3, 4, 5, 6, 7, 8, 9

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
RR Rock roller

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
▽ Water Level on Date shown
▶ water inflow
◀ water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

BOREHOLE LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: BH03

Job No: 5017190157
Sheet: 2 of 2

Position: E330229.353 N6241972.538 56 MGA94
Angle from Horizontal: 90°
Surface Elevation: 3.830 m AHD
Rig Type: Ute Mounted Drill Rig
Mounting: Light Vehicle
Driller: TR
Casing Diameter:
Contractor: Stratacore
Data Started: 17/11/18
Date Completed: 17/11/18
Logged By: DD
Checked By: JB

Drilling				Sampling & Testing			Material Description					
Method	Resistance	Casing	Water	Sample or Field Test	RL (m AHD)	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
WB	E-F			SPT 10.00 - 10.45 m 0, 1, 0 N=1	-7	11	▨	CL	Sandy CLAY: low plasticity, grey, fine to medium grained sand *(continued)*	W	VS	MARINE
				SPT 11.50 - 11.95 m 12, 20, 18 N=38 SPT 13.00 - 13.45 m 12, 5, 8 N=13	-8 -9	12 13	░	SP	11.20m SAND: fine to medium grained, brown		MD to D	
					-10 -11 -12 -13 -14 -15 -16	14 15 16 17 18 19			13.45m TERMINATED AT 13.45 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽	Water Level on Date shown
►	water inflow
◄	water outflow

FIELD TESTS

SPT -	Standard Penetration Test
HP -	Hand/Pocket Penetrometer
DCP -	Dynamic Cone Penetrometer
PSP -	Perth Sand Penetrometer
MC -	Moisture Content
PBT -	Plate Bearing Test
IMP -	Borehole Impression Test
PID -	Photoionisation Detector
VS -	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B -	Bulk disturbed sample
D -	Disturbed sample
ES -	Environmental sample
U -	Thin wall tube 'undisturbed'

MOISTURE

D -	Dry
M -	Moist
W -	Wet
PL -	Plastic limit
LL -	Liquid limit
w -	Moisture content

SOIL CONSISTENCY

VS -	Very Soft
S -	Soft
F -	Firm
St -	Stiff
VSt -	Very Stiff
H -	Hard

RELATIVE DENSITY

VL -	Very Loose
L -	Loose
MD -	Medium Dense
D -	Dense
VD -	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO 2.01.4 LIB.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 18/12/2018 14:36 8.30.004 Datgel AGS RTA, Photo, Monitoring Tools

Cardno

BOREHOLE LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: BH04

Job No: 5017190157
Sheet: 1 of 1

Position: E330149.299 N6241929.836 56 MGA94	**Angle from Horizontal:** 90°	**Surface Elevation:** 4.380 m AHD
Rig Type: Ute Mounted Drill Rig	**Mounting:** Light Vehicle	**Driller:** TR
Casing Diameter:		**Contractor:** Stratacore
Data Started: 10/11/18 **Date Completed:** 10/11/18	**Logged By:** DD	**Checked By:** JB

Drilling				Sampling & Testing			Material Description					
Method	Resistance	Casing	Water	Sample or Field Test	RL (m AHD)	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
	E		Not Encountered			0.13m			ASPHALT: corase grained gravel, black	D		PAVEMENT
					4	0.50m			FILL: SAND: fine to medium grained, grey			FILL
				SPT 0.50 - 0.95 m 0, 0, 0 N=0 B 1.00 - 1.20 m	3	1 1.50m		SP	SAND: fine to medium grained, pale brown		L	MARINE
				B 1.50 - 2.00 m SPT 1.50 - 1.95 m 3, 5, 6 N=11 SPT 3.00 - 3.45 m 5, 12, 15 N=27	2 1	2 3 4.00m		SP	Silty SAND: fine to medium grained, brown Turning white/ pale brown in colour	D D to M	MD	
					0 -1 -2 -3 -4 -5	4 5 6 7 8 9			TERMINATED AT 4.00 m Refusal Borehole Refusal Depth Collapse at 4.0m 10/11/18 at 16:20			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

- ▽ Water Level on Date shown
- ▶ water inflow
- ◀ water outflow

FIELD TESTS

SPT	-	Standard Penetration Test
HP	-	Hand/Pocket Penetrometer
DCP	-	Dynamic Cone Penetrometer
PSP	-	Perth Sand Penetrometer
MC	-	Moisture Content
PBT	-	Plate Bearing Test
IMP	-	Borehole Impression Test
PID	-	Photoionisation Detector
VS	-	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	-	Bulk disturbed sample
D	-	Disturbed sample
ES	-	Environmental sample
U	-	Thin wall tube 'undisturbed'

MOISTURE

D	-	Dry
M	-	Moist
W	-	Wet
PL	-	Plastic limit
LL	-	Liquid limit
w	-	Moisture content

SOIL CONSISTENCY

VS	-	Very Soft
S	-	Soft
F	-	Firm
St	-	Stiff
VSt	-	Very Stiff
H	-	Hard

RELATIVE DENSITY

VL	-	Very Loose
L	-	Loose
MD	-	Medium Dense
D	-	Dense
VD	-	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO 2.01.4 LIB.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 18/12/2018 14:36 8.30.004 Datgel AGS RTA, Photo, Monitoring Tools

BOREHOLE LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: BH05

Job No: 5017190157
Sheet: 1 of 1

Position: E330122.818 N6241979.746 56 MGA94
Angle from Horizontal: 90°
Surface Elevation: 4.560 m AHD
Rig Type: Ute Mounted Drill Rig
Mounting: Light Vehicle
Driller: TR
Casing Diameter:
Contractor: Stratacore
Data Started: 10/11/18
Date Completed: 10/11/18
Logged By: DD
Checked By: JB

Drilling				Sampling & Testing			Material Description					
Method	Resistance	Casing	Water	Sample or Field Test	RL (m AHD)	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
AD/T			Not Encountered						0.20m Gravelly SAND: fine grained, black			TOPSOIL
				D 0.20 - 0.50 m SPT 0.50 - 0.95 m 3, 6, 6 N=12 D 1.00 - 1.10 m SPT 1.50 - 1.95 m 2, 3, 4 N=7	4 3	1		SP	Silty SAND: fine grained, dark grey 2.00m	D	L to MD	MARINE
				SPT 3.00 - 3.45 m 3, 5, 9 N=14	2 1	2 3 4		SP	Silty SAND: fine grained, brown 4.50m	D to M	MD	
				SPT 4.50 - 4.95 m 2, 3, 9 N=12	0	5		SP	SAND: fine to medium grained, pale brown 5.50m	M	MD	
					-1 -2 -3 -4 -5	6 7 8 9			TERMINATED AT 5.50 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽	Water Level on Date shown
▶	water inflow
◀	water outflow

FIELD TESTS

SPT	Standard Penetration Test
HP	Hand/Pocket Penetrometer
DCP	Dynamic Cone Penetrometer
PSP	Perth Sand Penetrometer
MC	Moisture Content
PBT	Plate Bearing Test
IMP	Borehole Impression Test
PID	Photoionisation Detector
VS	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	Bulk disturbed sample
D	Disturbed sample
ES	Environmental sample
U	Thin wall tube 'undisturbed'

MOISTURE

D	Dry
M	Moist
W	Wet
PL	Plastic limit
LL	Liquid limit
w	Moisture content

SOIL CONSISTENCY

VS	Very Soft
S	Soft
F	Firm
St	Stiff
VSt	Very Stiff
H	Hard

RELATIVE DENSITY

VL	Very Loose
L	Loose
MD	Medium Dense
D	Dense
VD	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO 2.01.4 LIB.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 18/12/2018 14:36 8.30.004 Datgel AGS RTA, Photo, Monitoring Tools

TEST PIT LOG SHEET

Hole No: TP01

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157
Sheet: 1 of 1

Position: E330227.528 N6242031.053 56 MGA94
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX					0.20m			Silty SAND: fine to medium grained, poorly graded, black, with coal ash layer	D		TOPSOIL 0.00 m: PID = 0.1ppm
				ES 0.20 m TP01_0.2 ES 0.90 m TP01_0.9	0.5 0.90m	▨		FILL: SAND: fine to medium grained, uniform, brown yellow grey	M		FILL 0.20 m: PID = 0.0 ppm
					1.0 1.40m	⁘		SAND: fine to medium grained, uniform, yellow brown	M	F	MARINE
					1.5 2.0 2.5 3.0 3.5 4.0 4.5			TERMINATED AT 1.40 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽	Water Level on Date shown
►	water inflow
◄	water outflow

FIELD TESTS

SPT	Standard Penetration Test
HP	Hand/Pocket Penetrometer
DCP	Dynamic Cone Penetrometer
PSP	Perth Sand Penetrometer
MC	Moisture Content
PBT	Plate Bearing Test
IMP	Borehole Impression Test
PID	Photoionisation Detector
VS	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	Bulk disturbed sample
D	Disturbed sample
ES	Environmental sample
U	Thin wall tube 'undisturbed'

MOISTURE

D	Dry
M	Moist
W	Wet
PL	Plastic limit
LL	Liquid limit
w	Moisture content

SOIL CONSISTENCY

VS	Very Soft
S	Soft
F	Firm
St	Stiff
VSt	Very Stiff
H	Hard

RELATIVE DENSITY

VL	Very Loose
L	Loose
MD	Medium Dense
D	Dense
VD	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

Cardno

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157

Hole No: TP02

Sheet: 1 of 1

Position: E330192.866 N6242040.364 56 MGA94
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP02_0.1				Silty SAND: fine to medium grained, poorly graded, brown grey 0.10m			TOPSOIL 0.00 m: PID = 3.5 ppm
				ES 0.40 m TP02_0.4		▨		FILL: Silty SAND: fine to medium grained, uniform, yellow brown 0.40m	D		FILL 0.10 m: PID = 8.3 ppm
					0.5			SAND: fine to medium grained, uniform, yellow brown 0.90m	M	F	MARINE
					1.0			TERMINATED AT 0.90 m Target depth			
					1.5						
					2.0						
					2.5						
					3.0						
					3.5						
					4.0						
					4.5						

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

- Water Level on Date shown
- water inflow
- water outflow

FIELD TESTS

SPT	- Standard Penetration Test
HP	- Hand/Pocket Penetrometer
DCP	- Dynamic Cone Penetrometer
PSP	- Perth Sand Penetrometer
MC	- Moisture Content
PBT	- Plate Bearing Test
IMP	- Borehole Impression Test
PID	- Photoionisation Detector
VS	- Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	- Bulk disturbed sample
D	- Disturbed sample
ES	- Environmental sample
U	- Thin wall tube 'undisturbed'

MOISTURE

D	- Dry
M	- Moist
W	- Wet
PL	- Plastic limit
LL	- Liquid limit
w	- Moisture content

SOIL CONSISTENCY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard

RELATIVE DENSITY

VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 03/12/2018 16:17 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

Cardno

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: TP03

Job No: 5017190157
Sheet: 1 of 1

Position: 56 MGA94	**Angle from Horizontal:** 90°	**Surface Elevation:**
Machine Type: 10 tonne Excavator	**Excavation Method:**	
Excavation Dimensions:		**Contractor:**
Date Excavated: 10/11/18	**Logged By:** JG	**Checked By:**

Excavation: Method	Excavation: Resistance	Excavation: Stability	Water	Sampling & Testing: Sample or Field Test	Depth (m)	Material Description: Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.20 m TP03_0.2	0.20m			Silty SAND: fine to medium grained, poorly graded, grey brown mottled white	D		TOPSOIL 0.00 m: PID = 0.2ppm
				ES 1.20 m TP03_1.2	0.5 1.0 1.20m			FILL: Silty SAND: fine to medium grained, poorly graded, white grey brown mottled black	D		FILL 0.20 m: PID = 1.2ppm
					1.5 1.70m			SAND: fine to medium grained, uniform, yellow brown	M	F	MARINE
					2.0 2.5 3.0 3.5 4.0 4.5			TERMINATED AT 1.70 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

- ▽ Water Level on Date shown
- ▶ water inflow
- ◀ water outflow

FIELD TESTS

- SPT - Standard Penetration Test
- HP - Hand/Pocket Penetrometer
- DCP - Dynamic Cone Penetrometer
- PSP - Perth Sand Penetrometer
- MC - Moisture Content
- PBT - Plate Bearing Test
- IMP - Borehole Impression Test
- PID - Photoionisation Detector
- VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

- B - Bulk disturbed sample
- D - Disturbed sample
- ES - Environmental sample
- U - Thin wall tube 'undisturbed'

MOISTURE

- D - Dry
- M - Moist
- W - Wet
- PL - Plastic limit
- LL - Liquid limit
- *w* - Moisture content

SOIL CONSISTENCY

- VS - Very Soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard

RELATIVE DENSITY

- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
- VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 03/12/2018 16:17 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

Cardno

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: TP04

Job No: 5017190157
Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation: Method	Excavation: Resistance	Excavation: Stability	Water	Sampling & Testing: Sample or Field Test	Depth (m)	Graphic Log	Classification	Material Description: SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP04_0.1	0.10m	⺌		Silty SAND: fine to medium grained, poorly graded, brown black	D		TOPSOIL 0.00 m: PID = 2.6ppm
				ES 0.40 m TP04_0.4	0.40m	▩		FILL: Silty SAND: fine to medium grained, poorly graded, brown grey	D		FILL 0.10 m: PID = 1.7ppm
					0.5 0.90m	░		SAND: fine to medium grained, uniform, yellow brown	M	F	MARINE
					1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5			TERMINATED AT 0.90 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽	Water Level on Date shown
▶	water inflow
◀	water outflow

FIELD TESTS

SPT -	Standard Penetration Test
HP -	Hand/Pocket Penetrometer
DCP -	Dynamic Cone Penetrometer
PSP -	Perth Sand Penetrometer
MC -	Moisture Content
PBT -	Plate Bearing Test
IMP -	Borehole Impression Test
PID -	Photoionisation Detector
VS -	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B -	Bulk disturbed sample
D -	Disturbed sample
ES -	Environmental sample
U -	Thin wall tube 'undisturbed'

MOISTURE

D -	Dry
M -	Moist
W -	Wet
PL -	Plastic limit
LL -	Liquid limit
w -	Moisture content

SOIL CONSISTENCY

VS -	Very Soft
S -	Soft
F -	Firm
St -	Stiff
VSt -	Very Stiff
H -	Hard

RELATIVE DENSITY

VL -	Very Loose
L -	Loose
MD -	Medium Dense
D -	Dense
VD -	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 03/12/2018 16:17 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: TP05

Job No: 5017190157
Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP05_0.1	0.10m	▨		FILL: Silty SAND: fine to medium grained, uniform, grey brown	D		FILL 0.00 m: PID = 3.7ppm
								SAND: fine to medium grained, uniform, white yellow grey			MARINE 0.10 m: PID = 0.8ppm
					0.5				M	F	
				ES 0.90 m TP05_0.9	0.90m						
								TERMINATED AT 0.90 m Target depth			
					1.0						
					1.5						
					2.0						
					2.5						
					3.0						
					3.5						
					4.0						
					4.5						

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

- ▽ Water Level on Date shown
- ▶ water inflow
- ◀ water outflow

FIELD TESTS

SPT -	Standard Penetration Test
HP -	Hand/Pocket Penetrometer
DCP -	Dynamic Cone Penetrometer
PSP -	Perth Sand Penetrometer
MC -	Moisture Content
PBT -	Plate Bearing Test
IMP -	Borehole Impression Test
PID -	Photoionisation Detector
VS -	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B -	Bulk disturbed sample
D -	Disturbed sample
ES -	Environmental sample
U -	Thin wall tube 'undisturbed'

MOISTURE

D -	Dry
M -	Moist
W -	Wet
PL -	Plastic limit
LL -	Liquid limit
w -	Moisture content

SOIL CONSISTENCY

VS -	Very Soft
S -	Soft
F -	Firm
St -	Stiff
VSt -	Very Stiff
H -	Hard

RELATIVE DENSITY

VL -	Very Loose
L -	Loose
MD -	Medium Dense
D -	Dense
VD -	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: TP06

Job No: 5017190157
Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:

Machine Type: 10 tonne Excavator
Excavation Method:

Excavation Dimensions:
Contractor:

Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP06_0.1				0.10m Gravelly SAND: fine grained, poorly graded, brown black, medium to coarse grained gravel	D		TOPSOIL 0.00 m: PID = 1.8ppm
				ES 0.30 m TP06_0.3				0.30m FILL: GRAVEL: medium, poorly graded, black mottled yellow	D		FILL 0.10 m: PID = 3.4ppm
					0.5			0.80m SAND: fine to medium grained, uniform, yellow brown	M	F	MARINE
					1.0			TERMINATED AT 0.80 m Target depth			
					1.5						
					2.0						
					2.5						
					3.0						
					3.5						
					4.0						
					4.5						

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

Water Level on Date shown
▶ water inflow
◀ water outflow

FIELD TESTS

SPT	- Standard Penetration Test
HP	- Hand/Pocket Penetrometer
DCP	- Dynamic Cone Penetrometer
PSP	- Perth Sand Penetrometer
MC	- Moisture Content
PBT	- Plate Bearing Test
IMP	- Borehole Impression Test
PID	- Photoionisation Detector
VS	- Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	- Bulk disturbed sample
D	- Disturbed sample
ES	- Environmental sample
U	- Thin wall tube 'undisturbed'

MOISTURE

D	- Dry
M	- Moist
W	- Wet
PL	- Plastic limit
LL	- Liquid limit
w	- Moisture content

SOIL CONSISTENCY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard

RELATIVE DENSITY

VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Job No: 5017190157

Hole No: TP07

Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP07_0.1	0.10m			Silty SAND: fine to medium grained, poorly graded, brown	D		TOPSOIL 0.00 m: PID = 4.2 ppm
				ES 0.40 m TP07_0.4	0.40m			FILL: Silty SAND: fine to medium grained, uniform, brown			FILL 0.10 m: PID = 2.3 ppm
				ES 0.60 m TP07_0.6	0.5 0.60m			FILL: Gravelly SAND: fine to medium grained, gap graded, brown yellow, medium to coarse grained gravel			0.40 m: PID = 1.3 ppm
					1.0 1.10m			SAND: fine to medium grained, uniform, yellow brown	M	F	MARINE
					1.5 2.0 2.5 3.0 3.5 4.0 4.5			TERMINATED AT 1.10 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽ Water Level on Date shown
▶ water inflow
◀ water outflow

FIELD TESTS

SPT -	Standard Penetration Test
HP -	Hand/Pocket Penetrometer
DCP -	Dynamic Cone Penetrometer
PSP -	Perth Sand Penetrometer
MC -	Moisture Content
PBT -	Plate Bearing Test
IMP -	Borehole Impression Test
PID -	Photoionisation Detector
VS -	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B -	Bulk disturbed sample
D -	Disturbed sample
ES -	Environmental sample
U -	Thin wall tube 'undisturbed'

MOISTURE

D -	Dry
M -	Moist
W -	Wet
PL -	Plastic limit
LL -	Liquid limit
w -	Moisture content

SOIL CONSISTENCY

VS -	Very Soft
S -	Soft
F -	Firm
St -	Stiff
VSt -	Very Stiff
H -	Hard

RELATIVE DENSITY

VL -	Very Loose
L -	Loose
MD -	Medium Dense
D -	Dense
VD -	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: TP08
Job No: 5017190157
Sheet: 1 of 1

Position: See attached plan	**Angle from Horizontal:** 90°	**Surface Elevation:**
Machine Type: 10 tonne Excavator	**Excavation Method:**	
Excavation Dimensions:		**Contractor:**
Date Excavated: 10/11/18	**Logged By:** JG	**Checked By:**

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP08_0.1	0.10m	⺌		Silty SAND: fine to medium grained, gap graded, brown	D		TOPSOIL 0.00 m: PID = 2.9ppm
				ES 0.40 m TP08_0.4	0.40m	▩		FILL: SAND: fine to medium grained, uniform, brown	D		FILL 0.10 m: PID = 4.0ppm
					0.5 0.90m	⠿		SAND: fine to medium grained, uniform, yellow brown	M	F	MARINE
					1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5			TERMINATED AT 0.90 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽ Water Level on Date shown
▶ water inflow
◀ water outflow

FIELD TESTS

SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE

D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY

VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY

VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 03/12/2018 16:17 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157

Hole No: TP09

Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.30 m TP09_0.3				Silty SAND: fine to medium grained, uniform, brown yellow	D		TOPSOIL 0.00 m: PID = 3.3ppm
				ES 0.80 m TP09_0.8	0.5		0.30m	SAND: fine to medium grained, uniform, yellow brown	M	F	MARINE 0.30 m: PID = 2.0ppm
					1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5		0.80m	TERMINATED AT 0.80 m Target depth			

METHOD
- EX Excavator bucket
- R Ripper
- HA Hand auger
- PT Push tube
- SON Sonic drilling
- AH Air hammer
- PS Percussion sampler
- AS Short spiral auger
- AD/V Solid flight auger: V-Bit
- AD/T Solid flight auger: TC-Bit
- HFA Hollow flight auger
- WB Washbore drilling
- RR Rock roller

PENETRATION
- VE Very Easy (No Resistance)
- E Easy
- F Firm
- H Hard
- VH Very Hard (Refusal)

WATER
- Water Level on Date shown
- ▶ water inflow
- ◀ water outflow

FIELD TESTS
- SPT - Standard Penetration Test
- HP - Hand/Pocket Penetrometer
- DCP - Dynamic Cone Penetrometer
- PSP - Perth Sand Penetrometer
- MC - Moisture Content
- PBT - Plate Bearing Test
- IMP - Borehole Impression Test
- PID - Photoionisation Detector
- VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
- B - Bulk disturbed sample
- D - Disturbed sample
- ES - Environmental sample
- U - Thin wall tube 'undisturbed'

MOISTURE
- D - Dry
- M - Moist
- W - Wet
- PL - Plastic limit
- LL - Liquid limit
- *w* - Moisture content

SOIL CONSISTENCY
- VS - Very Soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard

RELATIVE DENSITY
- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
- VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157

Hole No: TP10

Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP10_0.1			0.10m	Silty SAND: fine to medium grained, uniform, brown			TOPSOIL 0.00 m: PID = 2.3ppm
				ES 0.40 m TP10_0.4			0.40m	FILL: SAND: fine to medium grained, uniform, brown yellow	D		FILL 0.10 m: PID = 3.4ppm
					0.5		0.90m	SAND: fine to medium grained, uniform, yellow brown	M	F	MARINE
					1.0			TERMINATED AT 0.90 m Target depth			
					1.5						
					2.0						
					2.5						
					3.0						
					3.5						
					4.0						
					4.5						

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽	Water Level on Date shown
▶	water inflow
◀	water outflow

FIELD TESTS

SPT -	Standard Penetration Test
HP -	Hand/Pocket Penetrometer
DCP -	Dynamic Cone Penetrometer
PSP -	Perth Sand Penetrometer
MC -	Moisture Content
PBT -	Plate Bearing Test
IMP -	Borehole Impression Test
PID -	Photoionisation Detector
VS -	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B -	Bulk disturbed sample
D -	Disturbed sample
ES -	Environmental sample
U -	Thin wall tube 'undisturbed'

MOISTURE

D -	Dry
M -	Moist
W -	Wet
PL -	Plastic limit
LL -	Liquid limit
w -	Moisture content

SOIL CONSISTENCY

VS -	Very Soft
S -	Soft
F -	Firm
St -	Stiff
VSt -	Very Stiff
H -	Hard

RELATIVE DENSITY

VL -	Very Loose
L -	Loose
MD -	Medium Dense
D -	Dense
VD -	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

Cardno

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157

Hole No: TP11

Sheet: 1 of 1

Position: See attached plan	**Angle from Horizontal:** 90°	**Surface Elevation:**
Machine Type: 10 tonne Excavator	**Excavation Method:**	
Excavation Dimensions:		**Contractor:**
Date Excavated: 10/11/18	**Logged By:** JG	**Checked By:**

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.20 m TP11_0.2	0.20m			Silty SAND: fine to medium grained, uniform, brown white	D		TOPSOIL 0.00 m: PID = 2.0ppm
				ES 1.20 m TP11_1.2	1.20m			SAND: fine to medium grained, uniform, yellow brown	M	F	MARINE 0.20 m: PID = 2.5ppm
								TERMINATED AT 1.20 m Target depth			

Depth scale (m): 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽	Water Level on Date shown
►	water inflow
◄	water outflow

FIELD TESTS

SPT	- Standard Penetration Test
HP	- Hand/Pocket Penetrometer
DCP	- Dynamic Cone Penetrometer
PSP	- Perth Sand Penetrometer
MC	- Moisture Content
PBT	- Plate Bearing Test
IMP	- Borehole Impression Test
PID	- Photoionisation Detector
VS	- Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	- Bulk disturbed sample
D	- Disturbed sample
ES	- Environmental sample
U	- Thin wall tube 'undisturbed'

MOISTURE

D	- Dry
M	- Moist
W	- Wet
PL	- Plastic limit
LL	- Liquid limit
w	- Moisture content

SOIL CONSISTENCY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard

RELATIVE DENSITY

VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: TP12

Job No: 5017190157
Sheet: 1 of 1

Position: See attached plan	**Angle from Horizontal:** 90°	**Surface Elevation:**
Machine Type: 10 tonne Excavator	**Excavation Method:**	
Excavation Dimensions:		**Contractor:**
Date Excavated: 10/11/18	**Logged By:** JG	**Checked By:**

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.20 m TP12_0.2, QA100, QA200	0.20m	▨		FILL: SAND: fine to medium grained, uniform, brown yellow	D		FILL 0.00 m: PID = 2.2ppm
				ES 1.00 m TP12_1.0	0.5 1.00m	░	SP	SAND: fine to medium grained, uniform, yellow brown		L	MARINE 0.20 m: PID = 2.5ppm
					1.0			TERMINATED AT 1.00 m Target depth			
					1.5 2.0 2.5 3.0 3.5 4.0 4.5						

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽ Water Level on Date shown
► water inflow
◄ water outflow

FIELD TESTS

SPT	- Standard Penetration Test
HP	- Hand/Pocket Penetrometer
DCP	- Dynamic Cone Penetrometer
PSP	- Perth Sand Penetrometer
MC	- Moisture Content
PBT	- Plate Bearing Test
IMP	- Borehole Impression Test
PID	- Photoionisation Detector
VS	- Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	- Bulk disturbed sample
D	- Disturbed sample
ES	- Environmental sample
U	- Thin wall tube 'undisturbed'

MOISTURE

D	- Dry
M	- Moist
W	- Wet
PL	- Plastic limit
LL	- Liquid limit
w	- Moisture content

SOIL CONSISTENCY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard

RELATIVE DENSITY

VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

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TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: TP13

Job No: 5017190157
Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP13_0.1				Silty SAND: fine to medium grained, poorly graded, brown grey, trace fine to medium grained gravel	D		TOPSOIL 0.00 m: PID = 0.6 ppm, bricks, concrete chuncks, plastic sheeting
				ES 0.40 m TP13_0.4	0.10m			FILL: SAND: fine to medium grained, gap graded, brown, trace fine to medium grained gravel			FILL 0.10 m: PID = 0.8 ppm, large concrete chunks present
					0.40m 0.5		SP	SAND: fine to medium grained, uniform, yellow brown	M	MD	MARINE
					0.90m 1.0			TERMINATED AT 0.90 m Target depth			
					1.5 2.0 2.5 3.0 3.5 4.0 4.5						

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

- ▽ Water Level on Date shown
- ▶ water inflow
- ◀ water outflow

FIELD TESTS

SPT	Standard Penetration Test
HP	Hand/Pocket Penetrometer
DCP	Dynamic Cone Penetrometer
PSP	Perth Sand Penetrometer
MC	Moisture Content
PBT	Plate Bearing Test
IMP	Borehole Impression Test
PID	Photoionisation Detector
VS	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	Bulk disturbed sample
D	Disturbed sample
ES	Environmental sample
U	Thin wall tube 'undisturbed'

MOISTURE

D	Dry
M	Moist
W	Wet
PL	Plastic limit
LL	Liquid limit
w	Moisture content

SOIL CONSISTENCY

VS	Very Soft
S	Soft
F	Firm
St	Stiff
VSt	Very Stiff
H	Hard

RELATIVE DENSITY

VL	Very Loose
L	Loose
MD	Medium Dense
D	Dense
VD	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157

Hole No: TP14

Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP14_0.1	0.10m	▨		FILL: Silty SAND: fine to medium grained, gap graded, grey	D		FILL 0.00 m: PID = 0.6 ppm
				ES 0.70 m TP14_0.7	0.5 0.70m	░	SP	SAND: fine to medium grained, uniform, grey yellow	M	L	MARINE 0.10 m: PID = 0.7 ppm
					1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5			TERMINATED AT 0.70 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

- Water Level on Date shown
- water inflow
- water outflow

FIELD TESTS

SPT	Standard Penetration Test
HP	Hand/Pocket Penetrometer
DCP	Dynamic Cone Penetrometer
PSP	Perth Sand Penetrometer
MC	Moisture Content
PBT	Plate Bearing Test
IMP	Borehole Impression Test
PID	Photoionisation Detector
VS	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	Bulk disturbed sample
D	Disturbed sample
ES	Environmental sample
U	Thin wall tube 'undisturbed'

MOISTURE

D	Dry
M	Moist
W	Wet
PL	Plastic limit
LL	Liquid limit
w	Moisture content

SOIL CONSISTENCY

VS	Very Soft
S	Soft
F	Firm
St	Stiff
VSt	Very Stiff
H	Hard

RELATIVE DENSITY

VL	Very Loose
L	Loose
MD	Medium Dense
D	Dense
VD	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

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TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: TP15

Job No: 5017190157
Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:

Machine Type: 10 tonne Excavator
Excavation Method:

Excavation Dimensions:
Contractor:

Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP15_0.1	0.10m	⩊		SAND: fine to medium grained, gap graded, grey	D		TOPSOIL 0.00 m: PID = 0.4ppm
				ES 0.60 m TP15_0.6	0.5 0.60m	▩		FILL: SAND: fine to medium grained, poorly graded, grey brown			FILL 0.10 m: PID = 0.2ppm , large concrete chunk present
					1.0 1.10m	░	SP	SAND: fine to medium grained, uniform, yellow brown	M	MD	MARINE
					1.5 2.0 2.5 3.0 3.5 4.0 4.5			TERMINATED AT 1.10 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

- ▽ Water Level on Date shown
- ▶ water inflow
- ◀ water outflow

FIELD TESTS

SPT	- Standard Penetration Test
HP	- Hand/Pocket Penetrometer
DCP	- Dynamic Cone Penetrometer
PSP	- Perth Sand Penetrometer
MC	- Moisture Content
PBT	- Plate Bearing Test
IMP	- Borehole Impression Test
PID	- Photoionisation Detector
VS	- Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	- Bulk disturbed sample
D	- Disturbed sample
ES	- Environmental sample
U	- Thin wall tube 'undisturbed'

MOISTURE

D	- Dry
M	- Moist
W	- Wet
PL	- Plastic limit
LL	- Liquid limit
w	- Moisture content

SOIL CONSISTENCY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard

RELATIVE DENSITY

VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

Cardno

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: TP16

Job No: 5017190157
Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP16_0.1 , QA 300, QA 400	0.10m			Silty SAND: fine to medium grained, poorly graded, grey	D		TOPSOIL 0.00 m: PID = 0.6ppm
				ES 0.80 m TP16_0.8	0.80m		SP	SAND: fine to medium grained, poorly graded, yellow grey	M	L	MARINE 0.10 m: PID = 0.3ppm
								TERMINATED AT 0.80 m Target depth			

Depth scale (m): 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽	Water Level on Date shown
►	water inflow
◄	water outflow

FIELD TESTS

SPT	- Standard Penetration Test
HP	- Hand/Pocket Penetrometer
DCP	- Dynamic Cone Penetrometer
PSP	- Perth Sand Penetrometer
MC	- Moisture Content
PBT	- Plate Bearing Test
IMP	- Borehole Impression Test
PID	- Photoionisation Detector
VS	- Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	- Bulk disturbed sample
D	- Disturbed sample
ES	- Environmental sample
U	- Thin wall tube 'undisturbed'

MOISTURE

D	- Dry
M	- Moist
W	- Wet
PL	- Plastic limit
LL	- Liquid limit
w	- Moisture content

SOIL CONSISTENCY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard

RELATIVE DENSITY

VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 03/12/2018 16:17 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

TEST PIT LOG SHEET

Hole No: TP17

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157
Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP17_0.1	0.10m			SAND: fine to medium grained, poorly graded, grey brown, silt	D		TOPSOIL 0.00 m: PID = 0.4ppm
				ES 0.50 m TP17_0.5	0.50m		SP	SAND: fine to medium grained, uniform, yellow grey	M	MD	MARINE 0.10 m: PID = 0.4ppm
					0.5			TERMINATED AT 0.50 m Target depth			
					1.0						
					1.5						
					2.0						
					2.5						
					3.0						
					3.5						
					4.0						
					4.5						

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽ Water Level on Date shown
► water inflow
◄ water outflow

FIELD TESTS

SPT	Standard Penetration Test
HP	Hand/Pocket Penetrometer
DCP	Dynamic Cone Penetrometer
PSP	Perth Sand Penetrometer
MC	Moisture Content
PBT	Plate Bearing Test
IMP	Borehole Impression Test
PID	Photoionisation Detector
VS	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	Bulk disturbed sample
D	Disturbed sample
ES	Environmental sample
U	Thin wall tube 'undisturbed'

MOISTURE

D	Dry
M	Moist
W	Wet
PL	Plastic limit
LL	Liquid limit
w	Moisture content

SOIL CONSISTENCY

VS	Very Soft
S	Soft
F	Firm
St	Stiff
VSt	Very Stiff
H	Hard

RELATIVE DENSITY

VL	Very Loose
L	Loose
MD	Medium Dense
D	Dense
VD	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

Cardno

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: TP18

Job No: 5017190157
Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP18_0.1				Silty SAND: fine to medium grained, poorly graded, grey brown 0.10m	D		TOPSOIL 0.00 m: PID = 0.1ppm
				ES 0.40 m TP18_0.4			SP	SAND: fine to medium grained, uniform, yellow grey 0.40m	M	L	MARINE 0.10 m: PID = 0.1ppm
					0.5			TERMINATED AT 0.40 m Target depth			
					1.0						
					1.5						
					2.0						
					2.5						
					3.0						
					3.5						
					4.0						
					4.5						

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽ Water Level on Date shown
▶ water inflow
◀ water outflow

FIELD TESTS

SPT	Standard Penetration Test
HP	Hand/Pocket Penetrometer
DCP	Dynamic Cone Penetrometer
PSP	Perth Sand Penetrometer
MC	Moisture Content
PBT	Plate Bearing Test
IMP	Borehole Impression Test
PID	Photoionisation Detector
VS	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	Bulk disturbed sample
D	Disturbed sample
ES	Environmental sample
U	Thin wall tube 'undisturbed'

MOISTURE

D	Dry
M	Moist
W	Wet
PL	Plastic limit
LL	Liquid limit
w	Moisture content

SOIL CONSISTENCY

VS	Very Soft
S	Soft
F	Firm
St	Stiff
VSt	Very Stiff
H	Hard

RELATIVE DENSITY

VL	Very Loose
L	Loose
MD	Medium Dense
D	Dense
VD	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

Cardno

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: TP19

Job No: 5017190157
Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP19_0.1				Silty SAND: fine to medium grained, poorly graded, brown grey	D		TOPSOIL 0.00 m: PID = 0.3ppm
				ES 0.30 m TP19_0.3				0.10m FILL: Gravelly SAND: fine to medium grained, gap graded, brown grey, fine to medium grained gravel			FILL 0.10 m: PID = 3.3ppm
					0.5		SP	0.30m SAND: fine to medium grained, uniform, yellow grey	M	L	MARINE
								0.80m TERMINATED AT 0.80 m Target depth			
					1.0						
					1.5						
					2.0						
					2.5						
					3.0						
					3.5						
					4.0						
					4.5						

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽ Water Level on Date shown
► water inflow
◄ water outflow

FIELD TESTS

SPT	- Standard Penetration Test
HP	- Hand/Pocket Penetrometer
DCP	- Dynamic Cone Penetrometer
PSP	- Perth Sand Penetrometer
MC	- Moisture Content
PBT	- Plate Bearing Test
IMP	- Borehole Impression Test
PID	- Photoionisation Detector
VS	- Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	- Bulk disturbed sample
D	- Disturbed sample
ES	- Environmental sample
U	- Thin wall tube 'undisturbed'

MOISTURE

D	- Dry
M	- Moist
W	- Wet
PL	- Plastic limit
LL	- Liquid limit
w	- Moisture content

SOIL CONSISTENCY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard

RELATIVE DENSITY

VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: TP20

Job No: 5017190157
Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP20_0.1	0.10m			Silty SAND: fine to medium grained, poorly graded, grey	D		TOPSOIL 0.00 m: PID = 0.5ppm
				ES 0.40 m TP20_0.4	0.40m			FILL: SAND: fine to medium grained, uniform, yellow brown			FILL 0.10 m: PID = 0.3ppm
					0.5 0.90m		SP	SAND: fine to medium grained, uniform, yellow grey	M	L	MARINE
					1.0			TERMINATED AT 0.90 m Target depth			
					1.5						
					2.0						
					2.5						
					3.0						
					3.5						
					4.0						
					4.5						

METHOD

EX	Excavator bucket
R	Ripper
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AS	Short spiral auger
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- Water Level on Date shown
- water inflow
- water outflow

FIELD TESTS

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- HP - Hand/Pocket Penetrometer
- DCP - Dynamic Cone Penetrometer
- PSP - Perth Sand Penetrometer
- MC - Moisture Content
- PBT - Plate Bearing Test
- IMP - Borehole Impression Test
- PID - Photoionisation Detector
- VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

- B - Bulk disturbed sample
- D - Disturbed sample
- ES - Environmental sample
- U - Thin wall tube 'undisturbed'

MOISTURE

- D - Dry
- M - Moist
- W - Wet
- PL - Plastic limit
- LL - Liquid limit
- *w* - Moisture content

SOIL CONSISTENCY

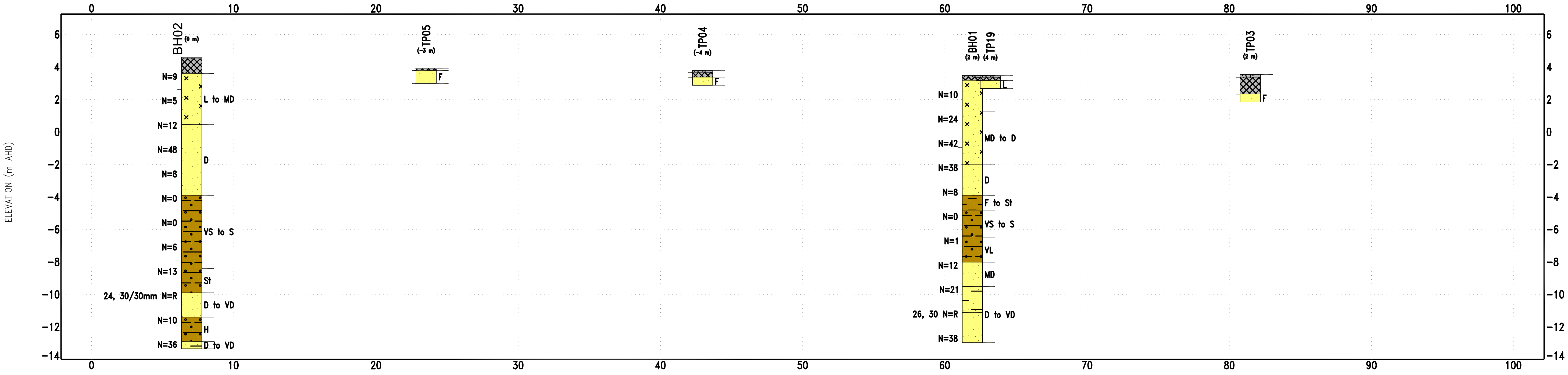
- VS - Very Soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard

RELATIVE DENSITY

- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
- VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD



H 1:500

0 2 4 6 8 10m

V 1:250

0 2 4 6 8 10m

Coord.System: MGA94 Zone 56 Height Datum: AHD

MATERIAL GRAPHIC

- TOPSOIL
- FILL
- Silty SAND
- SAND
- Silty CLAY
- Sandy CLAY
- Clayey SAND

INDICATIVE GEOLOGICAL CROSS SECTION KYEEMAGH INFANTS SCHOOL

APPENDIX 13: DETAILED SITE INVESTIGATION

Detailed Site Investigation

Kyeemagh Infants School, Corner of Jacobson Avenue and Beehag Street, Kyeemagh NSW

80818157

Prepared for
DWP Australia Pty Ltd

23 January 2019

Contact Information

Cardno (NSW/ACT) Pty Ltd
ABN 95 001 145 035

Level 9 - The Forum
203 Pacific Highway
St Leonards NSW 2065
Australia

www.cardno.com
Phone +61 2 9496 7700
Fax +61 2 9439 5170

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Author(s):

Ben Withnall
Environmental Scientist

Effective Date 23/01/2019

Approved By:

Robert Campbell
Senior Environmental Scientist

Date Approved 23/01/2019

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Rev0	23/01/2018	Final Report	BW	RC

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Executive Summary

Cardno (NSW/ACT) Pty Ltd ("Cardno") was engaged by DWP Australia Pty Ltd ("the Client") to undertake a Detailed Site Investigation (DSI) for the proposed redevelopment of Kyeemagh Infants School, located on the corner of Jacobson Avenue and Beehag Street, Kyeemagh NSW 2216 ("the Site"). The Site is legally identified as Part Lot 1 within Deposited Plan (DP) 335734 and Lot 1 within DP 120095. The pre-school facility in the eastern portion of the Site is excluded from the scope of investigation. The DSI has been prepared in accordance with the scope of works presented in Cardno's proposal dated 29 November 2018.

The Department of Education is proposing to redevelop the Site to increase its current capacity from a K-2 capable school to a K-6 capable school. The purpose of the DSI was to assess soil and groundwater conditions at the Site with regards to potential contamination and Acid Sulfate Soils (ASS) in accordance with Item 12 of the Secretaries Environmental Assessment Requirements for Application Number SSD 9391.

The objective of the DSI was to investigate the potential for soil and groundwater contamination at the site which may pose a risk to human health or the environment under the proposed redevelopment as a primary school.

Summary of Field Investigation

Cardno conducted a field investigation which consisted of advancing 19 test pits, one hand auger and five boreholes across the site. Test pits were advanced a minimum of 0.5 m into natural soils. Boreholes were advanced to depths of up to 17 m within the proposed school building footprint, and depths of 5 m in other areas. Three boreholes were converted into permanent monitoring wells to establish groundwater conditions at the site.

The subsurface profile encountered generally consisted of topsoil and fill material consisting of sands and silty sands to a maximum depth of 1.2 metres below ground level (mBGL), with filling generally observed to be less than 1 m deep. Natural soils encountered generally consisted of sands and silty sands, with intermittent sandy clays present at greater depths. Groundwater was encountered at depths of approximately 3.8 to 4 mBGL.

Summary of Contamination Potential

Based on the site history and results of the intrusive investigation, the potential sources of impacts at the Site included:

- Contamination as a consequence of uncontrolled fill material;
- Contamination as a consequence of demolition of buildings containing hazardous building materials and soil impacts as a consequence of residual demolition waste
- Presence of soil contamination as a consequence of historical spills and leaks

Summary of Results, CSM and Risk Assessment

Groundwater

Cardno installed and sampled three monitoring wells across the Site as part of the intrusive investigation. Concentrations of COPCs within groundwater were generally below the adopted assessment criteria with the exception of copper within MW02. Given that concentrations of copper within site soils were within acceptable criteria, and the urbanized nature of the site and surrounds, the concentrations are likely to be a function of regional groundwater quality rather than a site specific source. The potential risks from groundwater at the Site are considered low and acceptable.

Asbestos in Soils

ACM in the form of fibre cement debris was identified at the soil surface in two locations, beneath turf at TP03, and within shallow fill material at TP04, exceeding the adopted Health Screening Levels (HSLs) and NEPM guidance for continued use as a primary school. The potential area of impact is located in the eastern section of the Site, adjacent to the pre-school boundary fence. The fill material encountered within the area consists of sand and silty sand, with variable depths of between 0.3 and 1.2 mBGL.

Under the current site use, the risk posed to receptors by the soils is considered low. This is due to:

- The material encountered being bonded fibre cement material in fair condition;
- That no further material was encountered at the soil surface; and

- That control air monitoring during disturbance of the soils indicate airborne concentrations were below the exposure standard.

During the proposed development, disturbance of the soils poses a potential low inhalation risk to construction and maintenance workers, site users, and off-site receptors. An Asbestos Management Plan (AMP) should be developed to manage potential risks during construction.

Under the proposed site use, the soils will require remediation, management or risk assessment in order to render the site suitable. Options for remediation or management include consolidation of the material on-site beneath a suitable capping layer or hardstand, or removal from site and disposal at a suitably licenced landfill. If retention of the material on site is preferred, a Long Term Environmental Management Plan (LTEMP) shall be required.

It is Cardno's opinion that the identified impacts can be managed and remedied during development in order to render the site suitable.

Nickel and TRH C_{16}-C_{34}

Concentrations of nickel were detected above the Tier I Site Specific Ecological Investigation Level (EIL) in shallow soils at two locations (TP06_0.1 and TP13_0.1), in addition, hydrocarbon fractions C_{16}-C_{34} were detected at concentrations above the adopted Ecological Screening Level (ESL) in BH04_0.4 for continued use as a primary school.

During development the area characterised by TP06 and TP13 is proposed to be beneath the school building, expanded carpark, or landscaped. The landscaping of the area is indicated to involve removal of surface soils and import of topsoil. The proposed works are likely to remove the nickel containing soils, or mitigate their contact with on-site vegetation. As such, the potential risk posed by the soils to sensitive receptors is considered low.

During development, the area characterised by TRH impacts identified at sample location BH04 is intended to remain as a hardstand area, with installation of subsurface water tanks and concrete slabs. The presence of hardstand is considered to effectively mitigate any potential exposure of ecological receptors to the soils containing hydrocarbons above the adopted screening criteria. As such, the potential risk posed by the soils is considered low.

It is Cardno's opinion that under the proposed development the identified impacts do not pose an unacceptable risk to environmental receptors, and any receptor pathways are likely to be mitigated during the planned redevelopment.

Potential Acid Sulfate Soils

Potential Acid Sulfate Soils (PASS) have been identified at depths of 7 mBGL and greater, associated with natural sands and clays. If these soils are to be disturbed and allowed to oxidise, the potential acid generation poses an environmental risk to ecological receptors such as on-site vegetation and off-site receptors via groundwater. The acid generated also has the potential to degrade structures installed. An Acid Sulfate Soils Management Plan (ASSMP) should be developed to manage the disturbance of these soils by activities such as excavation and piling, or by lowering of the water table.

Recommendations

To manage the potential risks at the Site and validate the suitability of the Site for the continued land use, some remediation, management or risk assessment of the site will be required. Based on the information above, Cardno provides the following recommendations:

- Develop a Remediation Action Plan (RAP) to evaluate the potential management, remediation and / or risk assessment options, detail additional soil sampling rates for data gap investigation, waste classification / re-use requirements and validation criteria to guide and inform the development works. Potential applicable remedial strategies that should be considered include but are not limited to:
  - Site specific human health and ecological risk assessment;
  - Excavation and off-site disposal of impacted soil;
  - Capping with material suitable for the development and future areas of vegetation (potentially 500 mm of clean soil or a suitable depth of hardstand);
- The RAP should also include:

  - An Unexpected Finds Protocol to manage any risks of unidentified impacts such as hazardous materials or waste in fill material;
  - Sampling requirements to classify soil if off-site disposal of soils is required. A suitably qualified Environmental Consultant should be engaged a to undertake sampling at densities in accordance with the NSW EPA *Sampling Design Guidelines* (1995) and/or the NSW EPA *Excavated Natural Material Order* (2014) in order to issue a Waste Classification for the material;
  - If re-use of excavated soils on-site is proposed, validation sampling at a rate consistent with NEPM and / or ENM Order guidance should be undertaken to ensure the soils are suitable for the proposed land-use. The sampling density would be included in the RAP.
- If not incorporated into the RAP, additional management plans should be developed including:
  - An Acid Sulfate Soils Management Plan (ASSMP) detailing the procedure for disturbance of PASS material, and the process for treatment and validation of neutralisation;
  - An Asbestos Management Plan (AMP) detailing the procedure for disturbance of ACM containing soils including control measures and WHS requirements.

Table of Contents

Appendices

Tables

Abbreviations and Units

BTEXN	Benzene, Toluene, Ethyl-benzene, Xylenes and Naphthalene
OCP	Organochlorine Pesticides
OPP	Organophosphate Pesticides
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
VOC	Volatile Organic Compounds

Technical Terms

ACM	Asbestos Containing Material
AGL	Above Ground Level
AHD	Australian Height Datum
AMG	Australian Map Grid
ANZECC	Australian and New Zealand Environment and Conservation Council
AST	Aboveground Storage Tank
BGL	Below Ground Level
CoC	Chain of Custody
CoPC	Contaminants of Potential Concern
DECC	Former Department of Environment and Climate Change NSW
DECCW	Former Department of Environment, Climate Change and Water
DNAPL	Dense Non-Aqueous Phase Liquid
DO	Dissolved Oxygen
DSI	Detailed Site Investigation
EC	Electrical Conductivity
EILs	Environmental Investigation Levels
EPA	Environment Protection Authority
EPL	Environment Protection Licence
GCMS	Gas Chromatograph - Mass Spectrometer
GME	Groundwater Monitoring Event
HILs	Health based Investigation Levels
LNAPL	Light Non-Aqueous Phase Liquid
LOR	Limit of Reporting
N/A	Not Applicable
NAPL	Non-Aqueous Phase Liquid
NEPM	National Environment Protection Measure

OEH	Office of Environment and Heritage
pH_F/pH_{FOX}	Field pH and Field pH Peroxide Oxidation
PID	Photo-ionisation Detector
PQL	Practical Quantitation Limit
PSI	Preliminary Site Investigation
QA	Quality Assurance
QC	Quality Control
RL	Reduced Level
RPD	Relative Percentage Difference
S_{CR}	Chromium Reducible Sulphur
SPOCAS	Suspension Peroxide Oxidation Combined Acidity and Sulphur
UCL	Upper confidence Limit
UST	Underground Storage Tank

Units

Ha	Hectares
mBGL	Metres Below Ground Level
mg/kg	Milligram per Kilogram (approximately equivalent to ppm)
mg/L	Milligram per Litre
mBTOC	Metres Below Top of Casing
ppb	Part per Billion
ppm	Parts per Million
µg/kg	Microgram per Kilogram (approximately equivalent to ppb)
µg/L	Microgram per Litre
µS/cm	Micro Siemens per Centimetre

1 Introduction

1.1 Background

Cardno (NSW/ACT) Pty Ltd ("Cardno") was engaged by DWP Australia Pty Ltd ("the Client") to undertake a Detailed Site Investigation (DSI) for the proposed redevelopment of Kyeemagh Infants School, located on the corner of Jacobson Avenue and Beehag Street, Kyeemagh NSW 2216 ("the Site"). The Site is legally identified as Part Lot 1 within Deposited Plan (DP) 335734 and Lot 1 within DP 120095. The pre-school facility in the eastern portion of the Site is excluded from the scope of investigation. The location and features of the site are presented in **Figures 1** and **2** in **Appendix A.** The DSI has been prepared in accordance with the scope of works presented in Cardno's proposal dated 29 November 2018.

The Department of Education is proposing to redevelop the Site to increase its current capacity from a K-2 capable school to a K-6 capable school. The proposed redevelopment has been assessed as State Significant Development and this DSI has been commissioned to satisfy Item 12.1 of the Secretary's Environmental Assessment Requirements (SEARS) for Application Number SSD 9391, issued under Section 4.12(8) of the *Environmental Planning and Assessment Act* and Schedule 2 of the *Environmental Planning and Assessment Regulation 2000.* The requirements of Item 12 are to assess and quantify any soil and groundwater contamination and demonstrate that the Site is suitable for the proposed use in accordance with *State Environmental Planning Policy No. 55 – Remediation of Land 1998*.

1.2 Purpose and Objectives

The purpose of this DSI is to provide the Client with information on subsurface soil and groundwater conditions at the Site with regards to potential contamination and Acid Sulfate Soils (ASS) which may pose a risk to human health or the environment under the proposed development.

The objectives of the DSI are to:

- Identify the potential for past or present activities on the Site; and to the extent practicable surrounding the Site, to cause contamination of land or groundwater at the Site;
- Identify potential areas and contaminants of concern at the Site;
- Develop a Conceptual Site Model (CSM) incorporating identified impacts (if any) and potential receptors of concern to assess the potential for the protected beneficial uses of the land and groundwater to be impacted due to contamination; and
- Provide recommendations for additional assessment and/or management options if impacted soil and/or groundwater is identified.

1.3 Scope

To meet the DSI objectives Cardno undertook the following scope of work:

- Defined the Site features and immediate surrounds based on site observations during the assessment activities;
- Reviewed available background information for the Site, including searches of public databases;
- Undertook an intrusive investigation which included:
  - Locating services in the assessment area;
  - The advancement of 19 test pits, one hand auger, and five soil borings using an excavator and 4x4 vehicle mounted Drill Techniques D-4T drill rig;
  - Submission of 41 primary soil samples, 37 samples for Acid Sulfate Soils analysis, two fibre cement samples and associated Quality Assurance / Quality Control samples to a NATA accredited laboratory for analysis of:
    - Total Recoverable Hydrocarbons (TRH);
    - Benzene, Toluene, Ethylbenzene, Total Xylenes and Naphthalene (BTEXN);

    - Volatile Organic Compounds (VOCs);
    - Polycyclic Aromatic Hydrocarbons (PAHs);
    - Heavy Metals (Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc);
    - Organochlorine and Organophosphate Pesticides;
    - Polychlorinated Biphenyls (PCBs);
    - Acid Sulfate Soils Field Screening (pH_F/pH_{FOX});
    - Suspension Peroxide Oxidation Combined Acidity and Sulphur (SPOCAS);
    - Chromium Reducible Sulphur (S_{CR}); and
    - Asbestos (weight/weight %).
  - Submission of three primary groundwater samples and associated Quality Assurance / Quality Control samples to a NATA accredited laboratory for analysis of:
    - Total Recoverable Hydrocarbons (TRH);
    - Benzene, Toluene, Ethylbenzene, Total Xylenes and Naphthalene (BTEXN);
    - Volatile Organic Compounds (VOCs);
    - Polycyclic Aromatic Hydrocarbons (PAHs);
    - Heavy Metals (Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc);
    - 28 per- and poly-fluoroalkyl substances (PFAS)
- Development of a conceptual site model (CSM) to evaluate potential risks to identified sensitive receivers;
- Preparation of this DSI report.

1.4 Guidelines and Legislation

The scope of work outlined above was completed in accordance with the requirements included in the following guidelines and legislation:

- ASSMAC (1998) *Acid Sulfate Soils Assessment Guidelines*, Acid Sulfate Soils Management Advisory Committee, August 1998;
- CCME (2010), *Canadian soil quality guidelines: carcinogenic and other polycyclic aromatic hydrocarbons (PAHs) (environmental and human health effects)*, Scientific criteria document (revised), Canadian Council of Ministers for the Environment ,2010
- CRC Care (2011*) Technical Report No. 10 Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater Part 1: Technical Development Document*, September 2011;
- HEPA (2018) *PFAS National Environmental Management Plan*, January 2018;
- NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Measure (NEPM)*. National Environment Protection Council (NEPC) 1999, Amendment 2013;
- NEPC (2013) *Schedule B(2) Guideline on Site Characterisation*, NEPM 1999, Amendment 2013;
- NSW Department of Urban Affairs and Planning (1998) *Managing Land Contamination: Planning Guidelines: SEPP 55 Remediation of Land*, 1998;
- NSW EPA (1995) *Contaminated Sites Sampling Design Guidelines*. New South Wales Environment Protection Authority (EPA), September 1995;
- NSW OEH (2011) *Guidelines for Consultants Reporting on Contaminated Sites*. New South Wales Office of Environment a& Heritage (OEH), November 1997, Reprinted September 2000, Reprinted August 2011;
- Standards Australia (2005) *Australian Standard AS 4482.1-2005 – Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compound*s. Standards Australia, Homebush, NSW; and

- Standards Australia (1999) *Australian Standard AS 4482.2-1999 - Guide to the sampling and investigation of potentially contaminated soil. Part 2: Volatile substances*. Standards Australia, Homebush, NSW.

2 Site Condition and Surrounding Environment

2.1 Site Definition

The site is approximately 8 km south west of the Sydney CBD. The site location and site plan are provided in **Appendix A** with site details presented below in **Table 2-1**.

Table 2-1 Site Definition and Details

Item	Details
Site Address	Corner of Jacobson Avenue and Beehag Street, Kyeemagh NSW 2216
Approximate Site Area (ha)	1.3 ha
Title Details	Lot 1 DP 335734 and Lot 1 DP 120095
Local Government Area	Bayside City Council
Parish and County	St George, Cumberland
Current Site Owners	The Department of Education
Current Site Zoning	R2 Low Density Residential

2.2 Site Description

The Site is currently used as an infant's school and has an area of approximately 1.3 ha. The land parcel is approximately rectangular in shape and is bounded by Jacobson Avenue to the South, Beehag Street to the west, and Tancred Avenue to the east. The northern boundary abuts low density residential housing. The western area of the Site contains the infant's school with classrooms, administrative buildings, amenities and recreation spaces. The centre of the site is primarily an open grassed play area. In the eastern area of the Site North Brighton Preschool occupies an approximately 1,700 m^2 area, which is excluded from the scope of investigation. Figures detailing the Site location and surrounds, and plans for the proposed development are included in **Appendix A**.

Cardno conducted a site inspection on 10 November 2018 during field works. Details of the observations made during the inspection are provided in **Table 2-2** below.

Table 2-2 Site Inspection Observations

Item	Observations
Current site use	Current site use is as an infants school
Proposed site use	Future site use is for redevelopment to remain as a primary school
Site slope and drainage features	Site elevation is approximately 5 mAHD and is relatively level. Local topography is generally level with minor undulations and mounds. Drainage in surrounding streets is expected to be through a pit and pipe network via street guttering.
Vicinity Surface water bodies	The Cooks River is located approximately 240 m east north east of the Site, Botany Bay is located approximately 240 m south east of the Site, and Muddy Creek is located approximately 330 m north west of the Site. Muddy Creek drains into the Cooks River, which flows to Botany Bay.
Site surface coverings	The Site is mostly grassed, with areas of asphalt hardstand in play areas in the south western area of the Site. A graveled carpark is present in the north western corner of the Site accessed via Beehag Street.
Surface soils	Surface soils were visible in areas of sparse grass cover and consisted of sands and silty sands.
Buildings	Eight buildings are present in the western area of the Site which comprise the infants school facilities. Buildings include; ▪ A demountable office and classroom building in the north adjacent the carpark ▪ A metal building housing the Sustainable Community Hub adjacent garden beds south of the office

	▪ A brick library building south west of the office ▪ A brick amenities building south of the office ▪ A clad classroom south of the Beehag Street entrance ▪ Two clad classroom buildings and a clad storage building adjacent the Jacobson Avenue boundary The preschool facility contains additional buildings which are not included within the investigation area.
Potential asbestos in building materials	Potential asbestos containing materials were observed in some buildings generally consisting of wall cladding to the buildings in the south adjacent to Jacobson Avenue.
Manufacturing, industrial or chemical processes and infrastructure	None observed.
Fuel storage tanks (USTs/ASTs)	None observed.
Dangerous goods	None observed.
Solid waste deposition	None observed.
Liquid waste disposal features	None observed.
Evidence of previous site contamination investigations	None observed.
Evidence of land contamination (staining or odours)	Fibre cement material was observed at the soil surface adjacent the access gate in the north eastern corner of the site (**Figure 3, Appendix A**).
Evidence of groundwater contamination	None observed.
Groundwater use	A functioning groundwater bore is present on site reportedly used for irrigation.
Vegetation	Mature trees are present primarily in the western infant's school area, and eastern pre-school area. The remainder of the Site is generally grassed or hardstand. Although grass cover was sparse in some areas, vegetation was generally observed to be healthy. Vegetation is mapped as Urban Exotic / Native (Native Vegetation of the Sydney Metropolitan Area, OEH)
Site fencing	The site is enclosed by a metal security fence on the eastern, western and southern boundaries, and a timber fence on the northern boundary.

2.3 Surrounding Land Uses

Land uses surrounding the site are detailed in **Table 2-3** and a map of the surrounds in shown in **Figure 1**, **Appendix A**.

Table 2-3 Surrounding Land Uses

Direction	Land Use or Activity
North	Low density residential followed by Mutch Avenue, Kyeemagh RSL Club and Muddy Creek
South	Jacobson Avenue followed by low density residential, General Holmes Drive and Botany Bay
East	Tancred Avenue followed by low density residential and the Cooks River, followed by Sydney Airport
West	Beehag Street followed by low density residential

The area is serviced by public roads and access to the site is available from Beehag Street to the west, and via a locked access way at the north eastern corner of the Site leading to Tancred Avenue.

2.4 Proposed Development

The proposed redevelopment aims to address demographic pressures identified in the Kogarah Primary Cluster by expanding the capacity of the school from a K-2 Infants School to K-6 primary school. The proposed school will have a capacity of up to 500 students. The redevelopment involves the demolition of all existing buildings in a staged process to allow the existing school to remain open. The concept design for the proposed development is included in **Appendix A**. New infrastructure includes;

> A main two storey building in the eastern area of the Site adjacent to the pre-school boundary, comprising the majority of the current grassed open area;

> An administration building in the central southern area of the Site;

> Hardstand and a hall building in the south west corner of the Site;

> A games court and refurbished carpark in the north western area of the Site; and

> Landscaping of the remainder of the Site.

2.5 Topography and Drainage

Site elevation is approximately 3 to 5 mAHD and is relatively level with a raised mound south of the Sustainable Community Hub. The local topography is generally flat with minor undulations and mounding. Surface water is expected to generally infiltrate into the sandy soils. Drainage in surrounding streets is by kerbside guttering. Likely stormwater discharge points are the Cooks River and Botany Bay.

2.6 Flood Potential

Cardno undertook a review of available flood mapping of the area surrounding the school in order to provide flooding advice (Cardno, 2018). The Cooks River Flood Study undertaken by Parsons Brinckerhoff for Sydney Water in 2008 indicates that the Site is unlikely to be affected by the 1% AEP or PMP flood events.

2.7 Regional Geology and Hydrogeology

The Soil Landscapes of Sydney Sydney 1:100,000 sheet indicates that the Site soils are likely comprised of Quaternary quartz sands with minor shell content, silt and fine sands (Qhbr). The NSW Office of Environment and Heritage eSPADE online GIS tool indicates that the site is characterised as part of the Tuggerah Soil Landscape, which is an Aeolian landscape with deep sandy soils with pH values ranging from 4.5 (strongly acidic) to 7.0 (neutral).

The site is underlain by the Botany Sands Aquifer which is extensive, porous and highly productive. Groundwater flow is expected to be to the east towards the Cooks River or south towards Botany Bay with local variations in gradient. Due to the proximity of the Site to Muddy Creek, the Cooks River and Botany Bay, groundwater at the Site may be tidally influenced.

2.7.1 Groundwater Database

A search of the NSW Groundwater Database maintained by the Department of Primary industries – Water identified 88 bores within 500m of the site. The purpose of these bores are summarised in **Table 2-4** below.

There are reportedly two bores on-site, with one currently in use:

- GW023455: Private spear for general domestic use installed 01/12/1965. Drilled depth of 4.9mBGL (unlikely to be currently in use)
- GW109028: School bore for high security domestic recreation use installed on 02/12/2002. Drilled depth 8.0 mBGL. Static Water Level 6.0 mBGL (currently in use).
- Static water levels (SWLs) in nearby bores were measured at between 2.44 mBGL and 5.49 mBGL

Table 2-4 Groundwater Summary Table

Intended Purpose	Number of Bores within 500 m
Domestic	81
Irrigation	6
Recreation	1

The majority of groundwater extraction in the surrounding area is for domestic use, likely for garden irrigation.

2.7.2 Acid Sulphate Soils

The Rockdale Local Environment Plan 2011 lists the Site as within a Class 4 Acid Sulfate Soils (ASS) potential area, with a Class 3 area present to the north. There is potential for ASS to be present beneath the Site, and works below 2 m below ground level (mBGL), or which may lower the water table by 2m may pose an environmental risk. As part of this DSI, an investigation into ASS beneath the Site has been undertaken. Some potential indicators of ASS were identified during fieldworks (odour, shell inclusions), and analytical results confirm that Potential Acid Sulfate Soils (PASS) is present at the Site within sands and clays beneath the water table at depths of 7 mBGL and greater. An Acid Sulfate Soils Management Plan (ASSMP) should be developed for the project to manage any disturbance of ASS during works.

2.7.3 Salinity

There is no data on the Salinity Hazard Map generated using the NSW planning Portal, therefore the potential occurrence of saline soil conditions at the Site is considered to be low.

2.8 Previous Reports

Cardno was provided with the following previous reports relating to the Site:

- Parsons Brinckerhoff (PB, 2014a) *Asbestos Remediation Clearance Certificate*. Prepared 9 July 2014.
- Parsons Brinckerhoff (PB, 2014b) *Asbestos in Grounds, Asbestos Management Plan, Kyeemagh Infants School, Kyeemagh, NSW*. Prepared July 2014.

2.8.1 PB 2014a Asbestos Remediation Clearance Certificate

An Asbestos Remediation Clearance Certificate was issued by Parsons Brinckerhoff (PB) following removal of fragments of asbestos cement debris. The report states that on 9 July 2014 Australasian Technical Services Pty Ltd were engaged to remove asbestos cement debris from ground surfaces within a section of the school's grassy play area. The subject area of the report was in the south eastern corner of the Site abutting the preschool boundary fence and Jacobson Avenue boundary fence. Following removal works, the report states that visible materials were removed as far as reasonably practicable. The report excludes all other areas and areas below ground surfaces. Control air monitoring during the works was found to be within acceptable airborne fibre limits. A copy of the report is included within **Appendix C**.

2.8.2 PB 2014b Asbestos in Grounds, Asbestos Management Plan, Kyeemagh Infants School, Kyeemagh, NSW

Following the issue of the Asbestos Remediation Clearance Certificate (PB 2014a) an Asbestos Management Plan for *Asbestos In Grounds* was prepared by PB and issued in July 2014. The report outlines management measures for the identified asbestos impacted areas. The report states that the 'asbestos zone' comprises the PB 2014a subject area, and that asbestos cement fragments may be present as a component of buried fill in this area.

The report states that the site can be defined as low risk provided that the identified material remains undisturbed, and control measures such as regular monitoring and removal of fragments, and capping of the area with turf, mulch or hardstand is maintained.

Section 5 of the report provides a maintenance works management framework. Section 5.2 outlines that if the asbestos zone is to be disturbed, a licensed asbestos removal contractor with a friable licence should be engaged and provide appropriate control measures to ensure personnel and other school users are not exposed. Controls include undertaking works out of school hours, and work in progress asbestos air monitoring, analysed by a NATA accredited laboratory. Following works, management measures must be re-instated. A copy of the report is included within **Appendix C**.

2.9 EPA Records Search

2.9.1 Contaminated Land Record of Notices

The Contaminated Land Record of Notices is maintained by the Office of Environment and Heritage (OEH) in accordance with Part 5 of the Contaminated Land Management (CLM) Act 1997 and contains regulatory notices issued by the Environment Protection Authority (EPA) in relation to contaminated sites. The results of a search of the register indicate there are two sites within a 1 km radius of the site which have been notified to the EPA.

Table 2-5 Records of notice within dataset buffer

Site	Address	Activity	Notices	Distance (m)	Direction
Shell Service Station Brighton Le Sands and adjacent land	2 General Holmes Drive, Brighton Le Sands	Service Station	4 former	960 m from Site	South West of Site
Cook Park	General Holmes Drive, Brighton Le Sands	Service Station	6 former	966 m from Site	South of Site

The potential for the notified sites identified to have impact at the Site is considered low due to the distance, and that they are not currently regulated.

2.9.2 PoEO Public Register

The PoEO Public Register under Section 308 of the Protection of the Environment Operations (PoEO) Act 1997 contains Environment Protection Licences (EPLs), applications and notices issued by the EPA. A search for current licences to identify issues of relevance within a 1km radius zone did not return any active licences. A search for former licenced activities now revoked or surrendered returned six listings within the 1km buffer zone. The majority of these listings relate to general licences for application of herbicides, road construction (M5 Motorway) and water-based extractive activities. A summary of the former licences is contained in **Appendix C**.

The potential for the activities listed to have impact on the site is considered low due to the type of activities (herbicide impacts to waterways, road construction, extractive activities). The potential for diffuse effects will be considered if soil or groundwater impacts are identified.

2.9.3 List of Contaminated Sites Notified to the EPA

In response to 2008 amendments to the *Contaminated Land Management Act* (2008) clarifying the Section 60 duty to report contaminated sites, the EPA has received approximately 1,600 notifications to date from owners or occupiers of sites where they believe the sites are contaminated. Sites appearing on this list indicate that the notifiers consider that the sites are contaminated and warrant reporting to the NSW EPA; however, the contamination may or may not be significant enough to warrant regulation by the NSW EPA. The EPA needs to review and, if necessary, obtain more information before it can make a determination as to whether the sites warrant regulation.

A search of the list of NSW Contaminated Sites identified 2 notified sites within a the 1km radius, listed in the Record of Notices. The results of the search are presented in **Table 2-6** below.

Table 2-6 Records from the NSW EPA Contaminated Land list within buffer zone.

Site	Address	Activity	Management Class	Distance (m)	Direction
Shell Service Station Brighton Le Sands and adjacent land	2 General Holmes Drive, Brighton Le Sands	Service Station	Contamination formerly regulated under the CLM act	960 m from Site	South West of Site
Cook Park	General Holmes Drive, Brighton Le Sands	Service Station	Contamination formerly regulated under the CLM act	966 m from Site	South of Site

The potential for the notified sites identified to have impact at the Site is considered low due to the distance, and that contamination has been addressed.

2.9.4 Underground Petroleum Storage Systems (UPSS)

A search of the UPSS Sensitive Zone dataset maintained by the NSW EPA indicates that the Site is considered to be within a UPSS Sensitive Zone. No evidence of a UPSS was identified at the Site. Results of the search are contained within **Appendix C**.

2.9.5 EPA PFAS Investigation Program

A search of the NSW EPA PFAS Investigation Program dataset indicates that the Site is within 240 m of an EPA PFAS Investigation Program site, being Botany Bay and Georges River. Results of the search are contained within **Appendix C**.

2.10 SafeWork Dangerous Goods

A search of the SafeWork NSW records for the Storage of Schedule 11 Hazardous Chemicals was undertaken for the Site. The results of the search indicate that SafeWork NSW does not hold any records for the Storage of Hazardous Chemicals at the Site. A copy of the response is provided in **Appendix C**.

2.11 Planning Information

The site is zoned as R2 Low Density Residential under the Rockdale LEP 2011.

2.12 Site Historical Uses

Historical Site uses and surrounding land uses observed from historical aerial photographs contained in **Appendix C** are summarised in **Table 2-7** below. Additionally, an article in the St George and Sutherland Shire Leader published in on August 14, 2017 titled '*Kyeemagh Infants School Turns 75*' reports that the school celebrated 75 years of operation in 2017, indicating the Site has been in use as a school since 1942.

A search of historical business directory records for the area surrounding the Site did not identify any listings of concern within proximity to the Site.

Table 2-7 Historical Land Uses

Decade	Site Use	General Surrounding Land Use
1930-1943	▪ An open undeveloped area, potentially grassed	▪ North: Open undeveloped area, potentially paddocks. ▪ South: Open undeveloped area, followed by a road. ▪ East: A road is present east of the Site, followed by an Open undeveloped area.
1943-1951	▪ A building is present in the south western corner of the site, and a smaller shed immediately north. ▪ The remainder of the site appears sparsely grassed / vegetated with some tracks. ▪ The western half of the site appears to be fenced.	▪ North: Open area with some land disturbance / potential farming followed by a road. A house and sheds are present in the far north. ▪ West: Low density residential housing immediately west and market gardens to the north-west. ▪ East: low density residential housing. The current road structure surrounding the Site is in place. ▪ South: low density residential housing and roads.
1951-1955	▪ The Site remains generally unchanged	▪ Surroundings remain generally unchanged
1955-1961	▪ The site has been cleared and additional small buildings are present in the south western corner. A building is now present abutting the centre of the northern site boundary.	▪ As above for south, east and west. ▪ North: The property abutting the northern site boundary has been developed, and appears to be paddocks or sporting greens.
1961-1965	▪ A building is present in the eastern area of the Site in the location of the current pre-school. ▪ Potential car parking is present along the northern site boundary.	▪ As above for south, east and west. ▪ North: the property abutting the northern site has been further developed with a large building present at the corner of Beehag Street and Mutch Avenue.
1965-1982	▪ The site remains relatively unchanged. Hardstand areas are visible between the buildings in the southern corner of the site. ▪ Some established trees are present.	▪ As above for south, east and west. ▪ The reserve adjacent the Cooks River to the north has been developed with a boat ramp.

	▪ The pre-school area is fenced as a separate area.	
1982-1991	▪ The Site remains relatively unchanged. A small building is present similar to the current storage shed. One small building has also been removed.	▪ As above
1991-2009	▪ An additional building is present adjacent the Beehag Street boundary ▪ The building adjacent the northern site boundary has been removed	▪ As above for south, east, west. ▪ The former sporting / recreation facility abutting the northern boundary has been removed and redeveloped into low density housing
2009-present	▪ The demountable office building is now present. The school and site layout resembles the current configuration with the addition of a shaded play area in the centre of the site. ▪ The Sustainable Community Hub was installed in 2017.	▪ As above for north, east, west. ▪ Development of the reserve / Botany foreshore to the south.

3 Data Quality Objectives

3.1 Data Quality Objectives

The NSW EPA (2017) Guidelines for the NSW Site Auditor Scheme (3rd Edition), which is endorsed under s105 of the Contaminated Land Management Act 1997, requires that Data Quality Objectives (DQOs) be prepared for all assessment and remediation programs. The DQO process as adopted by the NSW EPA is described within US EPA (2000) Guidance for the Data Quality Objectives Process and Data Quality Objectives Process for Hazardous Waste Site Investigations.

The DQOs for the site investigation, as detailed within NSW EPA (2006), are summarised in Error! Reference source not found..

Table 3-1 Data Quality Objectives

DQO Step	Description
Step 1 State the Problem	The site is proposed for redevelopment and it is necessary to establish the current soil and groundwater quality at the site. Investigation into soils and groundwater with respect to potential risks to human health and the environment is required to determine if the Site is suitable for the proposed land use. Therefore, 1. A DSI is required to assess the quality of site soils and groundwater, and to assess the potential risks posed to on and off-site receptors under the proposed land use. 2. If subsurface impacts are identified, appropriate remedial measures to make the site suitable cannot be identified until a DSI is completed.
Step 2 Identify the Decisions	The decisions that must be made are: 1. Are site soils suitable for the intended land use/s? 2. What is the risk posed to potential on-site (and off-site) receptors from the concentrations of COPCs identified at the site (if any)? 3. Is remediation or management of site soils necessary to ensure the site is made suitable for the intended land use?
Step 3 Identify Inputs to the Decision	The primary inputs to the decisions described above are: 1. Assessment of soils, with samples collected from a minimum of 23 locations advanced across the site; 2. Assessment of groundwater, with samples collected from three monitoring wells on site; 3. Ensuring a sufficient number of samples are collected, in accordance with regulatory guidelines, to characterise site soils and groundwater; 4. Laboratory analysis of soil and groundwater samples for relevant COPCs, based on historical land use; 5. Assessment of the analytical results against applicable guideline criteria, based on the intended land use/s; 6. Assessment of the suitability of the analytical data obtained, against the Data Quality Indicators (DQIs) outlined below; 7. Aesthetic observations of soils, including odours, staining and waste inclusions; and 8. Aesthetic observations of groundwater, including odours, sheen and light non aqueous phase liquids (LNAPL), if encountered.
Step 4 Define the Study Boundaries	The study site is defined as Kyeemagh Infants School, being parts of Lot 1 DP 335734 and Lot 1 DP 120095. The lateral extent of the study is shown in **Figure 2**, and excludes the New Brighton Preschool. The vertical extent of the soil study extends to the maximum depth encountered as part of this investigation, being 16 mBGL for ASS investigation. The temporal extent of the study is limited to the sampling conducted in 2018.
Step 5 Develop a Decision Rule	The decision rules for the DSI include: ▪ The number of soil sampling points will meet the requirements for a targeted site characterisation outlined in NSW EPA (1995) Sampling Design Guidelines;

DQO Step	Description
	- The number of groundwater samples will be sufficient for site characterization; - Primary, duplicate and triplicate soil and groundwater samples will be analysed at National Association of Testing Authorities, Australia (NATA) accredited laboratories; - Field and laboratory QA/QC results will indicate reliability and representativeness of the data set; - Laboratory Limits of Reporting (LORs) will be below the applicable guideline criteria for the analysed COPC, where possible; - Applicable guideline criteria will be sourced from NEPM (2013) guidelines and other NSW EPA endorsed guidelines (as necessary); - Any soil aesthetic issues will be evaluated including areas of discolouration, odour and hazardous waste inclusions; - Any groundwater aesthetic issues will be evaluated including odours, sheen and LNAPL; - If soil COPCs exceed the applicable guideline criteria, the site will be deemed to potentially contain 'hot spots' of contamination; - If the concentration of a soil and groundwater COPC in a sample is below the applicable guideline criteria, then no further assessment/remediation will be required with respect to that COPC; - If the 95% upper confidence limit (UCL) of a soil COPC is less than applicable guideline criteria, standard deviation is less than 50%, and no reported concentration is greater than 250% of criteria, then no further assessment/remediation will be required with respect to that COPC; and - If the concentration of a soil or groundwater COPC in a sample exceeds the applicable guideline criteria, the additional works (e.g. remediation or quantitative risk assessment) may be required to minimise the risk.
Step 6 Specify Limits on Decision Errors	To ensure the results obtained are reproducible and accurate, a QA/QC plan is incorporated into the sampling and analytical program. DQIs are used to assess the reliability of field procedures and analytical results. In particular, the DQIs within NSW DEC (2006) are used to document and quantify compliance. DQIs are described as follows, and are presented in **Table 3-2** below: 1. Completeness – A measure of the amount of useable data from a data collection activity; 2. Comparability – The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event; 3. Representativeness – The confidence (expressed qualitatively) that data are representative of each media present on the site; 4. Precision – A quantitative measure of the variability (or reproducibility) of data; and 5. Accuracy (bias) – A quantitative measure of the closeness of reported data to the true value. In addition, this step should include the following considerations to quantify tolerable limits: - If 95% upper confidence limits (UCLs) are adopted for a particular soil COPC, a decision can be made based on a 95% probability that the 'true' arithmetic average contaminant concentration within the sampling area will not exceed the value determined by this method. Therefore, the limit on the decision error will be that there is a 5% probability that the calculated arithmetic average contaminant concentration may be incorrect; and - If the minimum soil sampling points required for site characterisation based on detected circular hot spots by using a systematic sampling pattern is adopted (Table A of NSW EPA 1995), a decision can be made based on a 95% confidence of detecting a hot spot of a particular diameter. Therefore, the limit on the decision error will be that there is a 5% probability that a hotspot of a particular diameter may not be detected.
Step 7 Optimise the Design for Obtaining Data	To achieve the DQOs and DQIs, the following sampling procedures will be implemented to optimise the design for obtaining data 1. The number of soil sampling points will meet the requirements required for a targeted site characterisation outlined in Table A of NSW EPA (1995) *Sampling Design Guidelines* 2. Fill and natural soil samples will be collected from a minimum of 23 locations advanced at the site 3. Soil COPCs will be selected based on a review of historical activities at the site 4. Samples were be collected by suitably qualified and experienced environmental consultants 5. Soil samples will be collected and preserved in accordance with relevant standards/guidelines

DQO Step	Description
	6. NATA accredited laboratories will be engaged for analysis of samples 7. Soil observations including odours, staining and PID readings will assist with selection of samples for laboratory analysis 8. Field and laboratory QA/QC procedures will be adopted and reviewed to indicate the reliability of the results obtained.

3.2 Data Quality Indicators

The following Data Quality Indicators (DQIs), referenced in Step 6 in **Table 3-1** have been adopted in accordance with the NSW EPA (2017) Guidelines for the NSW Site Auditor Scheme (3rd Edition). The DQIs outlined in **Table 3-2** assist with decisions regarding the contamination status of the site, including the quality of the laboratory data obtained.

Table 3-2 Data Quality Indicators

DQI	Frequency	Data Acceptance Criteria
Completeness		
Field documentation correct	All samples	All samples
Soil bore logs complete and correct	All samples	All samples
Suitably qualified and experience sampler	All samples	All samples
Appropriate lab methods and limits of reporting (LORs)	All samples	All samples
Chain of custodies (COCs) completed appropriately	All samples	All samples
Sample holding times complied with	All samples	All samples
Proposed/critical locations sampled	-	Proposed/critical locations sampled
Comparability		
Consistent standard operating procedures for collection of each sample. Samples should be collected, preserved and handled in a consistent manner	All samples	All samples
Experienced sampler	All samples	All samples
Climatic conditions (temp, rain etc) recorded and influence on samples quantified (if required)	All samples	All samples
Consistent analytical methods, laboratories and units	All samples	All samples
Representativeness		
Sampling appropriate for media and analytes (appropriate collection, handling and storage)	All samples	All Samples
Samples homogenous	All samples	All Samples
Detection of laboratory artefacts, e.g. contamination blanks	-	Laboratory artefacts detected and assessed
Samples extracted and analysed within holding times	All samples	-
Precision		
Blind duplicates (intra-laboratory duplicates)	1 per 20 samples	30% RPD, then review RPDs >30% would be reviewed in relation to heterogeneity of sample and LOR
Split duplicates (inter-laboratory duplicates)	1 per 20 samples	30% RPD, then review

DQI	Frequency	Data Acceptance Criteria
		RPDs >30% would be reviewed in relation to heterogeneity of sample and LOR
Laboratory duplicates	1 per 20 samples	<20% RPD Result > 20 × LOR <50% RPD Result 10-20 × LOR No Limit when RPD Result <10 × LOR
Accuracy		
Trip blanks	1 per sampling event (as required)	COPCs<LOR
Trip Spikes	1 per sampling event (as required)	70-130%
Surrogate spikes	All organic samples	50-150%
Matrix spikes	1 per 20 samples	70-130%
Laboratory control samples	1 per 20 samples	70-130%
Method blanks	1 per 20 samples	<LOR

4 Soil Assessment Criteria

4.1 Assessment Criteria

The following sections detail the adopted Tier I Screening Values which are compared to the soil and groundwater analytical data included on the summary data tables included in **Appendix D**. The analytical results obtained have been compared to the assessment criteria below.

4.1.1 Soil Assessment Criteria

Based on the proposed redevelopment as a primary school, the criteria for residential land use with accessible soils (A) have been applied. A review of the borehole logs for the site indicates that values for Sands / Coarse soils are applicable:

Assessment criteria for the Site were derived from the following guidelines:

- Total Recoverable Hydrocarbons (TRH), Benzene, Toluene, Ethylbenzene, Xylene, and Naphthalene (BTEXN), Benzo(a)pyrene:
  - NEPM (2013) Health Screening Levels (HSLs) for Vapour Intrusion (VI) and Direct Contact;
  - CRC Care (2011) Soil HSLs for Intrusive Maintenance Workers (Shallow Trench).
  - NEPM (2013) Ecological Screening Levels (ESLs); and
  - CCME (2010) Soil Quality Guidelines (SQGs)
- Heavy metals M8 (Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Mercury, Zinc), Polycyclic Aromatic Hydrocarbons (PAHs), Organochlorine Pesticides, Organophosphorus Pesticides, Polychlorinated Biphenyls, Volatile Organic Compounds (VOCs):
  - NEPM (2013) Health Investigation Level (HILs);
  - NEPM (2013) Generic Ecological Investigation Levels (EILs);
  - Site Specific EILs where applicable calculated via the Ecological Investigation Level Calculation Spreadsheet, developed by CSIRO for the National Environment Protection Council, December 2010.
- Asbestos:
  - Quantification % w/w, Presence / Absence.
- Acid Sulfate Soils (ASS):
  - ASSMAC (1998) Action Criteria – Coarse Soils (<1000t)

4.1.2 Groundwater Assessment Criteria

For the purposes of evaluating groundwater conditions at the site, a review of the potential on-site and off-site groundwater beneficial uses have been conducted. The results of the review are provided in **Table 4-1** below.

Table 4-1 Groundwater Beneficial Uses

Beneficial Use		Likelihood of Use		Comment
		Onsite	Offsite	
Aquatic Ecosystems	Groundwater	N/A	Potential	Aquatic ecosystems are not present on-site. There is potential for groundwater to travel to aquatic ecosystems including the Cooks River and Botany Bay.
Human Uses	Potable Water	Unlikely	Unlikely	Groundwater use on-site and surrounding the site is generally for domestic use, likely irrigation. Potable water supply is via reticulated water, and stock watering is unlikely given the surrounding land uses.
	Primary /Secondary Contact Recreation / Aesthetic	Unlikely	Unlikely	
	Irrigation	Likely	Likely	

Beneficial Use		Likelihood of Use		Comment
		Onsite	Offsite	
	Stock Watering	Unlikely	Unlikely	
	Industrial Use	Unlikely	Unlikely	
	Aquaculture	Unlikely	Unlikely	
Buildings and Structures		Refer Comment	Refer Comment	
Intrusive Maintenance / Trench / Excavation Worker		Potential	Potential	Groundwater may be encountered during trenching, excavation and piling works.

Based on a review of the beneficial uses, the groundwater analytical results will be compared to applicable guideline criteria for protection of marine aquatic ecosystems, recreational use, and irrigation due to the on-site use for irrigation and potential flow towards the Cooks River and Botany Bay. As such, the groundwater analytical results will be compared to the following assessment criteria:

> Heavy Metals, Benzene, Xylenes, Naphthalene, VOCs:
  - NEPM1999 Groundwater Investigation Levels (GILs) for marine waters (95%).
  - ANZECC 2000 Australian Water Quality Guidelines for Fresh and Marine Waters: Irrigation Long-Term Trigger Values.

> TRH and BTEX:
  - NEPM Groundwater HSLs for vapour intrusion for low-high density residential land use (HSL A&B). A review of the depth to groundwater and excavation depth at the site indicates that the Sand HSLs at depths between 4 m to 8 m are applicable.

> Per- and poly-fluoroalkyl substances (PFAS)
  - PFAS NEMP (2018) Interim Marine (95%) and Recreational Water.

5 Soil Investigation Program

5.1 Site Investigation Methodology

The scope and method of the work is summarised in **Table 5-1** below. Sampling locations are shown on **Figure 2**, **Appendix A** and collected samples and analysis are summarised in **Table 5-3**. Fieldwork was undertaken by an experienced Cardno environmental scientist and geotechnical engineer in accordance with the agreed scope of work per the procedures in **Table 5-1**, below. Laboratory analytical summary tables are included in **Appendix D** and borehole logs are provided in **Appendix E**.

In accordance with the PB 2014b Asbestos Management Plan, works were undertaken outside of school hours. During disturbance of the 'asbestos zone' adjacent the preschool, a licenced Class A asbestos removalist was engaged (Australasian Technical Services Pty Ltd). Work in progress air monitoring was undertaken by EnviroX Consulting, and a clearance certificate issued for the area disturbed following works. A copy of the clearance certificate is provided in **Appendix C**.

Table 5-1 Investigation Activity Summary

Activity	Details
Dates of Field Activity	08/11/2018, 10/11/2018, 17/11/2018, 23/11/2018
Service Location	Conducted a Dial Before You Dig search and engaged a qualified service locator to mark services and clear borehole locations prior to ground penetration.
Intrusive Works	Non-destructive drilling (hand auger) within high risk zone followed by drilling using a 4x4 vehicle mounted Drill Techniques D-4T drill rig with solid flight augers and wash boring, and test pits using a 5t excavator.
Bores, Test Pits and Target Depths	Fieldworks for soil sampling and monitoring well installation were undertaken on 10 and 17 November 2018: ▪ 19 test pits and one hand auger were advanced across the site into natural soils; ▪ Five boreholes were drilled to varying depths between 5 mBGL and 17.95 mBGL ▪ Three boreholes were converted into permanent groundwater monitoring wells. Well construction details are included in **Appendix E.** ▪ After the monitoring wells were installed they were developed by pumping approximately 80 litres of groundwater from each well.
Soil Logging	Soils encountered during drilling were described and logged. Borehole logs are presented in **Appendix E.**
Soil Sampling	A total of 41 primary soil samples, two fibre cement samples and 37 samples for ASS analysis were submitted for analysis from the 19 test pits, one hand auger and five boreholes advanced across the site excluding QA/QC samples. Samples were collected by gloved hand using nitrile gloves. Samples from test pits were collected from material that had not been in contact with the excavator bucket. Samples from boreholes were collected from the auger return. Samples at depth for ASS screening were collected from the Standard Penetration Test return. Samples for asbestos in soil were based on collecting 500mL of representative soil for each target interval for screening of asbestos content (% weight/weight) Primary soil samples and two intra-laboratory duplicated were analysed by Eurofins mgt for COPCs as per **Table 5-3**. Two triplicate samples were sent to ALS Environmental and analysed for the same COPCs.
Groundwater Sampling	Three primary groundwater samples, one intra-laboratory duplicate and one inter-laboratory triplicate sample were collected from the monitoring wells on 23 November 2018. The groundwater wells were developed as noted above and purged approximately one week later using low flow purging equipment with dedicated tubing. During purging, groundwater quality parameters including pH, dissolved oxygen, electrical conductivity, oxidation-reduction potential, and temperature were recorded. Groundwater was sampled once the water quality parameters stabilised. Groundwater purging logs are included in **Appendix D**.

	The primary groundwater samples and intra-laboratory duplicate was sent to Eurofins mgt for analysis on the contaminants of potential concern (CoPC) as per **Table 5.2**. The triplicate groundwater sample was submitted to ALS for analysis of the same COPCs.
Sample Preservation and Transport	Samples were placed in laboratory supplied containers and stored on ice in an ice box while on Site and in transit to the laboratory under Chain of Custody (CoC) documentation. Samples for ASS screening and analysis were frozen prior to dispatch. CoC documentation is presented in **Appendix F**.
Borehole and Test Pit Re-instatement	Boreholes and test pits for sampling were backfilled with soil removed from the bore during drilling where possible. Where additional backfill was required washed sand was used. Locations in grassed areas were capped with turf removed prior to drilling, or with new turf in the case of TP03.

The coordinates of the soil samples collected during the investigation program are included in **Table 5-2** below. A summary of the soil samples is included in **Table 5-2** below. Tabulated summaries of laboratory results are presented in **Appendix D**. Copies of the NATA stamped laboratory reports and chain of custody documentation are included in **Appendix F**. The Quality Assurance/Quality Control program is discussed in **Appendix G**.

Table 5-2 Soil Sample Locations

Borehole ID	Easting	Northing	RL (m AHD)
BH01	330214.784390157	6241985.38888958	3.482560902
BH02	330176.890083148	6242025.4168091	4.603321871
BH03	330180.727843445	6241985.26691309	3.829202915
BH04	330148.524206037	6241928.78947002	4.380349699
BH05	330122.664385726	6241978.06358734	4.555388904
TP01	330227.253574592	6242029.99716608	3.652436884
TP02	330192.092346145	6242039.0284916	4.402758435
TP03	330228.407901175	6241971.87488026	3.532988047
TP04	330198.654486418	6241996.98876323	3.769962181
TP05	330186.399446727	6242012.08943301	3.887581294
TP06	330155.727611612	6242007.80251647	4.442983868
TP07	330162.62287691	6241997.83746968	4.288093089
TP08	330188.74141962	6241968.68063922	3.758432115
TP09	330207.989146137	6241962.19764201	3.525020347
TP10	330193.667881051	6241942.11731322	3.710534554
TP11	330167.252254299	6241958.12709222	4.61879868
TP12	330152.537040247	6241973.13200167	4.271883799
TP13	330137.433438883	6241991.72065215	4.542154508
TP14	330142.189179353	6241959.19530421	4.911706657
TP15	330150.379169589	6241948.33761529	4.99423734
TP16	330180.463340772	6241928.57758081	4.508043814
TP17	330154.017918912	6241906.03962298	6.364304828
TP18	330099.890302882	6241951.4864973	5.418704539
TP19	330217.845050392	6241986.92682675	3.463848467
TP20	330126.99801036	6241934.95488447	5.356861049

Table 5-3 Summary of Soil Samples and Analysis

Sample ID	Date	Laboratory Analysis
TP01_0.2	10/11/2018	TRH/BTEXN/PAH/Metals 8/Asbestos (w/w%)
TP01_0.9	10/11/2018	TRH/BTEXN/PAH/Metals 8
TP02_0.1	10/11/2018	TRH/BTEXN/PAH/Metals 8/OCP/OPP/PCB/Asbestos (w/w%)
TP02_0.4	10/11/2018	TRH/BTEXN/PAH/Metals 8/Asbestos (w/w%)
TP03_ASB1	10/11/2018	Asbestos Presence / Absence
TP03_0.2	10/11/2018	TRH/BTEXN/PAH/Metals 8/OCP/OPP/PCB/Asbestos (w/w%)
TP03_1.2	10/11/2018	TRH/VOC/PAH/Metals (8)
TP04_0.1	10/11/2018	TRH/BTEXN/PAH/Metals 8/OCP/OPP/PCB/Asbestos (w/w%)
TP05_0.1	10/11/2018	TRH/BTEXN/PAH/Metals 8/Asbestos (w/w%)
TP05_0.9	10/11/2018	TRH/VOC/PAH/Metals (8)/NEPM Screen for Soil Classification
TP06_0.1	10/11/2018	TRH/BTEXN/PAH/Metals 8/Asbestos (w/w%)
TP06_0.3	10/11/2018	TRH/VOC/PAH/Metals (8)
TP07_0.1	10/11/2018	TRH/BTEXN/PAH/Metals 8/Asbestos (w/w%)
TP07_0.4	10/11/2018	TRH/BTEXN/PAH/Metals 8/NEPM Screen for Soil Classification
TP07_0.6	10/11/2018	TRH/BTEXN/PAH/Metals 8
TP08_0.4	10/11/2018	TRH/VOC/PAH/Metals (8)
TP09_0.3	10/11/2018	TRH/BTEXN/PAH/Metals 8/Asbestos (w/w%)
TP10_0.1	10/11/2018	TRH/BTEXN/PAH/Metals 8
TP11_0.2	10/11/2018	TRH/BTEXN/PAH/Metals 8/OCP/OPP/PCB/Asbestos (w/w%)
TP11_1.2	10/11/2018	TRH/VOC/PAH/Metals (8)
TP12_0.2	10/11/2018	TRH/BTEXN/PAH/Metals 8/OCP/OPP/PCB/Asbestos (w/w%)/NEPM Screen for Soil Classification
TP13_0.1	17/11/2018	TRH/BTEXN/PAH/Metals 8/OCP/OPP/PCB/Asbestos (w/w%)
TP13_0.4	17/11/2018	Asbestos (w/w%)
TP14_0.1	17/11/2018	Asbestos (w/w%)
TP14_0.7	17/11/2018	TRH/VOC/PAH/Metals (8)
TP15_0.1	17/11/2018	TRH/BTEXN/PAH/Metals 8
TP15_0.6	17/11/2018	TRH/VOC/PAH/Metals (8)/OCP/OPP/PCB
TP16_0.1	17/11/2018	TRH/BTEXN/PAH/Metals 8
TP16_0.8	17/11/2018	TRH/VOC/PAH/Metals (8)
TP17_0.5	17/11/2018	TRH/VOC/PAH/Metals (8)
TP18_0.1	17/11/2018	TRH/VOC/PAH/Metals (8)/OCP/OPP/PCB
TP18_0.4	17/11/2018	TRH/VOC/PAH/Metals (8)
TP19_0.1	10/11/2018	TRH/BTEXN/PAH/Metals 8/Asbestos (w/w%)
TP19_0.3	10/11/2018	TRH/BTEXN/PAH/Metals 8/Asbestos (w/w%)
TP20_0.1	17/11/2018	TRH/BTEXN/PAH/Metals 8/OCP/OPP/PCB/Asbestos (w/w%)
QA100	10/11/2018	OCP/OPP/PCB/TRH/VOC/PAH/Metals (8)
QA200	10/11/2018	OCP/OPP/PCB/TRH/VOC/PAH/Metals (8)
QA300	17/11/2018	TRH/BTEXN/PAH/Metals 8
QA400	17/11/2018	TRH/BTEXN/PAH/Metals 8
ASB2	17/11/2018	Asbestos Presence / Absence

BH01_1.0-1.45	10/11/2018	pH_F/pH_{FOX}/S_{CR}/SPOCAS
BH01_2.5-2.95	10/11/2018	pH_F/pH_{FOX}
BH01_4.0-4.45	10/11/2018	pH_F/pH_{FOX}
BH01_5.5-5.95	10/11/2018	pH_F/pH_{FOX}
BH01_7.0-7.45	10/11/2018	pH_F/pH_{FOX}
BH01_8.5-8.95	10/11/2018	pH_F/pH_{FOX}/S_{CR}/SPOCAS
BH01_10.0-10.45	10/11/2018	pH_F/pH_{FOX}/S_{CR}/SPOCAS
BH01_11.0-11.45	10/11/2018	pH_F/pH_{FOX}
BH01_13.0-13.45	10/11/2018	pH_F/pH_{FOX}
BH01_14.5-14.95	10/11/2018	pH_F/pH_{FOX}
BH01_16.0-16.45	10/11/2018	pH_F/pH_{FOX}/S_{CR}/SPOCAS
BH02_0.5	17/11/2018	TRH/BTEXN/PAH/Metals 8/Asbestos (w/w%)
BH02_1.0	17/11/2018	TRH/VOC/PAH/Metals (8)
BH02_2.0-2.45	17/11/2018	pH_F/pH_{FOX}
BH02_4.0-4.45	17/11/2018	pH_F/pH_{FOX}/S_{CR}/SPOCAS
BH02_5.5-5.95	17/11/2018	pH_F/pH_{FOX}
BH02_7.0-7.45	17/11/2018	pH_F/pH_{FOX}/S_{CR}/SPOCAS
BH02_8.5-8.95	17/11/2018	pH_F/pH_{FOX}
BH02_10.0-10.45	17/11/2018	pH_F/pH_{FOX}
BH02_11.5-11.95	17/11/2018	pH_F/pH_{FOX}/S_{CR}/SPOCAS
BH02_13.0-13.45	17/11/2018	pH_F/pH_{FOX}
BH02_14.5-14.95	17/11/2018	pH_F/pH_{FOX}
BH02_16.0-16.45	17/11/2018	pH_F/pH_{FOX}
BH02_17.5-17.95	17/11/2018	pH_F/pH_{FOX}
BH03_0.5	17/11/2018	TRH/BTEXN/PAH/Metals 8/Asbestos (w/w%)
BH03_1.0-1.1	17/11/2018	pH_F/pH_{FOX}
BH03_2.5-2.95	17/11/2018	pH_F/pH_{FOX}
BH03_4.0-4.45	17/11/2018	pH_F/pH_{FOX}
BH03_5.5-5.95	17/11/2018	pH_F/pH_{FOX}
BH03_7.0-7.45	17/11/2018	pH_F/pH_{FOX}
BH03_8.5-8.95	17/11/2018	pH_F/pH_{FOX}/S_{CR}/SPOCAS
BH03_10.0-10.45	17/11/2018	pH_F/pH_{FOX}/S_{CR}/SPOCAS
BH03_11.5-11.95	17/11/2018	pH_F/pH_{FOX}
BH03_13.0-13.45	17/11/2018	pH_F/pH_{FOX}
BH04_0.4	10/11/2018	TRH/BTEXN/PAH/Metals 8
BH04_0.5-0.95	10/11/2018	pH_F/pH_{FOX}/S_{CR}/SPOCAS
BH04_2.0-2.45	10/11/2018	pH_F/pH_{FOX}/S_{CR}/SPOCAS
BH04_3.0-3.45	10/11/2018	pH_F/pH_{FOX}
BH05_0.2-0.5	10/11/2018	TRH/VOC/PAH/Metals (8)
BH05_1.5-1.95	10/11/2018	pH_F/pH_{FOX}/S_{CR}/SPOCAS
BH05_3.0-3.45	10/11/2018	pH_F/pH_{FOX}
BH05_4.5-4.95	10/11/2018	pH_F/pH_{FOX}

Groundwater		
MW01	23/11/2018	TRH/VOC/PAH/Metals (8)/28 PFAS including PFOA/PFOS
MW02	23/11/2018	TRH/VOC/PAH/Metals (8)/ 28 PFAS including PFOA/PFOS
MW03	23/11/2018	TRH/VOC/PAH/Metals (8)/ 28 PFAS including PFOA/PFOS
QA100	23/11/2018	TRH/VOC/PAH/Metals (8)/ 28 PFAS including PFOA/PFOS
QA200	23/11/2018	TRH/VOC/PAH/Metals (8)/ 28 PFAS including PFOA/PFOS

5.2 Field Observations

Subsurface conditions observed during the soil sampling program are summarised in **Table 5-4** below. Surface coverings primarily consist of grass, and asphalt in footpaths and hardstand areas. Depth profiles were generally consistent across the Site with some variation in fill depth and profile. Detailed soil descriptions are provided in the borehole logs (**Appendix E**).

Table 5-4 Typical Soil Profile

Subsurface Horizon	Typical Depth Range (mBGL)	Description
Topsoil	0.0 – 0.2	Fine to medium grained Sands and Silty Sands
Fill	0.2 – 0.5	Fine to medium grained Sands, Silty Sands and Gravelly Sands. Sporadic areas of deeper fill observed in TP03 (1.2 mBGL).
Residual Soil	0.5 – >17.0	Fine to medium grained Sands and Silty Sands. Areas of Silty and Sandy Clay observed in deeper boreholes; BH01 (7.38 mBGL), BH02 (8.5 mBGL) and BH03 (8.2 mBGL)
Rock	-	Not encountered during investigation
Groundwater	≈ 3.8 (mBTOC)	Pale Yellow, Low Turbidity

Additional observations for Kyeemagh Infants School include:

- Asbestos Containing Material (ACM) in the form of fibre cement debris in fair condition was observed at the soil surface in two locations abutting the pre-school boundary fence in the east of the Site (ASB1 and ASB2 in **Figure 3, Appendix A**).
- ACM in the form of fibre cement debris in fair condition was observed in two test pits. Debris was observed at TP03 at the soil surface beneath turf, and at TP04 within fill material.

5.3 Laboratory Soil Results

The results of laboratory analysis have been compared against the adopted assessment criteria. Summarised analytical results are presented in **Appendix D**. An interpretation of this data is summarised as follows:

- Field Screen (PID):
  - PID readings ranged from 0.0 ppm to a maximum of 8.3 ppm at TP02_0.4. Values observed were generally low between 0.5 and 5 ppm.
- Benzene, Toluene, Ethylbenzene, and Xylene (BTEX):
  - Concentrations were not detected above the laboratory limits of reporting (LOR) or adopted criteria within the analysed samples.
- Total Recoverable Hydrocarbons (TRH):
  - TRH fractions C_6 to C_{10} and >C_{10}-C_{16} were not detected above the laboratory LOR or adopted criteria in any analysed sample.
  - TRH fractions >C_{16} to C_{34} were generally reported below the laboratory LOR and adopted criteria with the exception of the following:

    - Concentrations of >C_{16} to C_{34} were detected above the adopted NEPM ESL (300 mg/kg) within samples BH04_0.4 and TP06_0.1. The maximum concentration detected was 1200 mg/kg at BH04_0.4.
    - A 95% Upper Confidence Limit (95% UCL) was undertaken for samples less than 2.5 times the ESL (excluding BH04_0.4). The 95% UCL was calculated to be 123.8 mg/kg and a Standard Deviation of 53.5, below the adopted ESL.
  - Concentrations of TRH fractions C_{34} to C_{40} were detected at concentrations above the laboratory LOR but below adopted criteria.
- Metals:
  - Concentrations were generally reported above the laboratory LORs but below adopted criteria with the exception of the following:
    - Concentrations of nickel were detected above the Site Specific EIL (8 mg/kg) in samples TP01_0.2, TP02_0.1, TP02_0.4, TP06_0.1, TP06_0.3 and TP13_0.1. The maximum concentration detected was 130 mg/kg at TP06_0.1;
    - A 95% UCL was calculated for sample concentrations less than 2.5 times the EIL (excluding samples TP06_0.1 and TP13_0.1), with a reported result of 6.93 and a Standard Deviation of 3.7, below the adopted EIL.
- Polycyclic Aromatic Hydrocarbons (PAHs):
  - Concentrations were detected above the laboratory limits of reporting (LOR) but did not exceed adopted screening criteria.
- Organophosphorus / Organochlorine Pesticides (OCPs/OPPs)
  - Concentrations of OCPs were detected above the laboratory LORs but below adopted criteria;
  - Concentrations of OPPs were not detected above the laboratory LOR or adopted criteria in any analysed sample.
- Polychlorinated Biphenyls (PCBs):
  - Concentrations of PCBs were not detected above the laboratory LOR or adopted criteria in any analysed sample.
- Asbestos:
  - Asbestos was generally not detected within analysed samples within the exception of the following:
    - Chrysotile asbestos was detected in fibre cement fragments above the adopted NEPM HSL (0.05% w/w) within sample TP04_0.4 with an estimated concentration of 0.19% w/w;
    - Chrysotile asbestos was detected within fibre cement samples TP03_ASB1 collected beneath turf, and ASB2 collected at the soil surface.
- Acid Sulfate Soils:
  - Field pH (pH_F) results ranged from 4.9 (acidic) to 9.6 (highly alkaline), indicating Actual ASS (AASS) are unlikely to be present;
  - Field pH Peroxide (pH_{FOX}) results ranged from 2.3 (highly acidic) to 7.9 (slightly alkaline);
  - The results of subsequent SPOCAS and S_{CR} testing revealed Potential Acid Sulfate Soils (PASS) were not likely to be present with the exception of the following:
    - Oxidisable Sulfur (as Chromium Reducible Sulfur) exceeded the adopted action criteria (0.03% S) in samples BH01_8.5-8.95, BH01_1.0-10.45, BH01_16.0-16.45, BH02_7.0-7.45, BH02_11.5-11.95, BH03_8.5-8.95, and BH03_10.0-10.45;
    - In some cases, Acid Neutralising Capacity (ANC) in excess of the acid generation potential was observed, however samples BH01_16.0-16.45 and BH03_10.0-10.45 returned Net Acidity results above the action criteria of 0.3%S indicating the potential need for treatment if exposed.

- An indicative liming rate of up to 8.8 kg/tonne is likely to be required to neutralise any acid generating capacity within the soils.

Table 5-5 Summary of Soil Exceedances

Analyte	Sample I.D.	Reported Concentration	Adopted Criteria
TRH C_{16}-C_{34}	BH04_0.4	1,200 mg/kg	NEPM ESL: 300 mg/kg
Nickel	TP06_0.1 TP13_0.1	130 mg/kg 30 mg/kg	Site Specific EIL: 8 mg/kg
Asbestos (in soil)	TP04_0.4	0.19% w/w	NEPM HSL: 0.01% w/w
Asbestos (soil surface)	TP03_ASB1 ASB2	Chrysotile asbestos detected within fibre cement fragments	NEPM: Soil surface to be free of asbestos
Potential Acid Sulfate Soils	BH01_8.5-8.95 BH01_10.0-10.45 BH01_16.0-16.45 BH02_7.0-7.45 BH02_11.5-11.95 BH03_8.5-8.95 BH03_10.0-10.45	0.34%S 0.16%S 0.05%S 0.13%S 0.082%S 0.29%S 0.35%S	Oxidisable Sulphur (S_{CR}) / Net Acidity – 0.03% S

5.4 Laboratory Groundwater Results

The results of laboratory analysis have been compared against the adopted assessment criteria and presented in **Appendix D**. An interpretation of this data is summarised as follows:

- TRH:
  - Concentrations were not detected above laboratory LOR or the adopted assessment criteria in any analysed sample.
- BTEX:
  - Concentrations were not detected above laboratory LOR or the adopted assessment criteria in any analysed sample.
- PAHs:
  - Concentrations were not detected above laboratory LOR or the adopted assessment criteria in any analysed sample.
- VOCs:
  - Concentrations were not detected above laboratory LOR or the adopted assessment criteria in any analysed sample.
- Metals:
  - Concentrations were reported above the laboratory LOR but below adopted criteria with the exception of the following:
    - Concentrations of copper were detected marginally above the NEPM Marine 95% GILs (0.0013 mg/L) in sample MW02 (0.002 mg/L).
- PFAS:
  - Concentrations were detected above the laboratory LOR but below the adopted assessment criteria.

Table 5-6 Summary of Groundwater Results Exceeding the Adopted Assessment Criteria

Analyte	Sample ID	Reported Concentration (mg/L)	Reported Concentration (mg/L)
Copper	MW02	0.002 mg/L	NEPM GILs (Marine 95%): 0.0013 mg/L

5.5 Site Hydrology

Table 5-7 Site Hydrology

Component	Description
Depth to Groundwater	SWL was recorded at between 3.8 and 3.9 mBTOC.
LNAPL	None observed
Inferred Flow Direction	East-south east towards Cooks River and Botany Bay with localized gradients in varying directions and potential tidal variation.
Inferred Aquifer Conductivity	High
Water Bearing Unit	Shallow sand aquifer
Potential Groundwater Discharge Zones	The Cooks River (240 m east-north east), Botany Bay (240 m south east)

Table 5-8 Monitoring Well Construction

Monitoring Well ID	Installation Date	Total Depth (mbgl)	Screening Interval (mbgl)	Depth to water (bBTOC)
MW01 (BH05)	10/11/2018	4.72	2.0-5.0	3.87
MW02 (BH02)	17/11/2018	17.32	2.0-5.0	3.98
MW03 (BH01)	10/11/2018	14.47	2.0-5.0	3.85

Table 5-9 Groundwater Purging Parameters

Monitoring Well ID	Dissolved Oxygen (DO) (mg/L)	Electrical conductivity (EC) (µS/cm)	pH	Redox potential (Eh) (mV)	Temp (°C)	Purge volume (L)	Water colour
MW01	0.98	270	7.0	75.3	19.9	8	Light Yellow
MW02*	0.7	331	6.9	-41.2	19.2	10	Light Yellow
MW03	0.56	214	6.5	-127.4	18.9	10	Light Yellow

*Purging parameters are indicative only due to equipment malfunction during purging.

6 Quality Assurance / Quality Control

6.1 Field QA/QC Evaluation

The QA/QC samples collected for the sampling program are summarised in **Table 5-6**. The calculated Relative Percentile Differences between primary and duplicate / triplicate samples, trip blank, spike and rinsate results are presented in **Appendix D**.

Table 6-1 Summary of Field QA/QC Samples

Sample Type	Matrix	Primary Sample	Duplicate I.D.	Triplicate I.D.
Field Duplicate / Triplicate	Soil	TP12_0.2	QA100	QA200
		TP16_0.1	QA300	QA400
Field Duplicate / Triplicate	Water	MW02	QA100	QA200
Trip Blank / Trip Spike	Soil	TB / TS	-	-
Rinsate Sample	Water	KYE_RIN	-	-
Drilling fluid emulsion sample	Water	KYE_GUM	-	-

6.2 Laboratory QA/QC

In accordance with Cardno's Quality Assurance and Quality Control (QA/QC) procedures and AS4482.1 (2005), samples were stored in insulated transport containers containing ice and delivered to the designated laboratories under Chain of Custody documentation following sample collection. Chain of Custody records are included in **Appendix F**. Eurofins MGT and ALS Environmental, the chosen analytical laboratories, undertook internal QA/QC procedures which include the analysis of method blanks, internal duplicate samples, laboratory control samples, matrix spikes and surrogate recovery. Additionally, laboratory QA/QC procedures include sample receipt, logging, storage, preservation and analysis within the method specified holding time.

A review of the laboratory analytical data indicated that:

- Laboratory analysis of samples was undertaken by a NATA accredited laboratory
- The laboratory limits of reporting (LOR) were below the adopted criteria
- Samples were extracted and analysed within holding times
- Analyte percentage recoveries in surrogate samples were within acceptance limits
- Analyte concentrations in laboratory method blanks were generally within acceptance limits
- Relative Percent Differences (RPD) between the laboratory parent samples and duplicate samples were generally within acceptance limits, some outliers exist for results for TRH C_{15}-C_{28}, TRH C_{29}-C_{36}, and C_{16}-C_{34}. These outliers are qualified as being within Eurofins and Cardno's overall acceptance requirements.
- Analyte percentage recoveries in laboratory control samples were within acceptance limits
- Analyte percentage recoveries in laboratory spikes were within acceptance limits.

6.3 Data Useability

The data validation procedure employed in the assessment of the field and laboratory QA/QC data indicated that the reported analytical results are representative of the conditions at the sample locations and that the analytical data can be relied upon for the purpose of these investigative works. It is concluded that overall the quality of the analytical data produced is reliable for the purposes of making decisions regarding site contamination.

7 Indicative Waste Classification

The soils sampled during the investigation were compared to the NSW EPA's *Waste Classification Guidelines* (2014). Analytical summary tables are presented within **Appendix D**. The findings of the indicative waste classification are as follows.

7.1 Area Excluding TP03 and TP04

Fill material and soils encountered from depths of 0.0 mBGL to a maximum depth of 1.0 mBGL, excluding the area surrounding TP03 and TP04 generally meet the requirements for classification as General Solid Waste (non-putrescible). The following should be noted:

> One sample (BH4_0.4) exceeded the Contaminant Threshold 1 (CT1) criteria for benzo(a)pyrene (0.8 mg/kg) with a reported concentration of 0.9 mg/kg. However, a 95% Upper Confidence Limit calculated for the fill unit indicates an overall concentration of 0.53 mg/kg with a Standard Deviation of 0.07, below the CT1 criteria.

> One sample (BH06_0.1) exceeded the CT1 criteria for nickel (40 mg/kg) and chromium (100 mg/kg) with concentrations of 130 mg/kg. A 95% UCL was calculated for the fill unit, with a reported chromium result of 22.9 mg/kg with a Standard Deviation of 19.9, and nickel result of 29.7 mg/kg with a Standard Deviation of 23.1, both below the CT1 criteria.

The UCL calculations are provided in **Appendix D**. During construction, it is recommended that Toxicity Characteristic Leaching Procedure (TCLP) testing is undertaken for nickel and chromium as part of the waste classification exercise to determine the final classification of the material.

7.2 Area Characterised by TP03 and TP04

Fill material encountered from depths of 0.0 mBGL to a maximum depth of 1.2 mBGL surrounding TP03 and TP04 and extending to BH02 generally meet the requirements for classification as Special Waste – Asbestos (mixed with General Solid Waste) due to the presence of asbestos at TP03, TP04 and at the soil surface.

7.3 Natural Soils

Natural soils at depths of 7 mBGL and greater are considered to be classified as PASS, and require management if they are to be disturbed. The soils will require treatment to neutralise any acid generating potential. Following treatment, validation sampling by a suitably qualified Environmental Consultant to confirm the neutralisation process and chemical concentrations will be required to produce a Waste Classification Certificate for the material.

For natural soils above the water table, sampling in accordance with the NSW EPA *Excavated Natural Material Order* (2014) can be considered following removal of identified impacted fill material to determine whether the soils meet the criteria for resource recovery under the NSW EPA *Excavated Natural Material Exemption* (2014).

7.4 Potential for On-Site Re-Use

The soils sampled during the investigation generally meet the requirements for re-use within the Site with specific exceptions and stipulations as described in the following section. General conditions for the re-use of within the Site include:

> The soils should meet aesthetic guidelines for use near surface and not exhibit waste or deleterious inclusions, discolouration or generate odour;

> A management plan should be developed addressing any health and safety issues associated with disturbing soils containing COPCs such as asbestos;

> The soils must meet the geotechnical requirements for the particular use, as stipulated and verified by a qualified Geotechnical Engineer;

> Use of the soils at shallow depths within the root zones of plants is subject to their acceptability as a growth medium; and

> During development, a soil validation sampling program should be undertaken of excavated soils for re-use at sampling densities in keeping with NEPM guidance.

Subject to the above, the following should be considered for re-use of material on-site:

- Soils exceeding Tier I HSLs for asbestos surrounding TP03 and TP04 may require management. This may include placement of the material beneath hardstand or a capping layer which physically separates the material from sensitive receptors. If the material is to be retained on-site, a Long Term Environmental Management Plan (LTEMP) may be required.
- Soils exceeding Tier I EILs / ESLs for nickel and TRH C_{16}-C_{34} may require management if to be re-used on site. This may include placement of the material beneath hardstand or a capping layer which physically separates the material from sensitive receptors. If the material is to be retained on-site, a Long Term Environmental Management Plan (LTEMP) may be required.
- Soils found to be PASS will require treatment to neutralise any acid generating potential, followed by validation sampling by a suitably qualified Environmental Consultant to confirm the neutralisation process and chemical concentrations in order for the material to be considered suitable for re-use on-site.

8 Conceptual Site Model

8.1 Conceptual Site Model

Generally, a conceptual site model (CSM) provides an assessment of the fate and transport of COPCs relative to site specific, subsurface conditions with regard to their potential risk to human health and the environment. The CSM takes into account site specific factors including:

- Source(s) of contamination
- Identification of COPCs associated with past (and present) source(s)
- Vertical, lateral and temporal distribution of COPCs
- Site specific lithological information including soil type(s), depth to groundwater, effective porosity, and groundwater flow velocity and
- Actual or potential receptors considering both current and future land use both for the site and adjacent properties, and any sensitive ecological receptors.

Based on the information sourced in this report, a CSM has been developed and is outlined in **Table 8-1**, below. Additional details are included in the sections that follow as necessary.

Table 8-1 Conceptual Site Model (CSM)

Conceptual Site Model Element	Description
Contamination Sources	Based on the results of investigation undertaken, the sources of subsurface contamination include: ▪ Contamination as a consequence of uncontrolled fill material ▪ Contamination as a consequence of demolition of buildings containing hazardous building materials and soil impacts as a consequence of residual demolition waste ▪ Presence of soil contamination as a consequence of historical spills and leaks
Site Current and Future Use	Current site use is as an infant's school. Future site is as a primary school.
Site Geology	Medium to fine grain marine sand with podsols.
Site Hydrogeology	The Botany Sand Aquifer is present beneath the site. The SWL of groundwater at the Site measured from installed bores is 3.8 to 3.9 mBGL.
COPCs - Soil	The following COPCs have been identified above adopted Tier I screening criteria at the Site: ▪ Concentrations of asbestos have been detected within soils above the adopted NEPM HSL, and fragments have been identified at the soil surface; ▪ Concentrations of nickel have been detected above the adopted Site Specific EIL; ▪ Concentrations of hydrocarbons (TRH C_{16}-C_{34}) have been identified above the adopted NEPM ESL.
Extent of Impacts - Soil	Concentrations of TRH C_{16}-C_{34} were detected above the adopted ESL in shallow soils at BH04. The vertical extent of impact is considered to be the depth of fill material, being 0.5 mBGL. The lateral extent has conservatively been estimated as the distance to the nearest clean location, with an indicative area of 1,500 m^2. Concentrations of nickel were detected in surface soils above the adopted EIL in shallow surface soils. The vertical extent of impact is considered to be the depth of fill, being 0.3 to 0.4 mBGL. The lateral extent has conservatively been estimated as the distance to the nearest clean location, with an indicative area of 1,300 m^2. Concentrations of asbestos in soil exceeding the adopted HSL were detected at TP04 within shallow fill, and at the soil surface at TP03 and south east of BH02. The vertical extent of impact is considered to be the depth of fill, which varies between 0.3 mBGL at BH01 and 1.2 mBGL at TP03. The lateral extent

	of impact has been conservatively estimated as the distance to the nearest clean location, with an indicative area of 2,200 m^2.
COPCs – Groundwater	Copper was detected slightly above the NEPM GILs for marine waters in MW02 (0.002 mg/L).
Extent of Impacts - Groundwater	Given concentrations of copper within Site soils were within acceptable criteria, and the urbanized nature of the site and surrounds, the concentrations are likely to be a function of regional groundwater quality rather than a result of site contamination. Given the distance to the nearest receiving body, and the low levels detected, the potential risks from groundwater at the Site are considered low and acceptable.
Potential Human Receptors	Current and future users of the site, including students, staff, construction and maintenance workers.
Potential Environmental Receptors	On-site vegetation communities, and off-site receptors including aquatic communities in the Cooks River and Botany Bay.

8.2 Conceptual Site Model Summary and Risk Assessment

The following sections summarise the Conceptual Site Model and an evaluation of potential risks to human and environmental receptors. Consideration should be given to any data gaps or uncertainties described in **Section 8.3** below.

8.2.1 Asbestos in Soils

ACM in the form of fibre cement debris was identified at the soil surface in two locations, beneath turf at TP03, and within shallow fill material at TP04. The potential area of impact is located in the eastern section of the Site, adjacent to the pre-school boundary fence. The fill material encountered within the area consists of sand and silty sand, with variable depths of between 0.3 and 1.2 mBGL.

Concentrations of asbestos in soil exceeded the adopted human health screening criteria, indicating a potential human health risk via inhalation pathways and will require some level of remediation, management or risk assessment in order to render the site suitable for the proposed land use.

Under the current site use, potential receptors include students, staff and maintenance workers. Given that the material encountered consisted of fibre cement debris, and that no further surface debris was observed other than material sampled, the current risk to receptors is considered to be low. In addition, control air monitoring undertaken during disturbance of the area indicated airborne concentrations were below the exposure standard.

During the proposed development, disturbance of the soils poses a potential low inhalation risk to construction and maintenance workers, site users, and off-site receptors. An Asbestos Management Plan (AMP) should be developed to manage potential risks during construction.

Under the proposed site use, the soils will require remediation, management or risk assessment in order to render the site suitable. Options for remediation or management include consolidation of the material on-site beneath a suitable capping layer or hardstand, or removal from site and disposal at a suitably licenced landfill. If retention of the material on site is preferred, a Long Term Environmental Management Plan (LTEMP) may be required. Given that the area of impact is generally located within the footprint of the proposed future school building, it is likely that some excavation and disposal of soils will be required.

It is Cardno's opinion that the identified impacts can be managed and remedied during development in order to render the site suitable.

8.2.2 Nickel and TRH C_{16}-C_{34}

Concentrations of nickel were detected above the Tier I Site Specific EIL in shallow soils at two locations (TP06_0.1 and TP13_0.1), in addition, hydrocarbon fractions C_{16}-C_{34} were detected at concentrations above the adopted ESL in BH04_0.4 for continued use as a primary school. Potential ecological receptors include on-site vegetation, and off-site receptors such as the Cooks River and Botany Bay.

The risk to groundwater and off-site receptors is considered low and acceptable due to the relatively immobile nature of the contaminants identified, and that concentrations within groundwater sampled at the Site were below the adopted screening criteria.

During development the area characterised by TP06 and TP13 is proposed to be beneath the school building, expanded carpark, or landscaped. The landscaping of the area is indicated to involve removal of surface soils and import of topsoil. The proposed works are likely to remove the nickel containing soils, or mitigate their contact with on-site vegetation. As such, the potential risk posed by the soils to sensitive receptors is considered low.

During development, the area characterised by BH04 is intended to remain as a hardstand area, with installation of subsurface water tanks and concrete slabs. The presence of hardstand is considered to effectively mitigate any potential exposure of ecological receptors to the soils containing TRH above the adopted screening criteria. As such, the potential risk posed by the soils is considered low.

If the proposed development plans change and the areas above are intended to be vegetated, consideration should be given to; placing the soils beneath hardstand, at a depth of 2 mBGL or greater, or removal from site.

It is Cardno's opinion that under the proposed development the identified impacts do not pose an unacceptable risk to environmental receptors, and any receptor pathways are likely to be mitigated during the planned redevelopment.

8.2.3 Potential Acid Sulfate Soils

Potential Acid Sulfate Soils (PASS) have been identified at depths of 7 mBGL and greater, associated with natural sands and clays. If these soils are to be disturbed and allowed to oxidise, the potential acid generation poses an environmental risk to ecological receptors such as on-site vegetation and off-site receptors via groundwater. The acid generated also has the potential to degrade structures installed. An Acid Sulfate Soils Management Plan (ASSMP) should be developed to manage the disturbance of these soils by activities such as excavation and piling, or by lowering of the water table.

8.3 Data Gaps and Uncertainties

The results of the soil sampling program conducted at the Site showed that that measurable COPCs are generally absent from the shallow soils except for the areas identified above. Should previously unidentified areas of soil impacts be discovered during future phases of work at the Site, or sensitive receptors identified, additional investigation may be required.

Given the presence of fill on the site, there is likely to be some variability in the quality and type of the fill. Due to the discrete nature of ACM in soil, there is potential for ACM to be present in other areas. An Unexpected Finds Protocol should be employed to manage any previously unidentified areas of potential contamination.

Due to the Site being a functioning school, investigation was not able to undertaken within the building footprint of structures. As such there is some uncertainty as to subsurface conditions beneath buildings. During further phases of work if these soils are to be disturbed, a data gap investigation should be undertaken to ensure any potential risks are characterised.

These data gaps are not considered significant when making overall conclusions about the potential risks at the Site and can be remedied / managed under future phases of the proposed development.

9 Conclusions and Recommendations

9.1 Conclusions

Cardno has completed a Detailed Site Investigation (DSI) and Acid Sulfate Soils Investigation for Kyeemagh Infants School, corner of Jacobson Avenue and Beehag Street, Kyeemagh NSW. The purpose of the DSI was to assess soil and groundwater at the Site with regards to potential contamination and ASS in accordance with Item 12 of the Secretaries Environmental Assessment Requirements for Application Number SSD 9391.

The objective of the DSI was to investigate the potential for soil and groundwater contamination at the site which may pose a risk to human health or the environment under the proposed redevelopment as a primary school.

9.1.1 Summary of Contamination Potential

Based on the site history and results of the intrusive investigation, the potential sources of impacts at the Site included:

> Contamination as a consequence of uncontrolled fill material;

> Contamination as a consequence of demolition of buildings containing hazardous building materials and soil impacts as a consequence of residual demolition waste

> Presence of soil contamination as a consequence of historical spills and leaks

9.1.2 Summary of Results, CSM and Risk Assessment

9.1.2.1 Groundwater

Cardno installed and sampled three monitoring wells across the Site as part of the intrusive investigation. Concentrations of COPCs within groundwater were generally below the adopted assessment criteria with the exception of copper within MW02. Given that concentrations of copper within site soils were within acceptable criteria, and the urbanized nature of the site and surrounds, the concentrations are likely to be a function of regional groundwater quality rather than a site specific source. The potential risks from groundwater at the Site are considered low and acceptable.

9.1.2.2 Asbestos in Soils

ACM in the form of fibre cement debris was identified at the soil surface in two locations, beneath turf at TP03, and within shallow fill material at TP04, exceeding the adopted HSLs for continued use as a primary school. The potential area of impact is located in the eastern section of the Site, adjacent to the pre-school boundary fence. The fill material encountered within the area consists of sand and silty sand, with variable depths of between 0.3 and 1.2 mBGL.

Under the current site use, the risk posed to receptors by the soils is considered low. This is due to:

> The material encountered being bonded fibre cement material in fair condition;

> That no further material was encountered at the soil surface; and

> That control air monitoring during disturbance of the soils indicate airborne concentrations were below the exposure standard.

During the proposed development, disturbance of the soils poses a potential low inhalation risk to construction and maintenance workers, site users, and off-site receptors. An Asbestos Management Plan should be developed to manage potential risks during construction.

Under the proposed site use, the soils will require remediation, management or risk assessment in order to render the site suitable. Options for remediation or management include consolidation of the material on-site beneath a suitable capping layer or hardstand, or removal from site and disposal at a suitably licenced landfill. If retention of the material on site is preferred, a Long Term Environmental Management Plan (LTEMP) may be required.

It is Cardno's opinion that the identified impacts can be managed and remedied during development in order to render the site suitable.

9.1.2.3 Nickel and TRH C_{16}-C_{34}

Concentrations of nickel were detected above the Tier I Site Specific EIL in shallow soils at two locations (TP06_0.1 and TP13_0.1), in addition, hydrocarbon fractions C_{16}-C_{34} were detected at concentrations above the adopted ESL in BH04_0.4 for continued use as a primary school.

During development the area characterised by TP06 and TP13 is proposed to be beneath the school building, expanded carpark, or landscaped. The landscaping of the area is indicated to involve removal of surface soils and import of topsoil. The proposed works are likely to remove the nickel containing soils, or mitigate their contact with on-site vegetation. As such, the potential risk posed by the soils to sensitive receptors is considered low.

During development, the area characterised by BH04 is intended to remain as a hardstand area, with installation of subsurface water tanks and concrete slabs. The presence of hardstand is considered to effectively mitigate any potential exposure of ecological receptors to the soils containing TRH above the adopted screening criteria. As such, the potential risk posed by the soils is considered low.

It is Cardno's opinion that under the proposed development the identified impacts do not pose an unacceptable risk to environmental receptors, and any receptor pathways are likely to be mitigated during the planned redevelopment.

9.1.3 Potential Acid Sulfate Soils

Potential Acid Sulfate Soils (PASS) have been identified at depths of 7 mBGL and greater, associated with natural sands and clays. If these soils are to be disturbed and allowed to oxidise, the potential acid generation poses an environmental risk to ecological receptors such as on-site vegetation and off-site receptors via groundwater. The acid generated also has the potential to degrade structures installed. An Acid Sulfate Soils Management Plan (ASSMP) should be developed to manage the disturbance of these soils by activities such as excavation and piling, or by lowering of the water table.

9.2 Recommendations

To manage the potential risks at the Site and validate the suitability of the Site for the continued land use, some remediation, management or risk assessment of the site will be required. Based on the information above, Cardno provides the following recommendations:

- Develop a Remediation Action Plan (RAP) to evaluate the potential management, remediation and / or risk assessment options, detail additional soil sampling rates for data gap investigation, waste classification / re-use requirements and validation criteria to guide and inform the development works. Potential applicable remedial strategies that should be considered include but are not limited to:
  - Site specific human health and ecological risk assessment;
  - Excavation and off-site disposal of impacted soil;
  - Capping with material suitable for the development and future areas of vegetation (potentially 500 mm of clean soil or a suitable depth of hardstand);
- The RAP should also include:
  - An Unexpected Finds Protocol to manage any risks of unidentified impacts such as hazardous materials or waste in fill material;
  - Sampling requirements to classify soil if off-site disposal of soils is required. A suitably qualified Environmental Consultant should be engaged a to undertake sampling at densities in accordance with the NSW EPA *Sampling Design Guidelines* (1995) and/or the NSW EPA *Excavated Natural Material Order* (2014) in order to issue a Waste Classification for the material;
  - If re-use of excavated soils on-site is proposed, validation sampling at a rate consistent with NEPM and / or ENM Order guidance should be undertaken to ensure the soils are suitable for the proposed land-use. The sampling density would be included in the RAP.
- If not incorporated into the RAP, additional management plans should be developed including:
  - An Acid Sulfate Soils Management Plan (ASSMP) detailing the procedure for disturbance of PASS material, and the process for treatment and validation of neutralisation;
  - An Asbestos Management Plan (AMP) detailing the procedure for disturbance of ACM containing soils including control measures and WHS requirements.

10 References

ASSMAC (1998) *Acid Sulfate Soils Assessment Guidelines*, Acid Sulfate Soils Management Advisory Committee, August 1998;

Cardno (2018) *Kyeemagh Public School – Flooding Advice*, letter dated 31 October 2018.

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CRC Care (2011*) Technical Report No. 10 Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater Part 1: Technical Development Document*, September 2011;

Hamilton-Irvine, Gary. “Kyeemagh Infants School Turns 75”. *St George and Sutherland Shire Leader* 14 August. 2017. Web. 21 Jan 2019.

HEPA (2018) *PFAS National Environmental Management Plan*, January 2018;

NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Measure (NEPM)*. National Environment Protection Council (NEPC) 1999, Amendment 2013;

NEPC (2013) *Schedule B(2) Guideline on Site Characterisation*, NEPM 1999, Amendment 2013;

NSW Department of Urban Affairs and Planning (1998) *Managing Land Contamination: Planning Guidelines: SEPP 55 Remediation of Land*, 1998;

NSW EPA (1995) *Contaminated Sites Sampling Design Guidelines*. New South Wales Environment Protection Authority (EPA), September 1995;

NSW OEH (2011) *Guidelines for Consultants Reporting on Contaminated Sites*. New South Wales Office of Environment a& Heritage (OEH), November 1997, Reprinted September 2000, Reprinted August 2011;

Parsons Brinckerhoff (PB, 2014a) *Asbestos Remediation Clearance Certificate*. Prepared 9 July 2014.

Parsons Brinckerhoff (PB, 2014b) Asbestos in Grounds, Asbestos Management Plan, Kyeemagh Infants School, Kyeemagh, NSW. Prepared July 2014.

Standards Australia (2005) *Australian Standard AS 4482.1-2005 – Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compound*s. Standards Australia, Homebush, NSW; and

Standards Australia (1999) *Australian Standard AS 4482.2-1999 - Guide to the sampling and investigation of potentially contaminated soil. Part 2: Volatile substances*. Standards Australia, Homebush, NSW.

11 Limitations

This assessment has been undertaken in general accordance with the current "industry standards" for a DSI for the purpose and objectives and scope identified in this report. These standards are set out in:

- National Environment Protection [Assessment of Site Contamination] Measure (NEPM), December 1999, National Environment Protection Council (NEPC).
- National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999 (NEPC, 1999) as varied May 2013 (the 'NEPM').
- AS4482.1- 2005: Guide to the sampling and investigation of potentially contaminated soil Part 1: Nonvolatile and semi-volatile compounds. Standards Australia (2005).

The agreed scope of this assessment has been limited for the current purposes of the Client. The assessment may not identify contamination occurring in all areas of the site, or occurring after sampling was conducted. Subsurface conditions may vary considerably away from the sample locations where information has been obtained.

This Document has been provided by Cardno subject to the following limitations:

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- Conditions may exist which were undetectable given the limited nature of the enquiry Cardno was retained to undertake with respect to the site. Variations in conditions may occur between investigatory locations, and there may be special conditions pertaining to the site which have not been revealed by the investigation and which have not therefore been taken into account in the Document. Accordingly, additional studies and actions may be required.
- In addition, it is recognised that the passage of time affects the information and assessment provided in this Document. Cardno's opinions are based upon information that existed at the time of the production of the Document. It is understood that the services provided allowed Cardno to form no more than an opinion of the actual conditions of the site at the time this Document was prepared and cannot be used to assess the effect of any subsequent changes in the quality of the site, or its surroundings, or any laws or regulations.
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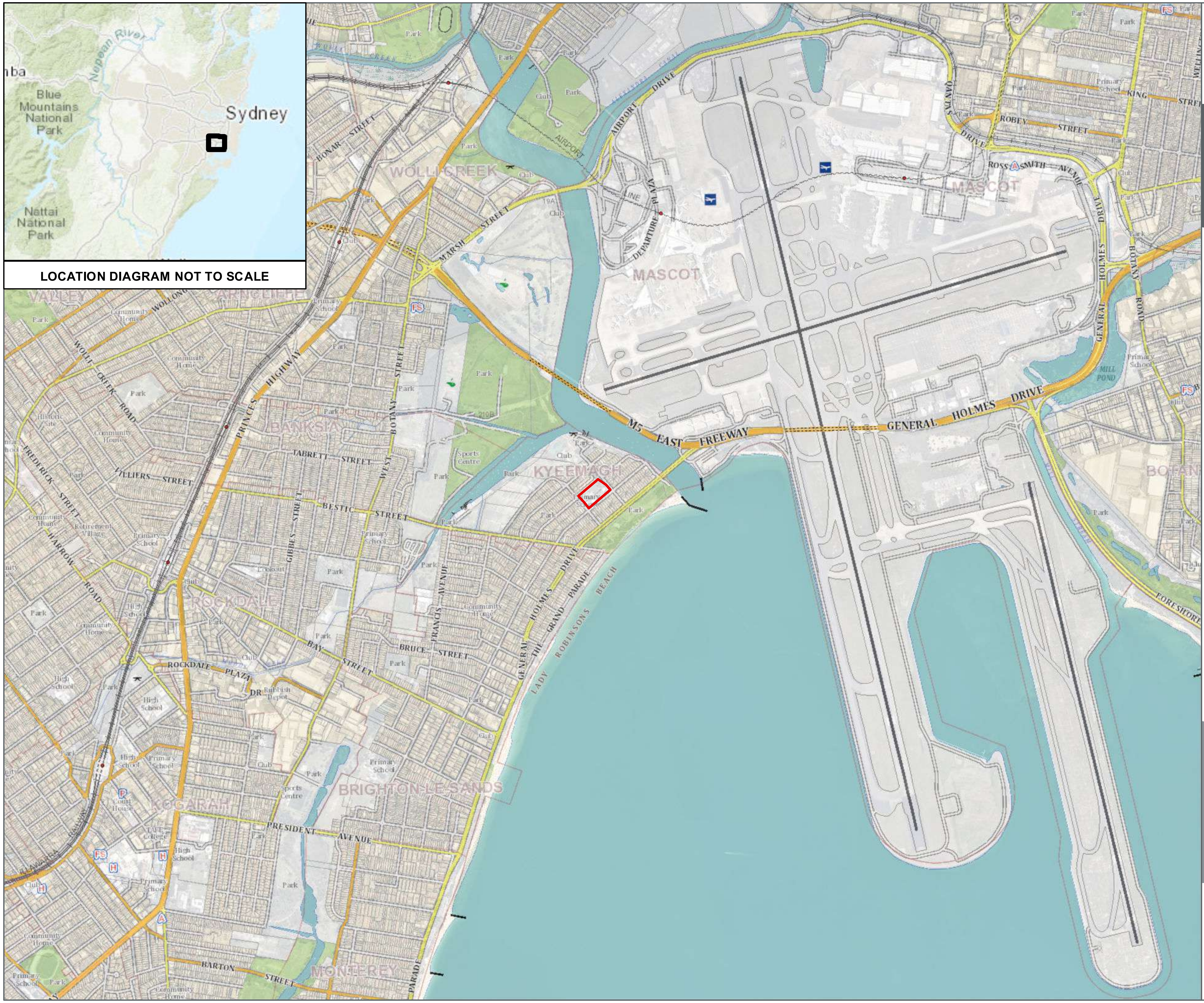
This assessment report is not any of the following:

- A Site Audit Report or Site Audit Statement as defined under the Contaminated Land Management Act, 1997.
- A geotechnical report and the bore logs or test pit logs may not be sufficient as the basis for geotechnical advice.
- A detailed hydrogeological assessment in conformance with NSW DEC (2007) Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination.

APPENDIX

A

FIGURES



Kyeemagh Infants School

Detailed Site Investigation

REGION & VICINITY

Legend

🟥 Site Boundary

FIGURE 1

1:20,000 Scale at A3

m
0 200 400 600 800

Map Produced by NSW/ACT (WNE)
Date: 2018-12-11 | Project: 80818157
Coordinate System: GDA 1994 MGA Zone 56
Map: 80818157-GS-001-Location.mxd 01
Imagery supplied by nearmap 2018

Kyeemagh Infants School

Detailed Site Investigation

SITE PLAN &
INTRUSIVE LOCATIONS

Legend

🟥 Site Boundary

⊕ Borehole / Test Pit Locations

🟨 Excluded Area

FIGURE 2

1:800 Scale at A3

Cardno

Map Produced by NSW/ACT (WNE)
Date: 2018-12-11 | Project: 80818157
Coordinate System: GDA 1994 MGA Zone 56
Map: 80818157-GS-002-SitePlan.mxd 01
Imagery supplied by nearmap October, 2018

Kyeemagh Infants School

Detailed Site Investigation

AREAS OF CONCERN

Legend

🟥 Site Boundary

⊕ Borehole / Test Pit Locations

▭ Excluded Area

Areas of Concern (Indicative only)

🟩 EIL / ESL Exceedance

🟧 ACM In / On Soil

FIGURE 3

1:800 Scale at A3

m
0 5 10 15 20

Cardno

Map Produced by NSW/ACT (WNE)
Date: 2018-12-11 | Project: 80818157
Coordinate System: GDA 1994 MGA Zone 56
Map: 80818157-GS-003-ConcernAreas.mxd 01
Imagery supplied by nearmap October, 2018

1 CS002_GROUND FLOOR
A401 1 : 200

Notes

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- 🟦 HOME BASE
- 🟩 PRACTICAL LEARNING SPACES
- 🟧 ADMINISTRATION
- 🟫 GROUP WORK
- ⬜ HARD PAVING
- 🟪 HALL

SCHEMATIC DESIGN

NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
Q	SSD ISSUE	22.01.19	RS	BZ
P	CONCEPT DESIGN REPORT	24.08.18	DD	RS
N	CONSULTANTS REVIEW	13.08.18	DD	RS
M	PRG REVIEW	10.08.18	DD	RS
L	UPDATED LAYOUTS	02.07.18	DD	RS
K	PRG MEETING	04.07.18	DD	RS
J	CONCEPT DESIGN	29.06.18	DD	RS
H	CONSULTANTS REVIEW	25.06.18	DD	RS
G	PRG REVIEW	21.06.18	DD	RS
F	CONSULTANTS REVIEW	18.06.18	DD	RS
E	PRG MEETING	06.06.18	DD	RS
D	CONSULTANTS REVIEW	29.05.18	DD	RS
C	LAYOUT TO INCLUDE OHSC	21.05.18	DD	RS
B	EFSG PRESENTATION	26.04.18	DD	RS
A	EFSG PRELIMINARY REVIEW	19.04.18	DD	RS

Architect/ Designer
dwp
www.dwp.com

Client
NSW Dept of Education & School Infrastucture NSW

Project
KYEEMAGH PUBLIC SCHOOL

Location
JACOBSON AVE, KYEEMAGH NSW 2216

Project Number
AUSYD-17-0774

Drawing
GROUND FLOOR

Scale (A1)
As indicated

Date Printed
22-Jan-19 6:22:32 PM

Drawing Number
CS002

Issue
Q

dwp

File Name: BIM 360://dwp_17-0774 KYEEMAGH PUBLIC SCHOOL/AUSYD-17-0774_Kyeemagh Public School.rvt

APPENDIX

B

SITE PHOTOGRAPHS

Photograph 1: Site view, facing west from Jacobson avenue boundary, showing grassed open playing area and school infrastructure.

Photograph 2: Site view of school infrastructure, hardstand and BH04 location, facing east.

Photograph 3: Site view towards BH02 location showing the north site boundary abutting residential properties, the pre-school area, and access gate to Tancred Avenue.

Photograph 4: Clad buildings adjacent to Jacobson Avenue with potential ACM wall linings.

Photograph 5: TP12 location showing shallow fill and topsoil profile over sands within the open grassed area.

Photograph 6: TP10 location showing shallow topsoil profile over sands adjacent Jacobson Avenue.

Photograph 7: ABS2 location adjacent TP19 showing representative fibre cement fragments containing chrysotile asbestos at the soil surface.

APPENDIX

C

SUPPORTING DOCUMENTS

Asbestos in Grounds, Asbestos Management Plan, Kyeemagh Infants School, Kyeemagh, NSW

DRAFT

July 2014

NSW Public Works

PARSONS BRINCKERHOFF

Parsons Brinckerhoff Australia Pty Limited
ABN 80 078 004 798

Level 27, Ernst & Young Centre
680 George Street
Sydney NSW 2000
GPO Box 5394
Sydney NSW 2001
Australia
Telephone *+61 2 9272 5100*
Facsimile *+61 2 9272 5101*
Email *sydney@pb.com.au*

Certified to ISO 9001, ISO 14001, AS/NZS 4801
A GRI Rating: Sustainability Report 2011

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Author: .... Lamice Ali

Signed: ....

Reviewer: .... Warren Lal

Signed: ....

Approved by: .... Jason North

Signed: ....

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Appendices

DRAFT

1. Introduction

1.1 Document Review

No Activity and/or no Re-occurrence of ACM in grounds on this site since July 2014, as such the following is recommended:

This document is to be reviewed and updated

- when works occur on site
- when works occur on site which may cause grounds disturbance
- when any ACM in grounds is reported
- every second year, if no activity.
- until ten years of inactivity, when document review and update will occur every five years

1.2 Background

In July 2014, asbestos cement fragments were identified in the eastern section of the grassy field to the day care building, at Kyeemagh Infants School, located on the corner of Jacobson Avenue & Beehag St, Kyeemagh NSW 2216.

In order to manage the risk of exposure to asbestos, any fibrous cement fragments are to be removed from the ground surfaces (Refer to Section 1.3). The areas where fibrous cement fragments have been identified within the fill material (and further in-situ asbestos fragments may be present) have been designated as “asbestos zones”.

This report outlines the plan for management of the identified asbestos impacted areas (zones), and should be read in conjunction with the existing Department of Education and Communities (DEC) Asbestos Management Plan for all other identified asbestos materials within the school.

1.3 Asbestos removal/clean-up works

The asbestos removal/ clean up works completed in 2014 comprised:

- the removal, clean-up and disposal of the visible fragments of fibrous cement on the ground surface. Removal was limited to the accessible surface areas only.

The remediated areas are shown in Figure 1.

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2. Asbestos materials

2.1 Asbestos zone locations

Asbestos cement fragments may be present as a component of buried fill within the asbestos zone areas. Refer to Figure 1 site plan.

Based on guidelines provided by WorkCover NSW 'Managing Asbestos in and on Soil 2014', as well as DEC's 'Asbestos Management Plan for Schools and Colleges 2014', a licenced asbestos assessor should be engaged to determine whether the asbestos within the Asbestos Zones is considered non-friable or friable.

2.2 Risk management

The in-situ asbestos within the asbestos zones can be classified as low risk provided that the following measures are undertaken:

- The control measures installed are fully maintained.
- The in-situ asbestos remains undisturbed.
- An asbestos management plan remains in effect.
- Any works undertaken on or near the asbestos zones are to be under the control of a permit to work where the contractor has acknowledged the presence of asbestos and has prepared a safe work method statement(s) to ensure that asbestos is not disturbed and therefore airborne asbestos fibres are not generated.

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3. Asbestos register (Grounds)

Table 3-1 outlines the findings of the inspection of the grounds indicating the areas requiring management.

Table 3-1 Asbestos Register – Asbestos zones only for Kyeemagh Infants School

Event	Location	Description of Material	Extent	Condition	Risk Status	Control Priority	Control Recommendation/Comments
School Grounds*							
A	Grassy field to day care building, extending from school boundary fence to Jacobson Ave, to large tree to building G.	Possible buried asbestos cement fragments	Throughout – below ground surface	Unknown	Low	Low	The area should be regularly monitored for any fragments and a record kept of how many are found and at what frequency. Fragments should be collected and disposed of as asbestos waste. Consideration should be given to the repair of surface coverage using turf, fake turf, hardstand, or a thick mulch layer as appropriate cover which will prevent heavy foot traffic damage and reduce erosion caused by water runoff.

*Refer to Figure 1 for detail of area locations

DRAFT

Risk assessment factors

Low risk: Asbestos materials that pose a low health risk to personnel, employees and the general public provided they remain undisturbed.

Medium risk: Asbestos materials that pose a moderate risk to people in the area – there is a medium potential for the material to release asbestos fibres, if disturbed.

High risk: Asbestos materials that pose a high health risk to personnel or the public in the area of the material – there is a high potential for the material to release asbestos fibres, if disturbed.

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4. Asbestos zone routine management

4.1 Inspections by local staff

In order to monitor the effectiveness of the on-site asbestos zone management, it is essential that the affected areas are regularly inspected. Visual inspections of the asbestos remedial measures should be carried out to ensure that they are maintained adequately. Such inspections should occur on the following occasions:

- at three monthly intervals (e.g. a walkover of remediated areas to ensure that applications of mulch and turf, etc. have been maintained)
- after a period of prolonged heavy rain (e.g. a walkover of remediated areas to ensure that applications of mulch and turf, etc. have not been disturbed by heavy rain)
- whenever damage or disturbance has been reported (e.g. a walkover of remediated areas to ensure that applications of mulch and turf, etc. have not been disturbed by events such as vehicle movements).
- whenever works are about to commence that may cause grounds disturbance

Should areas be identified where encapsulating measures appear to be damaged or are no longer effective, these areas should be re-covered immediately. Some remedial measures such as the installation of layers of mulch and top soil will require ongoing maintenance to ensure that a sufficient barrier layer is in place.

4.2 Maintenance

All remediation measures carried out in the affected areas must be maintained as per their original application. In particular:

- All surface cover/treatments within the asbestos zones must be fully maintained at all times. For example, mulch levels should remain as per their original application, turf should be maintained to ensure full coverage and any other measures should be maintained in a good condition.
- All hard standing surfaces must be maintained and re-instated should any works that disturb them be carried out.
- If any portion of an affected area is found to be damaged (i.e. the surface cover has been damaged so that it has resulted or may result in the soil becoming exposed), the DEC local Asset Management Unit (AMU) should be contacted immediately.

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4.3 Checklist

A checklist of site management requirements is presented in Appendix A of this document. This checklist should be used whenever walkover inspections are carried out and where maintenance issues have been raised. The checklist is specific to the requirements of the grounds at the Kyeemagh Infants School and sets out the frequency of inspections required. It is recommended that a hard copy of the check-list retained by the school and field copies are taken on-site when required.

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5. Asbestos zone maintenance works management

5.1 General

An Asbestos Management Plan (AMP) has been implemented for all NSW state schools and educational facilities. The plan includes procedures for managing friable asbestos and working on asbestos. A generic permit to work template will also be included in the management plan which will be able to be used where any work is required that may disturb asbestos materials within an asbestos zone.

5.2 Sub-soil areas within school grounds

- Any contractor, maintenance person; all Department of Commerce, Department of Education & Communities personnel or other authorised persons must acknowledge the presence of buried asbestos cement materials within these areas. A copy of the asbestos register must be made available to any such person prior to commencing work.

- Any contractor, maintenance person; all Department of Commerce, Department of Education & Communities or other authorised person who may potentially disturb the soil surface must complete a permit to work or similar form that ensures that any work will not disturb the buried asbestos.

- If work is to be carried out in grounds that will disturb or potentially disturb the buried asbestos, the contractor, maintenance person; all Department of Commerce, Department of Education & Communities personnel or other authorised person must engage a licensed asbestos removal contractor with a friable asbestos licence to undertake the work. The licensed contractor should prepare a safe work method statement detailing procedures that ensure that personnel working in the asbestos zones and any other persons within the school will not be exposed to asbestos fibres. The work area must be completely enclosed and work undertaken out of school hours.

- Work in progress asbestos air monitoring should be carried out during any work that disturbs or could potentially disturb the buried asbestos and/or the soil surface. Air-monitoring should be in accordance with the National Occupational Health & Safety Commission's Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition [NOHSC: 3003 (2005)] and be conducted by National Association of testing Authorities (NATA) accredited personnel operating from a NATA registered laboratory.

- All asbestos management measures originally installed must be re-instated at the completion of work and prior to the removal of the work area enclosure.

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6. Permit for work

Any contractor who proposes to work in any of the asbestos zones where asbestos may be disturbed or the ground surface may be broken must complete a permit to work form.

Before a permit to work is issued, individuals will be required to read and understand the AMP, as well as copies of the relevant asbestos registers. Individuals must be aware of their legal obligations in relation to health and safety as specified in the Work Health and Safety Act 2011 and the Work Health and Safety Regulation 2011.

Permits to work are designed to ensure appropriate work practices are employed in the vicinity of asbestos-containing materials/products. The permit to work will document what asbestos is to be removed, encapsulated or otherwise protected, prior to the contracted maintenance or building works proceeding. The permit to work will also indicate whether other requirements, such as the use of personal protective equipment (PPE), the installation of barricading and/or airborne fibre monitoring, are necessary.

When the work is completed, or the permit to work expires (whichever occurs first), the permit shall be signed and returned to the DEC Facility Manager for cancellation after that Manager has checked a safe situation exists.

The DEC local AMU shall be advised immediately of any incidents of non-compliance with the AMP.

Based on guidelines provided by WorkCover NSW ‘Managing Asbestos in and on Soil 2014’, as well as DEC’s ‘Asbestos Management Plan for Schools and Colleges 2014’, a licenced asbestos assessor should be engaged to determine whether the buried asbestos is considered *non-friable* or *friable*. Therefore, any fibrous cement materials or other suspected asbestos-containing materials excavated should be inspected by a licenced asbestos assessor to determine if it’s friable. This means that any such asbestos should be worked on only by contractors with an appropriate asbestos licence and a project specific permit issued by WorkCover NSW (in addition to the permit to work, mentioned above).

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7. Legislative requirements

The following legislative requirements will apply to asbestos zone maintenance works:

- All asbestos removal and disposal work shall be carried out in accordance with the requirements of the WorkCover NSW Guidelines for Licensed Asbestos Removal Contractors
- The asbestos contractor shall notify WorkCover NSW of the proposed work at least 5 days prior to the commencement of any work in accordance with NSW Occupational Health and Safety Regulation 2011. However this time period may be waived in the case for DEC properties
- All work shall be carried out in strict accordance with the NSW Work Health and Safety Act 2011, the NSW Work Health and Safety Regulation 2011, How to Safely Remove Asbestos – Code of Practice 2011, and the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres, 2nd Edition [NOHSC 3003 (2005)].

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8. Safe work procedures for asbestos work

The following safe work procedures will apply for asbestos work:

- The removal contractor must develop a site-specific asbestos removal plan before commencing the asbestos work. Such a plan must be prepared in accordance with Section 3 of the Work Safe Australia- How to safely remove asbestos: Code of Practice 2011.

- Only personnel who have been trained in work procedures for the safe removal of asbestos shall work on asbestos.

- A trained, experienced operator must remain on duty outside the removal area and/or enclosure (if installed) at all times that asbestos removal is in progress. Curricula vitae for all persons undertaking asbestos removal works must be submitted to the Principal prior to the commencement of work on the sites.

- Removal of asbestos must generally be carried out by wet removal techniques. That is, as the asbestos material becomes accessible during the removal process, it shall be thoroughly wetted down. Care must be exercised to prevent excessive use of water. The contractor will be held responsible for any water damage.

- Decontamination facilities and procedures shall be undertaken to the complete satisfaction of a hygienist.

- Any signage existing prior to removal must be re-affixed to any new or existing assembly.

- The contractor must ensure that persons in the work area(s) are not exposed to fibre levels greater than those stated in the National Exposure Standard for the type of asbestos being removed.

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Figures

Site layout plans

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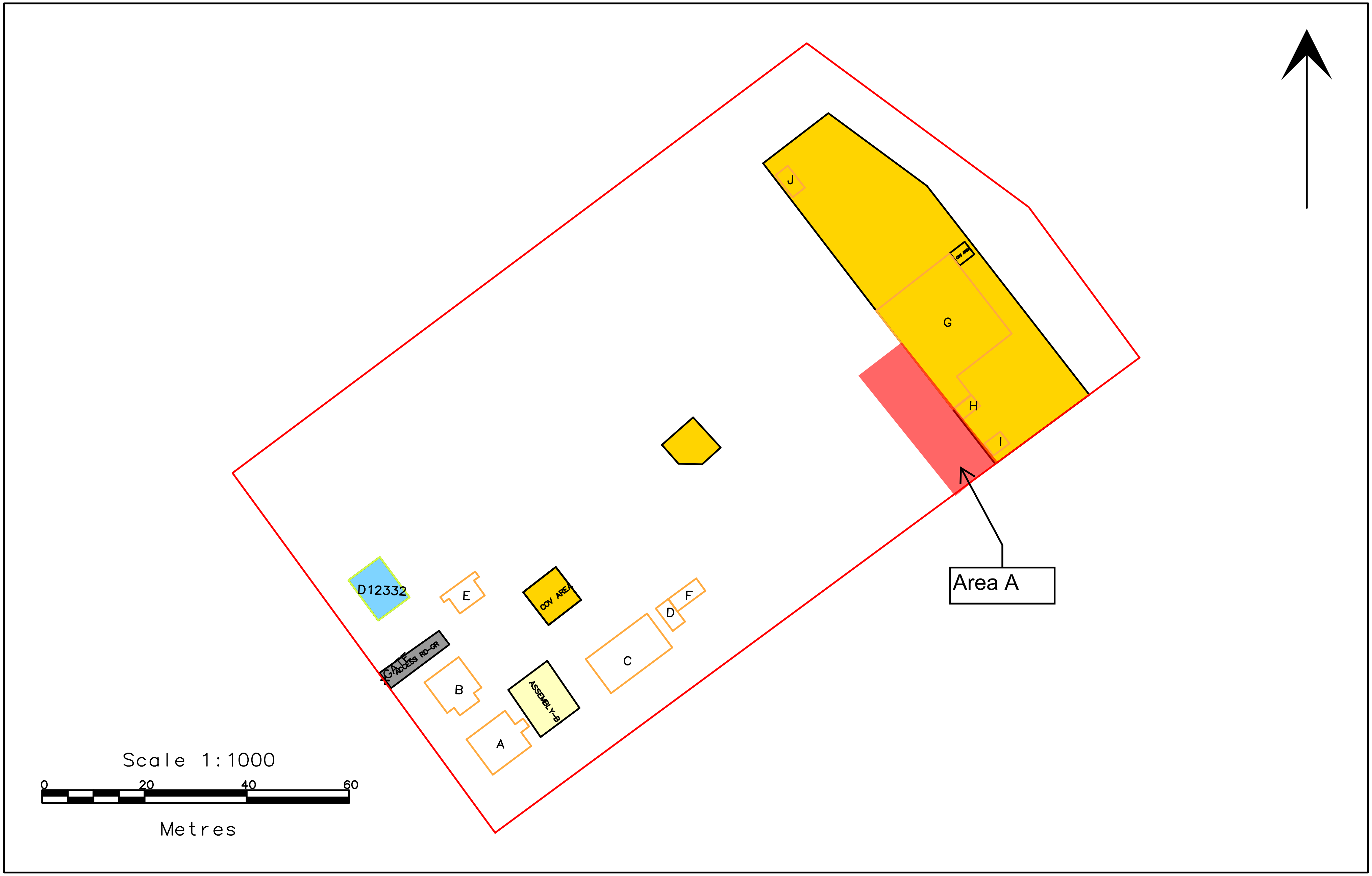
5141 — Kyeemagh Infants School

Site Plan (11730)



Appendix A

Grounds management checklist

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Kyeemagh Infants School grounds asbestos management checklist – Routine three monthly inspections

Table 1 Routine monthly inspection checklist

		Three monthly inspections	Initial inspection	Subsequent three-monthly inspections			
Area	**Location description**		Date:	Date:	Date:	Date:	Date:
A	Grassy field to day care building, extending from school boundary fence to Jacobson Ave, to large tree to building G	Surface cover adequate (Y/N)					
		Suspected asbestos materials visible (Y/N)					

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Kyeemagh Infants School grounds asbestos management checklist – Incident inspections (e.g. after heavy rain or disturbance)

Table 2 Incident inspection checklist

		Three monthly inspections	**Initial inspection**	**Subsequent three-monthly inspections**			
Area	**Location description**		Date:	Date:	Date:	Date:	Date:
A	Grassy field to day care building, extending from school boundary fence to Jacobson Ave, to large tree to building G	Surface cover adequate (Y/N)					
		Suspected asbestos materials visible (Y/N)					

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PARSONS
BRINCKERHOFF

Asbestos Remediation Clearance Certificate

Compliant with Part 3.10 of Safe Work Australia Code of Practice: How to Safely Remove Asbestos, Code of Practice 2011

Project Information

Client: The Trades Team

Contact: Michael Soliman
Unit 29/105A Vanessa Street
Kingsgrove NSW 2208

Project number: 2259070A

Site Details

Site: 5141 – Kyeemagh Infants School – Corner Jacobson Ave and Beehag St, Kyeemagh NSW 2216

Specific work area(s)/room(s): Grassy area, at the corner of the school play field and the day care building, to Jacobson Ave.

Description of ACM removal works

Removal contractor: Australasian Technical Services Pty Ltd

Friable/Non-Friable: Non-Friable

Date of removal: 9th July 2014

Scope of work: ATS Pty Ltd was engaged to remove asbestos cement debris from ground surfaces within a section of the school's grassy play area. This encompassed the corner between the school and the adjoining day care building, and extended from the school's boundary fence to Jacobson Ave, to the large tree towards the back of the day care building (see photos).

Clearance Inspection following ACM Removal

Inspector: Lamice Ali
Visible materials from areas noted above have been removed as far as reasonably practicable.
No inspection was carried out to areas that were not included in the above scope.

Date and time of inspection: 8th July 2014

Areas not accessed: All areas below ground surfaces
All areas below dense leaf litter and thick vegetation

Evidence of PVA/sealant application: N/A

Visual inspection satisfactory: Yes

Comments: Parsons Brinckerhoff inspected the area and visually determined that the asbestos containing materials have been removed as far as reasonably practicable. This inspection certificate is valid for areas which were visually accessible at the time of inspection. The areas can now be returned to normal use.

WIP Airborne Fibre Monitoring

WIP air monitoring conducted: Yes

Results of air monitoring satisfactory: Yes

Comments: All Work In Progress monitoring was found to be below the detection limit of <0.01fibres/mL

Conclusion

Based on the above findings the work area/site is considered safe for reoccupation.

Issued by: Lamice Ali

Signature:

Date issued: 09/07/2014

Standard Limitations of a Clearance Certificate

A visual inspection was undertaken to assess whether visible asbestos material was removed. Inspections are only carried out to the areas detailed to be removed and are conducted where access is available. Specifically no inspection has been carried out to areas that may require further remediation to verify the presence of asbestos. It should be noted that no inspection can be regarded as absolute and that additional asbestos may be encountered or uncovered upon further inspection, building works, or excavation. The inspection was carried out at the time of the completion of the remediation works and was dependent upon site conditions at that time. Parsons Brinckerhoff accepts no responsibility or liability for the completeness of the removal. Comments above regarding the aspects of the inspection also form limitations. The contractor's responsibilities included:

- Ensuring that work methods and procedures comply with the relevant legislation, codes of practice and industry standards, and undertake work in according with technical specifications.
- Employing suitably trained, skilled and competent staff.
- Ensuring that contractors are inducted in safe work procedures for asbestos materials/products.
- Obtaining the necessary approvals from regulatory authorities prior to starting any asbestos removal or maintenance activities.
- Ensuring that all work is conducted in a safe and competent manner.

Photograph 1: work area facing tree, towards the back end of the day care building.

Photograph 2: work area to Jacobson Ave.

Asbestos Clearance Inspection Report

Prepared for:

Cardno NSW/ACT

Address:

Kyeemagh Public School, Beehag St, Kyeemagh NSW

Asbestos Clearance Inspection Report

EnviroX Consulting Report – 2233 / Version 1 final

Report Details	
Job Number	2233
Client	Cardno NSW/ACT
Address	Kyeemagh Public School, Beehag St, Kyeemagh NSW
Date of Inspection	10.11.2018
Date of Air Monitoring	10.11.2018
Date of Report	11.11.2018
Asbestos removalist	Australasian Technical Services
Subject area	Kyeemagh Public School, playground area, area immediately south east of preschool, 2x test pits, top of soil following test pitting (Refer to Appendix A – Photographs)

Introduction

As per Cardno NSW/ACT's request, EnviroX Consulting has conducted an asbestos clearance inspection following the test pitting works within the subject area on the 10th of November 2018. The details of the inspection are contained within the following pages of this report.

The scope of works for EnviroX consulting is to complete;

- Completion of SWMS prior to works commencing;
- Visual inspection of the subject area following the test pitting works;
- Asbestos air monitoring during the test pitting works; and
- Preparation of an Asbestos Clearance Inspection Report outlining the details and findings of the site inspection.

The survey works and production of this report have been undertaken in accordance with the requirements of:

- WHS Regulation 2017.
- WHS Act 2011.
- NSW Code of Practice: How to Manage and Control Asbestos in the Workplace (2016).
- NSW Code of Practice: How to Safely Remove Asbestos (2016).

Site Inspection Details

Visual inspection of the subject area at the time of inspection revealed no asbestos containing materials on the soil surface following the test pitting works.

Asbestos air monitoring undertaken during the test pitting works revealed that the concentrations of airborne fibres were below 0.01 fibre/mL (Refer to Appendix B – Laboratory reports).

All areas outside the specified subject area are not included within this report and may contain asbestos containing materials.

Restrictions and limitations upon clearance Certificate

This asbestos clearance inspection report is restricted to the subject area detailed above. The details within this report are of the site during the inspection only. Areas adjacent to and below the subject area are outside the scope of this report and may contain asbestos materials. This report is based on findings at the time of the inspection, erosion events such as but not limited to wind and traffic (pedestrian or vehicle), may/will expose asbestos containing material beneath the surface which is not included within this report.

If asbestos is found or presumed within this site, EnviroX should be contacted to conduct an inspection and assess the risks associated with the material found.

This report does not provide a complete evaluation of the condition of the site; it is limited to the scope defined as above. Should information become available regarding site conditions including previously unknown sources of contamination, EnviroX reserves the right to review the report in relation to the additional information.

Conclusions

Based on the information presented in this report, it is in the opinion of EnviroX Consulting that;

- Visual inspection of the subject area at the time of inspection revealed there was no asbestos containing materials on the soil surface;
- EnviroX Consulting deems the subject area **safe** for reoccupation;
- Asbestos air monitoring undertaken during the works revealed that the concentration of airborne fibres was below 0.01 fibres/mL;
- This report should be taken as giving an overall idea of the site inspection. Each section must be read in conjunction with the whole of this report, including attachments, no one section should be taken out of this report and read separately; and
- Remain diligent and adhere to the limitation and restrictions stated within this report.

Written and Assessed by:

Zeyn Ismail
Licensed Asbestos Assessor LA001123
M. Sc. Env. Sc

Ismail

Appendix A – Photographs

Photograph 1. Subject area – top of soil to former 2x test pits, no visible asbestos containing materials in area adjacent to test pits

Photograph 2. Subject area –test pit

Photograph 3. Subject area – test pit

Appendix B – Laboratory Results

Asbestos Air Monitoring – 2233-AAM1

Job Number	2233
Client	Cardno NSW/ACT
Address	Kyeemagh Public School, Beehag St, Kyeemagh NSW
Date of Monitoring	10.11.2018

Date	Sample ref	Monitor location	Air Flow	Time on	Time off	Total Min	Volume (L)	Fields	Fibre Count	Conc fibre/mL
10.11.2018	2233-A19	1	2L/min	07:51	11:58	233	471.5	100	1.0	<0.01
10.11.2018	2233-A88	2	2L/min	07:52	11:59	233	471.5	100	1.5	<0.01
10.11.2018	2233-A321	3	2L/min	07:53	11:59	234	473.5	100	0.0	<0.01

Monitor locations:

1 North eastern boundary fence of playground, 5m north of kindergarten building, attached to metal fence
2 North eastern boundary fence of playground, 5m south of kindergarten building, attached to metal fence
3 Southern boundary fence of playground, 15m west of north eastern boundary fence, attached to metal fence

Flowmeter – EXC3 – Calibration factor 1.0118 on 2L/min

Contact us

EnviroX Consulting Pty Ltd
ABN – 83611405942
Suite 4.03, 5 Celebration Drive, Bella Vista NSW
www.EnviroXconsulting.com.au

Zeyn Ismail
Project Manager / Lead Occupational Hygienist
0401163516
Zeyn@enviroxconsulting.com.au

AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD
ABN 36 088 095 112

Our ref: ASET69235 / 72415 / 1 - 3
Your ref: 2233 – AAM1 - Kyeemagh
NATA Accreditation No: 14484.

10 November 2018

EnviroX Consulting
4.03, 5 Celebration Drive
Bella Vista NSW 2153

Attn: Mr Zeyn Ismail

Air Monitoring for Airborne Asbestos

1. Introduction:

This report presents the results of three control air monitoring samples carried out* on 10 November 2018 by Envirox Consulting for analysis for airborne asbestos. Three air monitoring samples were forwarded for analysis by Envirox Consulting on 10 November 2018.

2. Methods:

In accordance with the Work-safe Australia Guidance Notes on Membrane Filter Method on estimating air borne asbestos fibres – Second Edition – NOHSC – 3003 (2005) and **Safer Environment Method 2** as supplementary work instructions.

3. Results:

Location	Fibers / 100 Fields	Fibers/mL
10/11/2018		
1- ASET69235 / 72415 / 1 – A19	**1.0 / 100**	**< 0.01**
2- ASET69235 / 72415 / 2 – A88	**1.5 / 100**	**< 0.01**
3- ASET69235 / 72415 / 3 – A321	**0.0 / 100**	**< 0.01**

Reported by,

Mahen De Silva. BSc, MSc, Grad Dip (Occ Hyg)
Occupational Hygienist / Approved Counter
Approved Signatory

WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025.

***Air monitoring was carried out by Envirox Consulting's trained staff and ASET do not take responsibility for that part.**

SUITE 710 / 90, GEORGE STREET, HORNSBY NSW 2077 – P.O. BOX 1644 HORNSBY WESTFIELD NSW 1635
PHONE: (02) 99872183 EMAIL: info@ausset.com.au WEBSITE: www.ausset.com.au

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NSW
GOVERNMENT
SafeWork NSW

Locked Bag 2906, Lisarow NSW 2252
Customer Experience 13 10 50
ABN 81 913 830 179 | www.safework.nsw.gov.au

Our Ref: D18/225067

19 November 2018

Ben Withnall
Cardno NSW/ACT Pty Ltd
Level 9, 203 Pacific Highway
St Leonards NSW 2065

Dear Mr Withnall

RE SITE: Lot 1 DP120095 & Lot 1 DP335734

I refer to your site search request received by SafeWork NSW on 13 November 2018 requesting information on Storage of Hazardous Chemicals for the above site.

A search of the records held by SafeWork NSW has not located any records pertaining to the above-mentioned premises.

For further information or if you have any questions, please call us on 13 10 50 or email licensing@safework.nsw.gov.au

Yours sincerely

Customer Service Officer
Customer Experience - Operations
SafeWork NSW

LOTSEARCH ENVIRO PROFESSIONAL

Date: 01 Nov 2018 16:29:43

Reference: LS004515 EP

Address: Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Disclaimer:
The purpose of this report is to provide an overview of some of the site history, environmental risk and planning information available, affecting an individual address or geographical area in which the property is located. It is not a substitute for an on-site inspection or review of other available reports and records. It is not intended to be, and should not be taken to be, a rating or assessment of the desirability or market value of the property or its features.
You should obtain independent advice before you make any decision based on the information within the report.
The detailed terms applicable to use of this report are set out at the end of this report.

Table of Contents

Location Confidences

Where Lotsearch has had to georeference features from supplied addresses, a location confidence has been assigned to the data record. This indicates a confidence to the positional accuracy of the feature. Where applicable, a confidence is given under the field heading “LocConf” or “Location Confidence”.

LC Code	Location Confidence
Premise match	Georeferenced to the site location / premise or part of site
General area or suburb match	Georeferenced with the confidence of the general/approximate area
Road match	Georeferenced to the road or rail
Road intersection	Georeferenced to the road intersection
Feature is a buffered point	Feature is a buffered point
Land adjacent to geocoded site	Land adjacent to Georeferenced Site

Dataset Listing

Datasets contained within this report, detailing their source and data currency:

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features Onsite	No. Features within 100m	No. Features within Buffer
Cadastre Boundaries	Dept. Finance, Services & Innovation	01/11/2018	01/11/2018	Daily	-	-	-	-
Topographic Data	Dept. Finance, Services & Innovation	17/07/2018	17/07/2018	As required	-	-	-	-
List of NSW contaminated sites notified to EPA	Environment Protection Authority	17/10/2018	17/10/2018	Monthly	1000	0	0	2
Contaminated Land Records of Notice	Environment Protection Authority	10/10/2018	10/10/2018	Monthly	1000	0	0	2
Former Gasworks	Environment Protection Authority	04/10/2018	11/10/2017	Monthly	1000	0	0	0
National Waste Management Facilities Database	Geoscience Australia	07/08/2018	07/03/2017	Quarterly	1000	0	0	0
EPA PFAS Investigation Program	Environment Protection Authority	05/10/2018	05/10/2018	Monthly	2000	0	0	1
EPA Other Sites with Contamination Issues	Environment Protection Authority	11/01/2018	11/01/2018	As required	1000	0	0	0
Licensed Activities under the POEO Act 1997	Environment Protection Authority	01/11/2018	01/11/2018	Monthly	1000	0	0	0
Delicensed POEO Activities still Regulated by the EPA	Environment Protection Authority	01/11/2018	01/11/2018	Monthly	1000	0	0	2
Former POEO Licensed Activities now revoked or surrendered	Environment Protection Authority	01/11/2018	01/11/2018	Monthly	1000	1	1	6
UPSS Environmentally Sensitive Zones	Environment Protection Authority	14/04/2015	12/01/2010	As required	1000	1	1	1
UBD Business to Business Directory 1991 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business to Business Directory 1991 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0
UBD Business to Business Directory 1986 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business to Business Directory 1986 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0
UBD Business Directory 1982 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business Directory 1982 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0
UBD Business Directory 1978 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business Directory 1978 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0
UBD Business Directory 1975 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business Directory 1975 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0
UBD Business Directory 1970 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	2	2
UBD Business Directory 1970 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	1
UBD Business Directory 1965 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	2	2
UBD Business Directory 1965 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	3
UBD Business Directory 1961 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	2	3
UBD Business Directory 1961 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	3
UBD Business Directory 1950 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	1	1
UBD Business Directory 1950 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features Onsite	No. Features within 100m	No. Features within Buffer
UBD Business Directory Drycleaners & Motor Garages/Service Stations (Premise & Intersection Matches)	Hardie Grant			Not required	500	0	0	0
UBD Business Directory Drycleaners & Motor Garages/Service Stations (Road & Area Matches)	Hardie Grant			Not required	500	-	0	6
Points of Interest	Dept. Finance, Services & Innovation	12/10/2018	12/10/2018	Quarterly	1000	2	2	38
Tanks (Areas)	Dept. Finance, Services & Innovation	15/10/2018	15/10/2018	Quarterly	1000	0	0	0
Tanks (Points)	Dept. Finance, Services & Innovation	15/10/2018	15/10/2018	Quarterly	1000	0	0	0
Major Easements	Dept. Finance, Services & Innovation	12/10/2018	12/10/2018	Quarterly	1000	0	0	4
State Forest	Dept. Finance, Services & Innovation	18/01/2018	18/01/2018	As required	1000	0	0	0
NSW National Parks and Wildlife Service Reserves	NSW Office of Environment & Heritage	18/01/2018	30/09/2017	Annually	1000	0	0	0
Hydrogeology Map of Australia	Commonwealth of Australia (Geoscience Australia)	08/10/2014	17/03/2000	As required	1000	1	1	2
Botany Groundwater Management Zones	NSW Department of Primary Industries	15/03/2018	01/10/2005	As required	1000	0	0	0
Groundwater Boreholes	NSW Dept. of Primary Industries - Water NSW; Commonwealth of Australia (Bureau of Meteorology)	24/07/2018	23/07/2018	Annually	2000	2	23	368
Geological Units 1:100,000	NSW Dept. of Industry, Resources & Energy	20/08/2014		None planned	1000	1	-	7
Geological Structures 1:100,000	NSW Dept. of Industry, Resources & Energy	20/08/2014		None planned	1000	0	-	0
Naturally Occurring Asbestos Potential	NSW Dept. of Industry, Resources & Energy	04/12/2015	24/09/2015	Unknown	1000	0	0	0
Soil Landscapes	NSW Office of Environment & Heritage	12/08/2014		None planned	1000	1	-	6
Atlas of Australian Soils	CSIRO	19/05/2017	17/02/2011	As required	1000	1	1	1
Environmental Planning Instrument - Acid Sulfate Soils	NSW Department of Planning and Environment	23/10/2018	12/10/2018	As required	500	1	-	-
Atlas of Australian Acid Sulfate Soils	CSIRO	19/01/2017	21/02/2013	As required	1000	1	2	3
Dryland Salinity - National Assessment	National Land and Water Resources Audit	18/07/2014	12/05/2013	None planned	1000	0	0	0
Dryland Salinity Potential of Western Sydney	NSW Office of Environment & Heritage	12/05/2017	01/01/2002	None planned	1000	-	-	-
Mining Subsidence Districts	Dept. Finance, Services & Innovation	13/07/2017	01/07/2017	As required	1000	0	0	0
SEPP 14 - Coastal Wetlands	NSW Planning and Environment	17/12/2015	24/10/2008	Annually	1000	0	0	0
SEPP 26 - Littoral Rainforest	NSW Planning and Environment	17/12/2015	05/02/1988	Annually	1000	0	0	0
SEPP 71 - Coastal Protection	NSW Planning and Environment	17/12/2015	01/08/2003	Annually	1000	0	0	0
SEPP Major Developments 2005	NSW Planning and Environment	09/03/2013	25/05/2005	Under Review	1000	0	0	0
SEPP Strategic Land Use Areas	NSW Planning and Environment	01/08/2017	28/01/2014	Annually	1000	0	0	0
EPI - Land Zoning	NSW Planning and Environment	23/10/2018	12/10/2018	Quarterly	1000	2	4	32
EPI - Minimum Lot Size	NSW Planning and Environment	23/10/2018	12/10/2018	Quarterly	0	1	-	-
EPI - Height of Buildings	NSW Planning and Environment	23/10/2018	12/10/2018	Quarterly	0	1	-	-
EPI - Floor Space Ratio	NSW Planning and Environment	23/10/2018	12/10/2018	Quarterly	0	1	-	-
EPI - Land Application	NSW Planning and Environment	23/10/2018	12/10/2018	Quarterly	0	1	-	-
EPI - Land Reservation Acquisition	NSW Planning and Environment	23/10/2018	12/10/2018	Quarterly	0	1	-	-
State Heritage Register - Curtilages	NSW Office of Environment & Heritage	18/10/2018	19/01/2018	Quarterly	1000	0	0	3

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features Onsite	No. Features within 100m	No. Features within Buffer
Environmental Planning Instrument - Heritage	NSW Department of Planning and Environment	10/09/2018	27/07/2018	Quarterly	1000	0	0	6
Bush Fire Prone Land	NSW Rural Fire Service	08/08/2018	31/07/2018	Quarterly	1000	0	0	0
Native Vegetation of the Sydney Metropolitan Area	NSW Office of Environment & Heritage	01/03/2017	16/12/2016	As required	1000	1	1	11
RAMSAR Wetlands	Commonwealth of Australia Department of the Environment	08/10/2014	24/06/2011	As required	1000	0	0	0
Groundwater Dependent Ecosystems	Bureau of Meteorology	14/08/2017	15/05/2017	Unknown	1000	0	0	0
Inflow Dependent Ecosystems Likelihood	Bureau of Meteorology	14/08/2017	15/05/2017	Unknown	1000	0	0	0
NSW BioNet Species Sightings	NSW Office of Environment & Heritage	29/10/2018	29/10/2018	Daily	10000	-	-	-

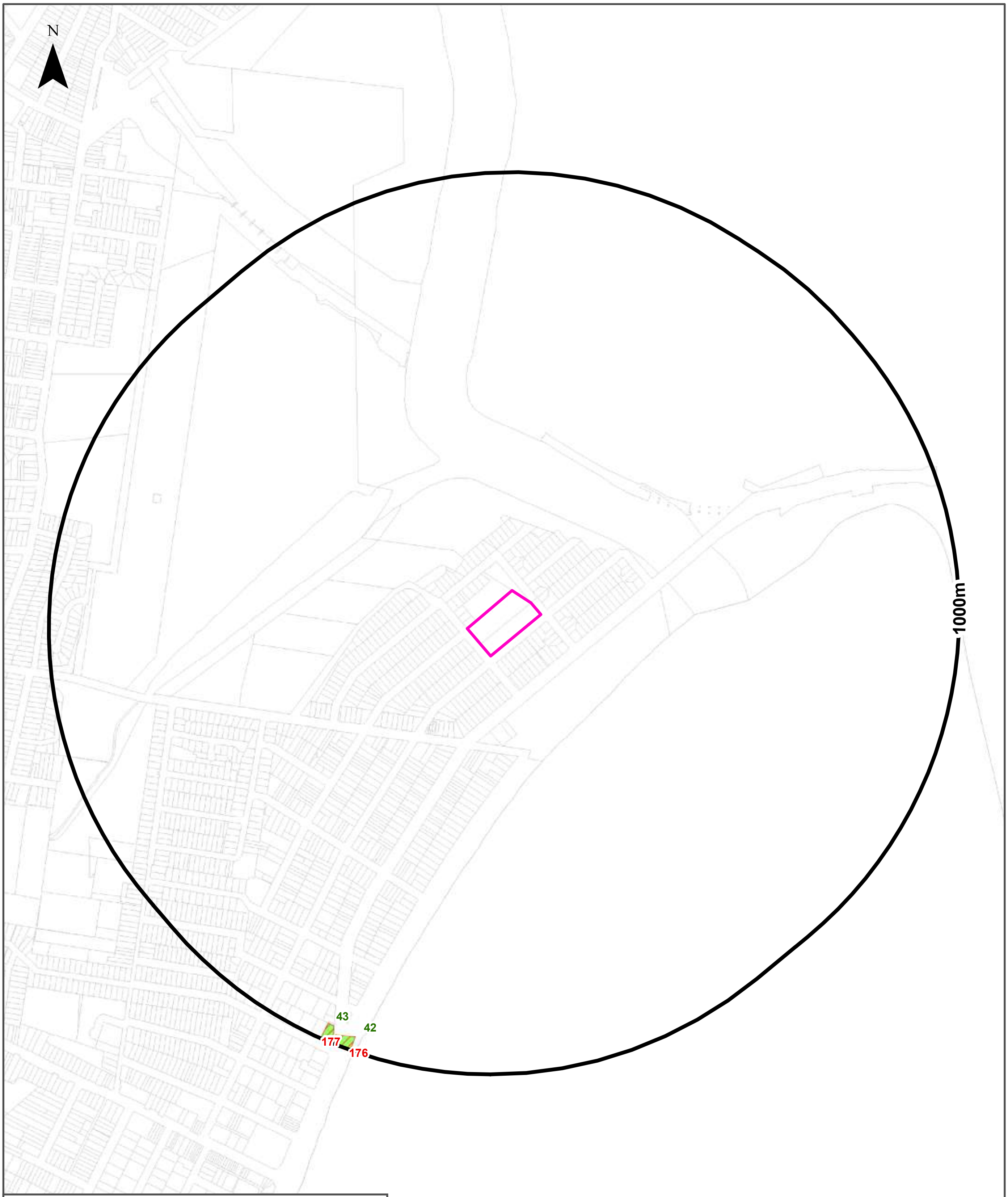
Aerial Imagery 2017

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Scale: 0 25 50 100 Meters	Data Source Aerial Imagery: © 2018 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.	Coordinate System: GDA 1994 MGA Zone 56	Date: 01 November 2018

Contaminated Land & Waste Management Facilities

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216



Legend

- ▭ Site Boundary
- ▭ Report Buffer
- ▭ Property Boundary
- ▨ Contaminated Land List
- ▨ Former Gasworks
- 🟩 Contaminated Land Record of Notice
- ▨ Waste Management Facilities

Scale:
0 100 200 400 600
Meters

Data Sources: Property Boundaries & Topographic Data:
© Department Finance, Services & Innovation 2018

Coordinate System:
GDA 1994 MGA Zone 56

Date: 02 November 2018

Contaminated Land & Waste Management Facilities

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

List of NSW contaminated sites notified to EPA

Records from the NSW EPA Contaminated Land list within the dataset buffer:

Map Id	Site	Address	Suburb	Activity	Management Class	Status	Location Confidence	Dist (m)	Direction
177	Shell Service Station Brighton Le Sands & adjacent land	2 General Holmes Drive	Brighton-Le-Sands	Service Station	Contamination formerly regulated under the CLM Act	Current EPA List	Premise Match	960m	South West
176	Cook Park	General Holmes Drive	Brighton-Le-Sands	Service Station	Contamination formerly regulated under the CLM Act	Current EPA List	Premise Match	966m	South

The values within the EPA site management class in the table above, are given more detailed explanations in the table below:

EPA site management class	Explanation
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the Environmental Planning and Assessment Act 1979 (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination currently regulated under CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record of Notices.
Contamination currently regulated under POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the Protection of the Environment Operations Act 1997 (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the Protection of the Environment Operations Act 1997 (POEO Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the Environmental Planning and Assessment Act 1979 (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the Contaminated Land Management Act 1997 (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record of Notices.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997. A regulatory approach is being finalised.
Regulation under the CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the Contaminated Land Management Act 1997 is not required.
Under assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or Protection of the Environment Operations Act 1997. Alternatively, the EPA may require information via a notice issued under s77 of the Contaminated Land Management Act 1997 or issue a Preliminary Investigation Order.

NSW EPA Contaminated Land List Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

Contaminated Land & Waste Management Facilities

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Contaminated Land: Records of Notice

Record of Notices within the dataset buffer:

Map Id	Name	Address	Suburb	Notices	Area No	Location Confidence	Distance	Direction
43	Shell Service Station Brighton Le Sands & adjacent land	2 General Holmes Drive	Brighton-le-sands	4 former	3174	Premise Match	960m	South West
42	Cook Park	General Holmes Drive	Brighton-le-sands	6 former	3285	Premise Match	966m	South

Contaminated Land Records of Notice Data Source: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

Terms of use and disclaimer for Contaminated Land: Record of Notices, please visit
http://www.epa.nsw.gov.au/clm/clmdisclaimer.htm

Former Gasworks

Former Gasworks within the dataset buffer:

Map Id	Location	Council	Further Info	Location Confidence	Distance	Direction
N/A	No records in buffer					

Former Gasworks Data Source: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

National Waste Management Site Database

Sites on the National Waste Management Site Database within the dataset buffer:

Site Id	Owner	Name	Address	Suburb	Class	Landfill	Reprocess	Transfer	Comments	Loc Conf	Dist (m)	Direction
N/A	No records in buffer											

Waste Management Facilities Data Source: Geoscience Australia

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EPA PFAS Investigation Program

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Scale:

Data Sources: Property Boundaries & Topographic Data:
© Department Finance, Services & Innovation 2018

Coordinate System:
GDA 1994 MGA Zone 56

Date: 01November 2018

EPA PFAS Investigation Program

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

EPA PFAS Investigation Program

Sites that are part of the EPA PFAS investigation program, within the dataset buffer:

Id	Site	Address	Location Confidence	Distance	Direction
16	Botany Bay area & Georges River	Botany Bay area & Georges River	General Area/ Suburb Match	243m	South

EPA PFAS Investigation Program: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

EPA Other Sites with Contamination Issues

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

EPA Other Sites with Contamination Issues

This dataset contains other sites identified on the EPA website as having contamination issues. This dataset currently includes:

- James Hardie asbestos manufacturing and waste disposal sites
- Radiological investigation sites in Hunter's Hill

Sites within the dataset buffer:

Site Id	Site Name	Site Address	Dataset	Comments	Location Confidence	Distance	Direction
N/A	No records in buffer						

EPA Other Sites with Contamination Issues: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

EPA Activities

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Licensed Activities under the POEO Act 1997

Licensed activities under the Protection of the Environment Operations Act 1997, within the dataset buffer:

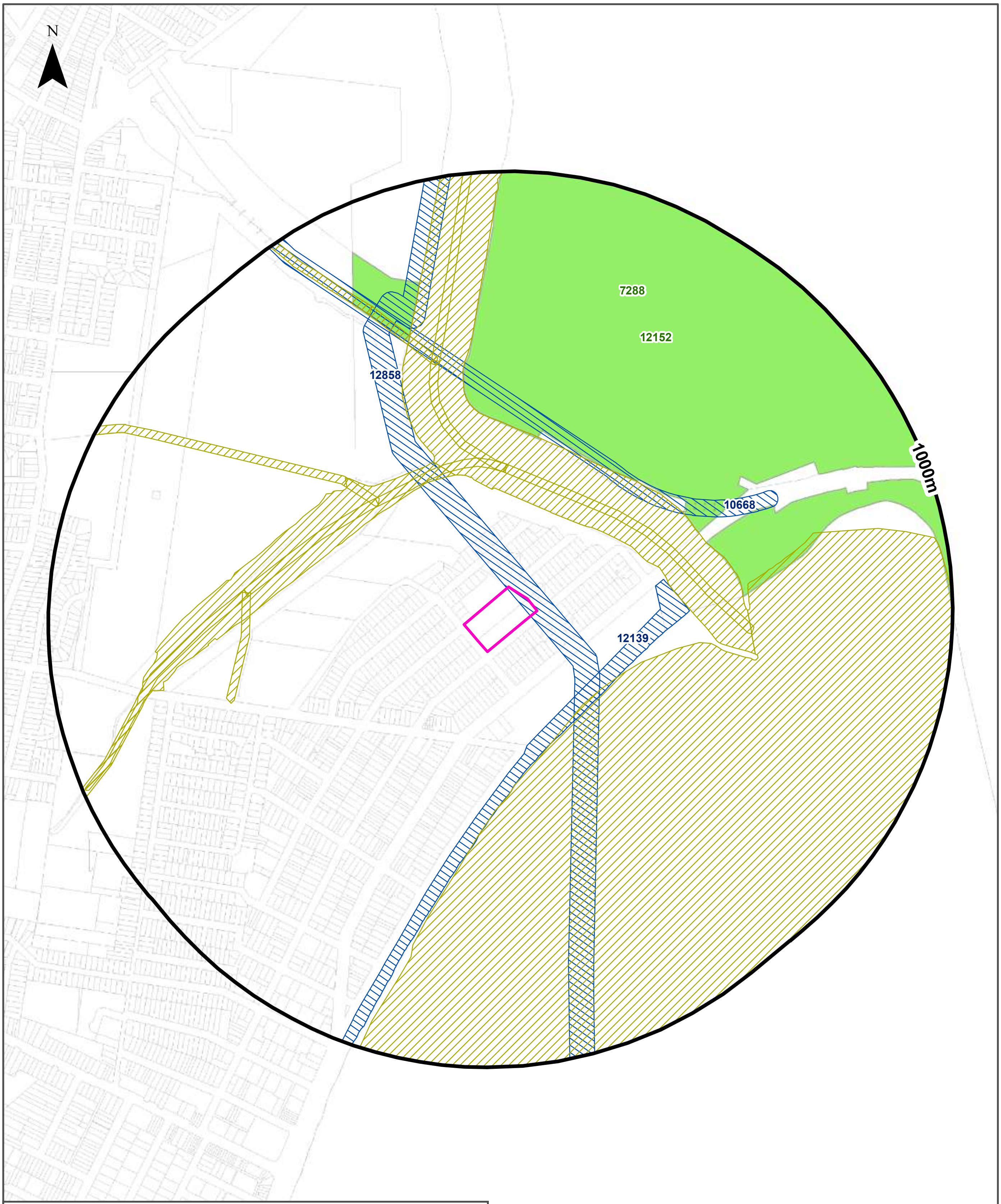
EPL	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
N/A	No records in buffer							

POEO Licence Data Source: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

Delicensed & Former Licensed EPA Activities

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216



Legend

Site Boundary	🟩 Delicensed Activities still Regulated by EPA
Report Buffer	▧ Former Licensed/Regulated Activities (revoked or surrendered)
Property Boundary	▨ Surrendered Licences related to Other Activities on Waterways incl. Application of Herbicides

Scale: 0 100 200 400 600 Meters	Property Boundary Data Source: © Department Finance, Services & Innovation 2018	Coordinate System: GDA 1994 MGA Zone 56	Date: 01 November 2018

EPA Activities

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Delicensed Activities still regulated by the EPA

Delicensed activities still regulated by the EPA, within the dataset buffer:

Licence No	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
7288	SYDNEY AIRPORT CORPORATION LIMITED	SYDNEY AIRPORT	241 O'RIODAN STREET	MASCOT	Hazardous, Industrial or Group A Waste Generation or Storage	Premise Match	361m	North East
12152	QANTAS AIRWAYS LIMITED	Qantas Jet Base	Sydney Airport	MASCOT	Hazardous, Industrial or Group A Waste Generation or Storage	Premise Match	361m	North East

Delicensed Activities Data Source: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

Former Licensed Activities under the POEO Act 1997, now revoked or surrendered

Former Licensed activities under the Protection of the Environment Operations Act 1997, now revoked or surrendered, within the dataset buffer:

Licence No	Organisation	Location	Status	Issued Date	Activity	Loc Conf	Distance	Direction
12858	MCCONNELL DOWELL CONSTRUCTORS (AUST) PTY LTD	Various streets from Kurnell to Erskineville, including the pipeline route across Botany Bay, KURNELL, NSW 2231	Surrendered	01/05/2008	Water-based extractive activity, Miscellaneous licensed discharge to waters (at any time)	Network of Features	0m	Onsite
4653	LUHRMANN ENVIRONMENT MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW	Surrendered		Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	205m	-
4838	Robert Orchard	Various Waterways throughout New South Wales - SYDNEY NSW 2000	Surrendered		Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	205m	-
6630	SYDNEY WEED & PEST MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW - PROSPECT, NSW, 2148	Surrendered		Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	205m	-
12139	WARD CIVIL & ENVIRONMENTAL ENGINEERING PTY LTD	Lady Robinson Beach Restoration, Taylor Bar and Kyeemagh Bar Borrow Pits, DOLLS POINT, NSW 2219	Surrendered	19/05/2004	Water-based extractive activity	Network of Features	210m	South
10668	BILFINGER BERGER PROJECT INVESTMENTS PTY LTD	M5 EAST BETWEEN KINGS GEORGES RD, BEVERLY HILLS & GENERAL HOLMES DRIVE, KYEEMAGH, EARLWOOD, NSW 2206	Surrendered	05/06/2001	Road construction	Road Match	349m	North

Former Licensed Activities Data Source: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

UPSS Sensitive Zones

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Scale:

UPSS Data Source: Environment Protection Authority
© Dept of Environment, Climate Change & Water (NSW)

Coordinate System:
GDA 1994 MGA Zone 56

Date: 01 November 2018

Historical Business Directories

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

1991 Business to Business Directory Records Premise or Road Intersection Matches

Records from the 1991 UBD Business to Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
N/A	No records in buffer				

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1991 Business to Business Directory Records Road or Area Matches

Records from the 1991 UBD Business to Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer			

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Historical Business Directories

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

1986 Business to Business Directory Records Premise or Road Intersection Matches

Records from the 1986 UBD Business to Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
N/A	No records in buffer				

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1986 Business to Business Directory Records Road or Area Matches

Records from the 1986 UBD Business to Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer			

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Historical Business Directories

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

1982 Business Directory Records Premise or Road Intersection Matches

Records from the 1982 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
N/A	No records in buffer				

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1982 Business Directory Records Road or Area Matches

Records from the 1982 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer			

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Historical Business Directories

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

1978 Business Directory Records Premise or Road Intersection Matches

Records from the 1978 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
N/A	No records in buffer				

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1978 Business Directory Records Road or Area Matches

Records from the 1978 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer			

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Historical Business Directories

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

1975 Business Directory Records
Premise or Road Intersection Matches

Records from the 1975 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
N/A	No records in buffer				

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1975 Business Directory Records
Road or Area Matches

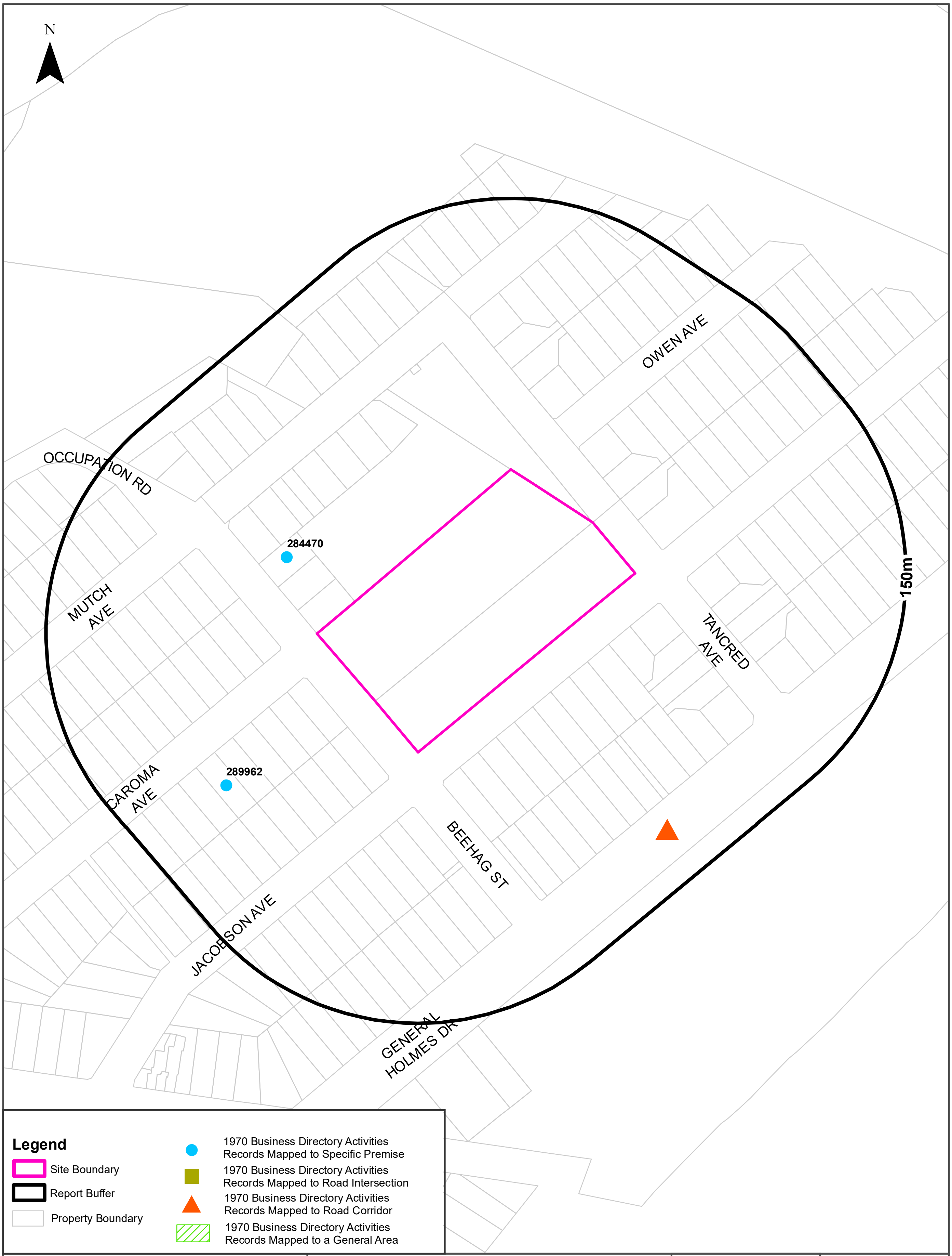
Records from the 1975 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer			

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1970 Historical Business Directory Records

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216



Legend

🟪 Site Boundary

⬛ Report Buffer

☐ Property Boundary

● 1970 Business Directory Activities Records Mapped to Specific Premise

■ 1970 Business Directory Activities Records Mapped to Road Intersection

▲ 1970 Business Directory Activities Records Mapped to Road Corridor

▨ 1970 Business Directory Activities Records Mapped to a General Area

Scale:

Data Sources: Universal Business Directories (UBD) - Derived Data Licensed from Hardie Grant.
Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System:
GDA 1994 MGA Zone 56

Date:
01 November 2018

Historical Business Directories

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

1970 Business Directory Records
Premise or Road Intersection Matches

Records from the 1970 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
CLUBS & SPORTING BODIES (C487)	N.S.W. Leagues Club Bowling Club, 2 Beehag St., Kyeemagh	284470	Premise Match	43m	West
DIVERS (D415)	Gray,J.W.& Gray M.J.W., 27 Caroma Ave., North Brighton-le- Sands	289962	Premise Match	93m	South West

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1970 Business Directory Records
Road or Area Matches

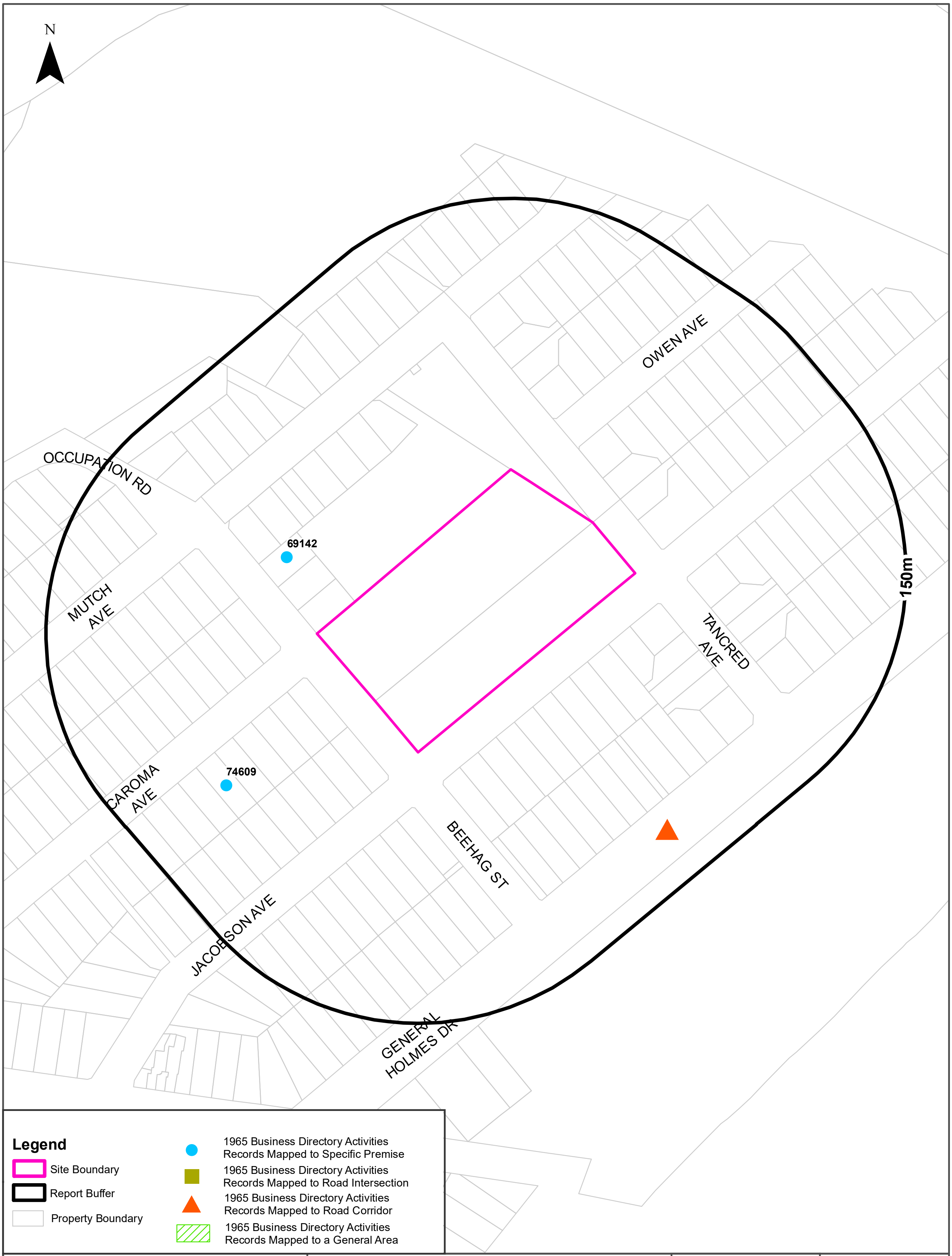
Records from the 1970 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
FRUITERERS/GREENGROCERS (F640)	Arena's Fruit Market, 159 General Holmes Drv., Kyeemagh	306597	Road Match	106m

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1965 Historical Business Directory Records

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216



Scale:

Data Sources: Universal Business Directories (UBD) - Derived Data Licensed from Hardie Grant.
Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System:
GDA 1994 MGA Zone 56

Date:
01 November 2018

Historical Business Directories

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

1965 Business Directory Records
Premise or Road Intersection Matches

Records from the 1965 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
Clubs & Sporting Bodies	N.S.W. Leagues Club Bowling Club, 2 Beehag St., Kyeemagh	69142	Premise Match	43m	West
Divers	Gray, J. W. & Gray M. J. W., 27 Caroma Ave., North Brighton-le-Sands	74609	Premise Match	93m	South West

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1965 Business Directory Records
Road or Area Matches

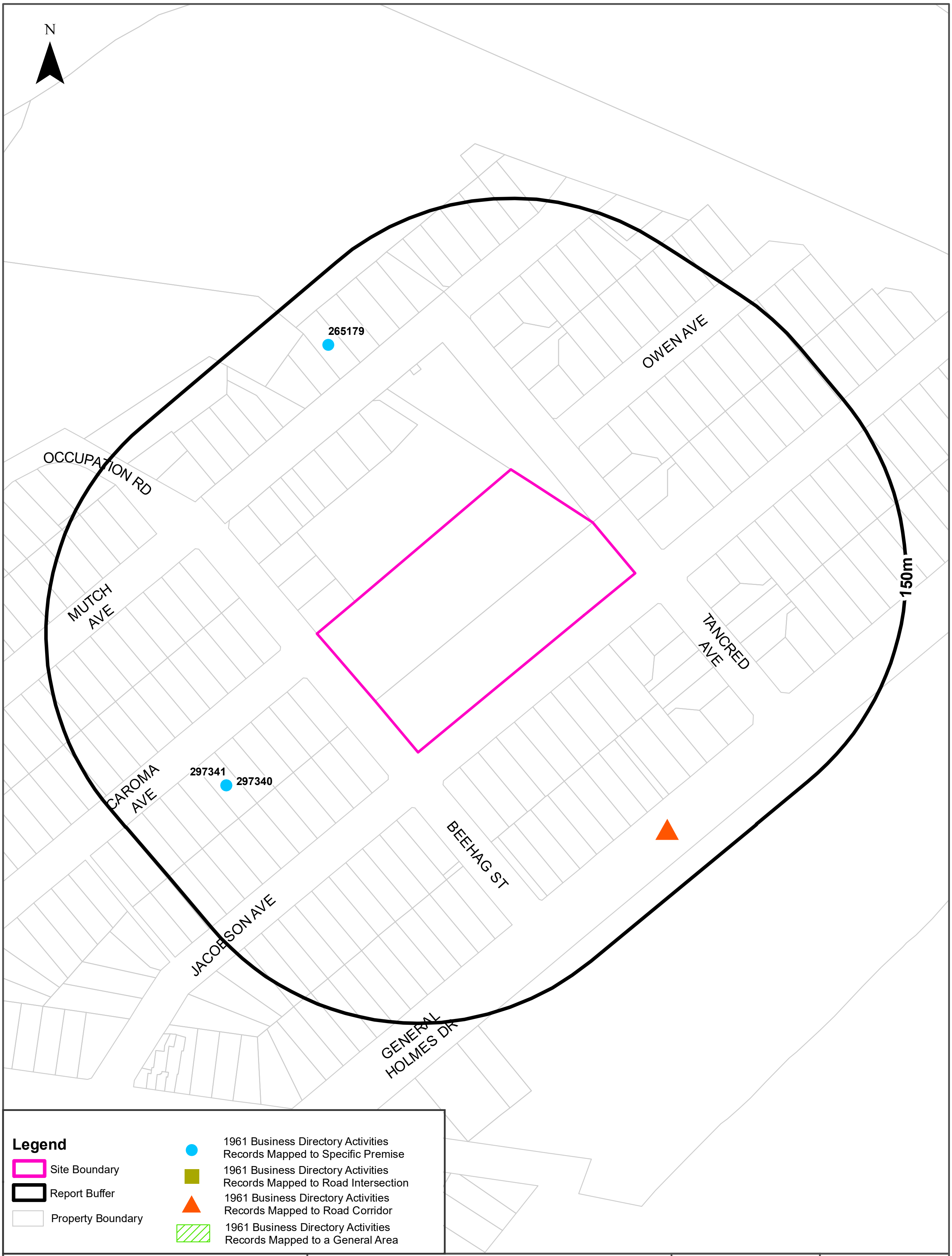
Records from the 1965 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
Boat, Launch & Yacht Builder & Repairers	Riley Bros.., General Holmes Drv., Kyeemagh	52117	Road Match	106m
Boats, Launches & Yachts - For Hire	Riley Bros.., General Holmes Drv., Kyeemagh	52221	Road Match	106m
Milk, Fruit Juice Bars/Confectioners	Smith, N. M., 158 General Holmes Drv., Kyeemagh	115609	Road Match	106m

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1961 Historical Business Directory Records

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216



Scale: 0 25 50 100 150 Meters

Data Sources: Universal Business Directories (UBD) - Derived Data Licensed from Hardie Grant.
Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System:
GDA 1994 MGA Zone 56

Date:
01 November 2018

Historical Business Directories

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

1961 Business Directory Records
Premise or Road Intersection Matches

Records from the 1961 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
DIVERS	Gray, J. W. & Gray M. J. W., 27 Caroma Ave., North Brighton-le-Sands	297340	Premise Match	93m	South West
DIVERS	Gray, J. W., 27 Caroma Ave., Kyeemagh	297341	Premise Match	93m	South West
ACCOUNTANTS & AUDITORS	Howlson, L. J., 72 Mutch Ave., Kyeemagh	265179	Premise Match	118m	North West

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1961 Business Directory Records
Road or Area Matches

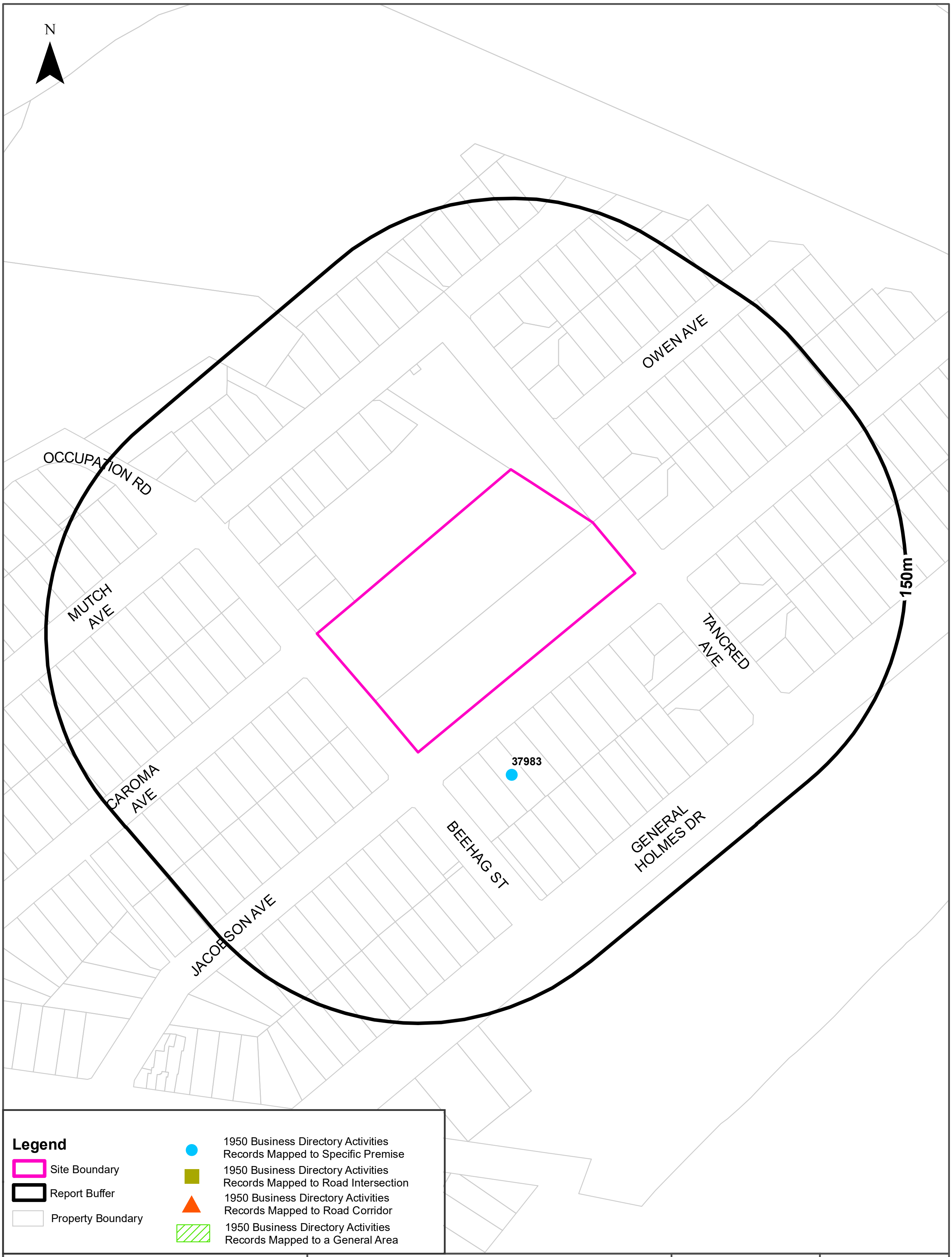
Records from the 1961 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
ARCHITECTURAL DRAFTSMEN	Riley Bros., General Holmes Drive, Kyeemagh	268630	Road Match	106m
ARMATURE WINDERS	Riley Bros., General Holmes Drive, Kyeemagh	268672	Road Match	106m
MILK, FRUIT JUICE BARS/CONFECTIONERS	Smith, N. M., 158 General Holmes Drv., Kyeemagh	339629	Road Match	106m

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1950 Historical Business Directory Records

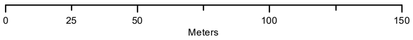
Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216



Legend

🟪	Site Boundary
⬛	Report Buffer
☐	Property Boundary
●	1950 Business Directory Activities Records Mapped to Specific Premise
■	1950 Business Directory Activities Records Mapped to Road Intersection
▲	1950 Business Directory Activities Records Mapped to Road Corridor
▨	1950 Business Directory Activities Records Mapped to a General Area

Scale:



Data Sources: Universal Business Directories (UBD) - Derived Data Licensed from Hardie Grant.
Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System:
GDA 1994 MGA Zone 56

Date:
01 November 2018

Historical Business Directories

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

1950 Business Directory Records Premise or Road Intersection Matches

Records from the 1950 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
ELECTRICAL CONTRACTORS &/OR ELECTRICIANS	Wright Bros., 31 Jacobson Ave., Brighton-le-Sands	37983	Premise Match	43m	South

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1950 Business Directory Records Road or Area Matches

Records from the 1950 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer			

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Historical Business Directories

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Dry Cleaners, Motor Garages & Service Stations Premise or Road Intersection Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Feature Point	Direction
N/A	No records in buffer					

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Historical Business Directories

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Dry Cleaners, Motor Garages & Service Stations Road or Area Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
MOTOR GARAGES & ENGINEERS	Metro Motors, 97 Grand Pde. BRIGHTON-LE-SANDS	347712	**1961**	Road Match	249m
MOTOR GARAGES & SERVICE STATIONS.	Sydney Airport Service Station, General Holmes Rd., Mascot.	65544	**1986**	Road Match	282m
MOTOR GARAGES &/OR ENGINEERS &/OR SERVICE STATIONS.	Sydney Airport Service Station, General Holmes Rd., Mascot.	50918	**1978**	Road Match	282m
MOTOR SERVICE STATIONS - PETROL, OIL	Sydney Airport Service Station, General Holmes Rd., Mascot.	61976	**1975**	Road Match	282m
MOTOR GARAGES &/OR ENGINEERS &/OR SERVICE STATIONS. (M6860)	Sydney Airport Service Station, General Holmes Rd., Mascot. 2020.	57665	**1982**	Road Match	282m
MOTOR SERVICE STATIONS-PETROL,OIL,Etc. (M716)	Sydney Airport Service Station,General Holmes Drv.MASCOT	341525	**1970**	Road Match	282m

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Aerial Imagery 2016

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Legend

- 🟪 Site Boundary
- ⬛ Buffer

Scale:

Data Sources: Aerial Imagery © Department Finance, Services & Innovation

Coordinate System:
GDA 1994 MGA Zone 56

Date: 01 November 2018

Aerial Imagery 2011

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Legend

🟪 Site Boundary

⬛ Buffer 150m

Scale: 0 25 50 100 Meters	Data Source Aerial Imagery: © 2018 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.	Coordinate System: GDA 1994 MGA Zone 56	Date: 01 November 2018

Aerial Imagery 2009

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Scale:
0 25 50 100
Meters

Data Source Aerial Imagery: © 2018 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.

Coordinate System:
GDA 1994 MGA Zone 56

Date: 02 November 2018

Aerial Imagery 2000

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Legend

🟪 Site Boundary

⬛ Buffer 150m

Scale:
0 25 50 100
Meters

Data Source Aerial Imagery: © 2018 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.

Coordinate System:
GDA 1994 MGA Zone 56

Date: 01 November 2018

Aerial Imagery 1991

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Legend

🟪	Site Boundary
⬛	Buffer

Scale:

Data Sources: Aerial Imagery © Department of Finance, Services & Innovation

Coordinate System:
GDA 1994 MGA Zone 56

Date: 01 November 2018

Aerial Imagery 1982

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Legend

🟪 Site Boundary

⬛ Buffer

Scale:

Data Sources: Aerial Imagery © Department of Finance, Services & Innovation

Coordinate System:
GDA 1994 MGA Zone 56

Date: 01 November 2018

Aerial Imagery 1970

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Legend

- Site Boundary
- Buffer

Scale: 0 25 50 100 150 Meters	Data Sources: Aerial Imagery © Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 01 November 2018

Aerial Imagery 1965

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Scale:
0 25 50 100
Meters

Data Source Aerial Imagery:
© NSW Department of Finance, Services & Innovation

Coordinate System:
GDA 1994 MGA Zone 56

Date: 01 November 2018

Aerial Imagery 1961

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Scale:

Data Source Aerial Imagery:
© NSW Department of Finance, Services & Innovation

Coordinate System:
GDA 1994 MGA Zone 56

Date: 01 November 2018

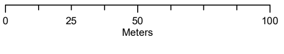
Aerial Imagery 1955

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Legend

▭	Site Boundary
▭	Buffer 150m

Scale:



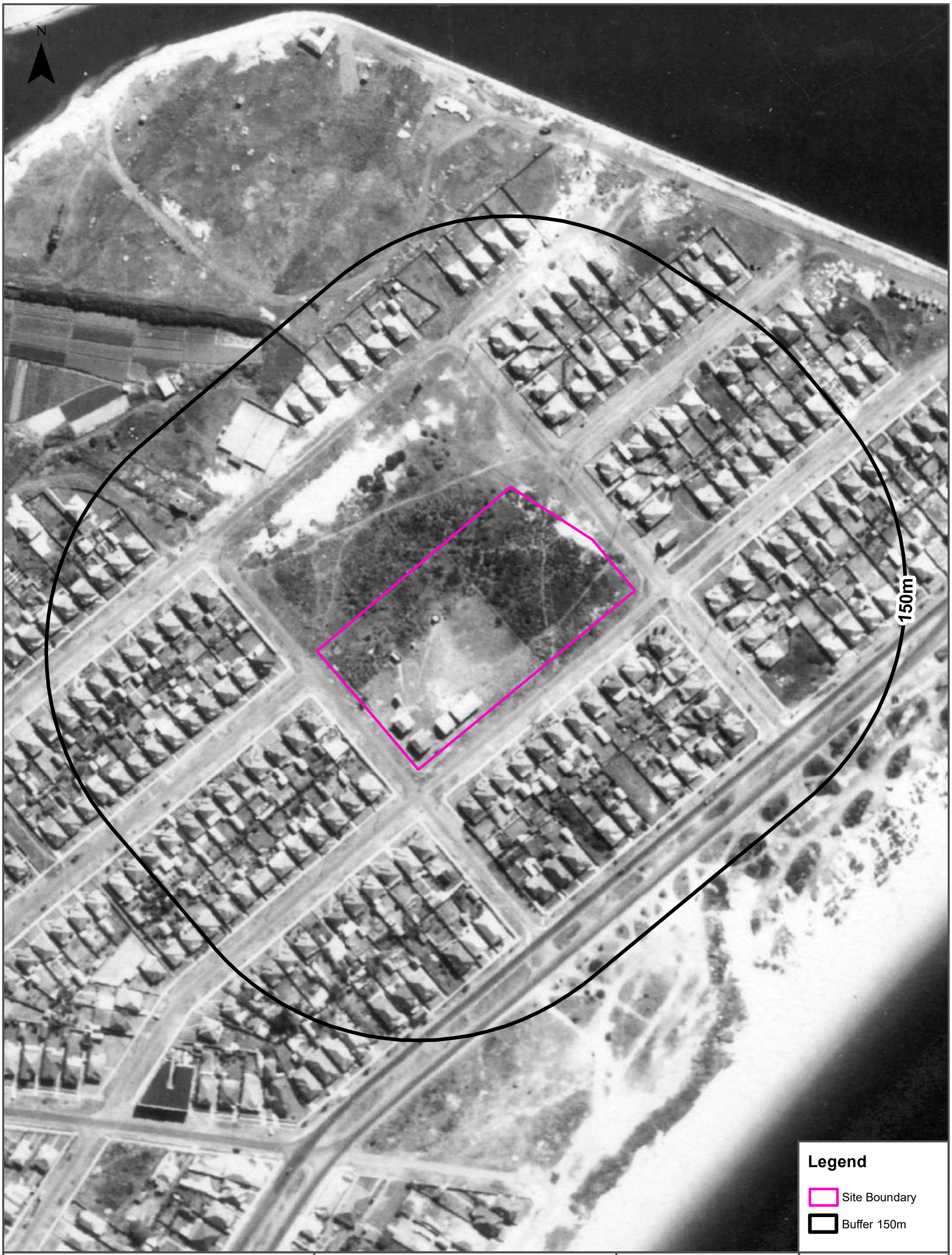
Data Source Aerial Imagery:
© NSW Department of Finance, Services & Innovation

Coordinate System:
GDA 1994 MGA Zone 56

Date: 01 November 2018

Aerial Imagery 1951

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216



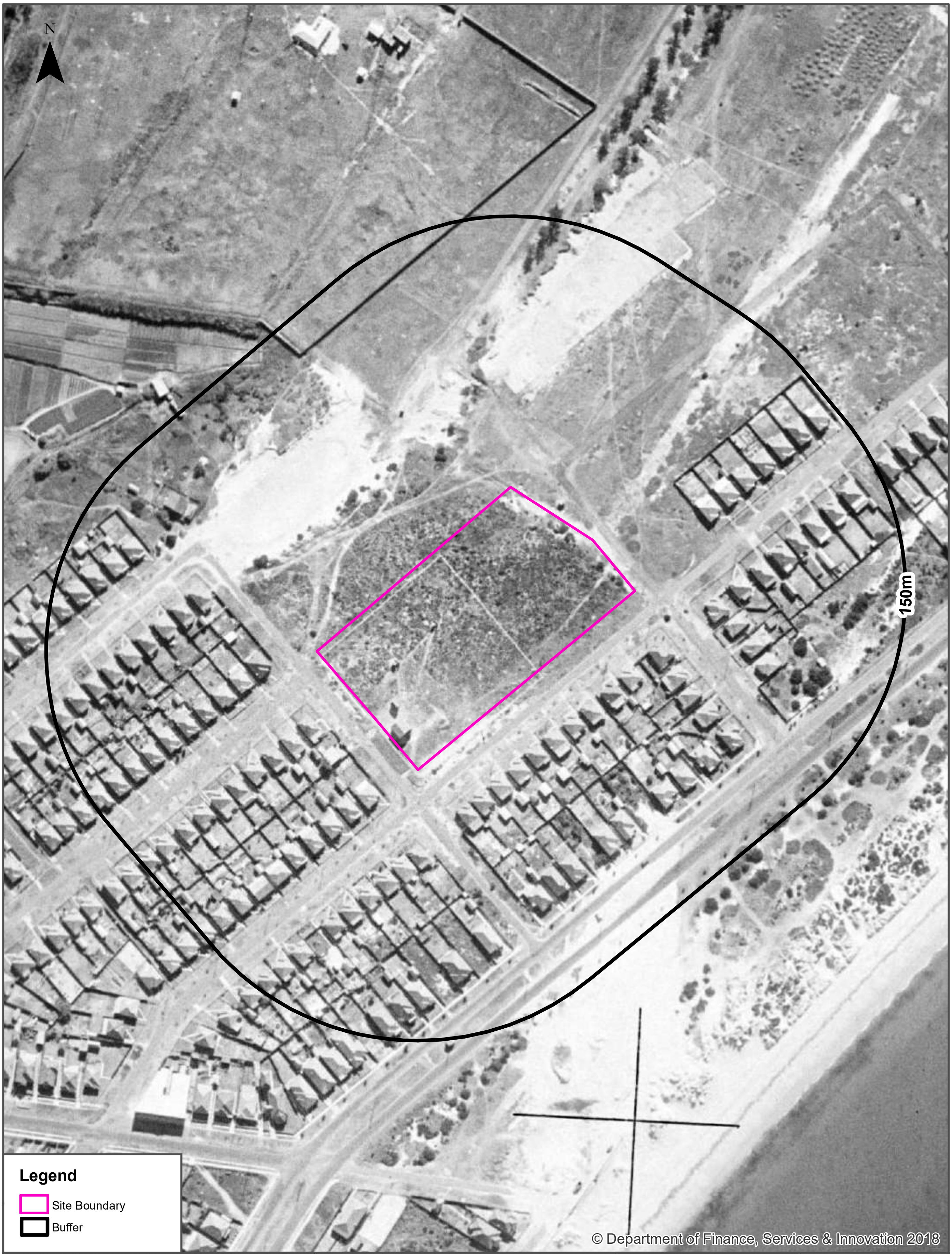
Legend

- 🟪 Site Boundary
- ⬛ Buffer 150m

Scale: 0 25 50 100 Meters	Data Source Aerial Imagery: © NSW Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 01 November 2018

Aerial Imagery 1943

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216



Legend

🟪	Site Boundary
▢	Buffer

Scale:

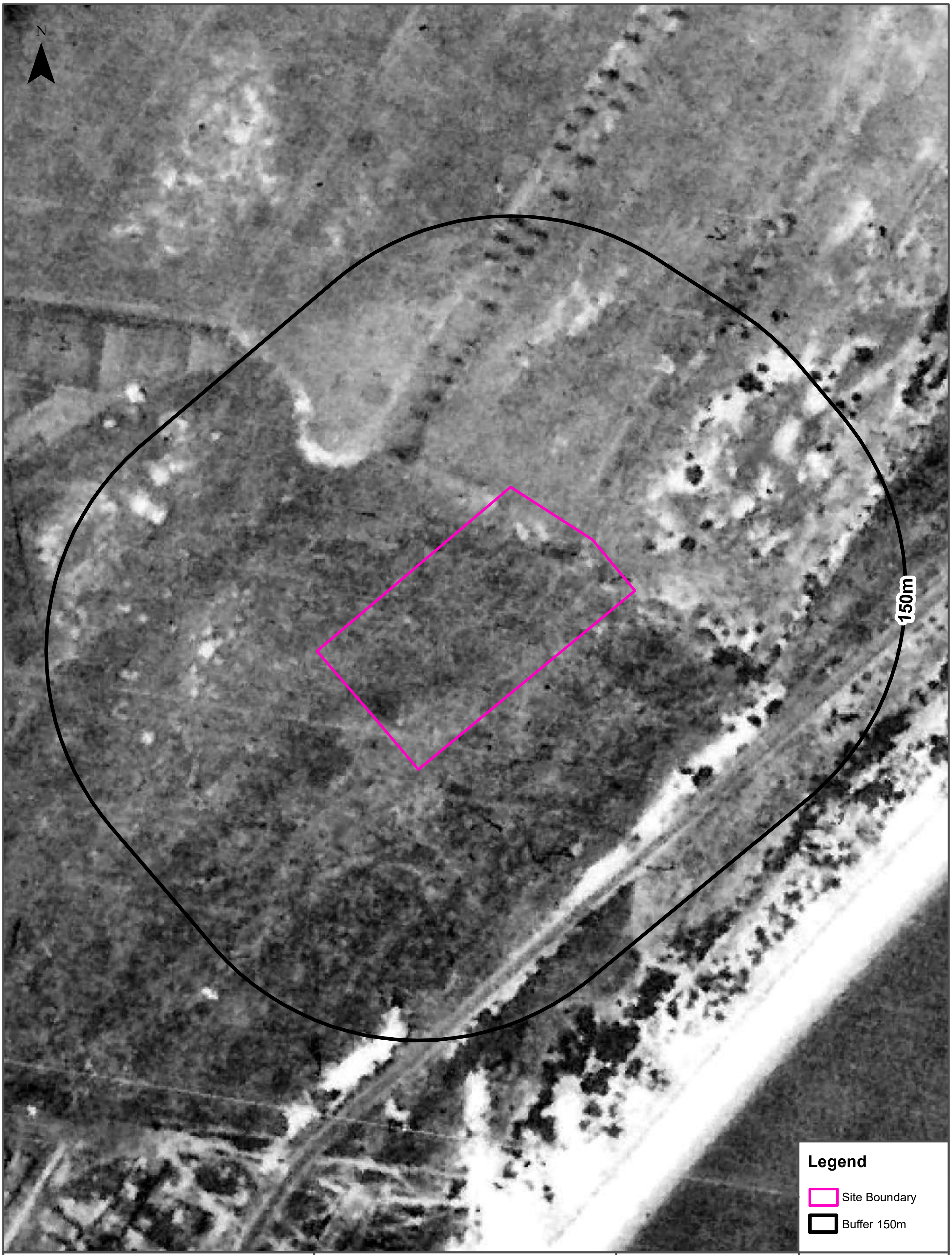
Data Sources: Aerial Imagery © Department of Finance, Services & Innovation

Coordinate System:
GDA 1994 MGA Zone 56

Date: 01 November 2018

Aerial Imagery 1930

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216



Scale: 0 25 50 100 Meters	Data Source Aerial Imagery: © NSW Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 01 November 2018

Topographic Map 2015

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

© Department of Finance, Services & Innovation 2018

Scale: 0 100 200 400 600 Meters	Data Sources: Topographic Map Data © NSW Land and Property Information	Coordinate System: GDA 1994 MGA Zone 56	Date: 01 November 2018

Historical Map 1975

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Please note that due to the inaccuracies in the original maps, the site may not allign to the map correctly.

Legend

🟪	Site Boundary
⬛	Buffer

Scale: 0 125 250 500 750 1,000 1,250 Meters

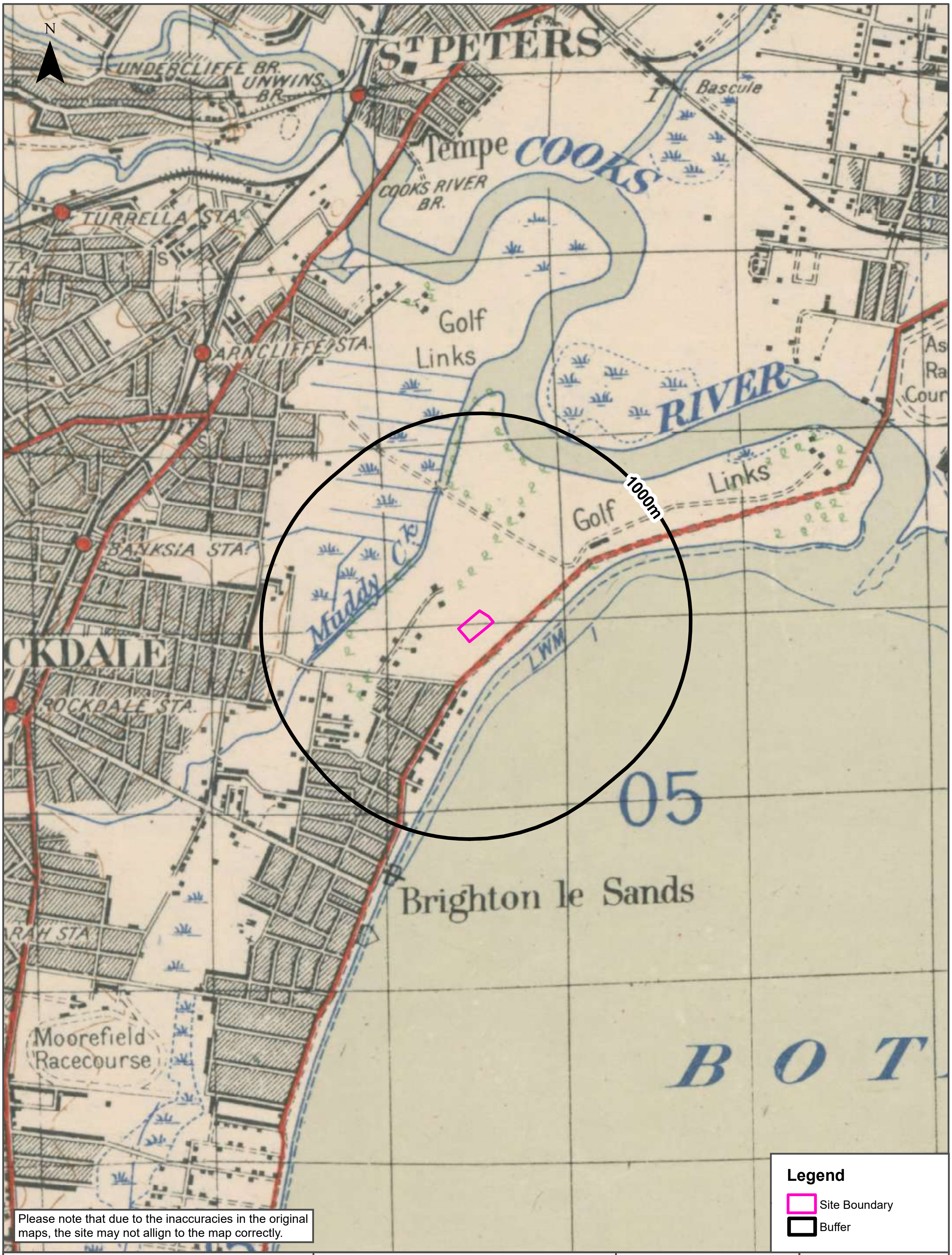
Data Sources: NATMAP 1:100,000
Topographic Maps Geoscience Australia

Coordinate System:
GDA 1994 MGA Zone 56

Date: 01 November 2018

Historical Map 1936

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216



Please note that due to the inaccuracies in the original maps, the site may not allign to the map correctly.

Legend

- Site Boundary
- Buffer

Scale: 0 125 250 500 750 1,000 1,250 Meters

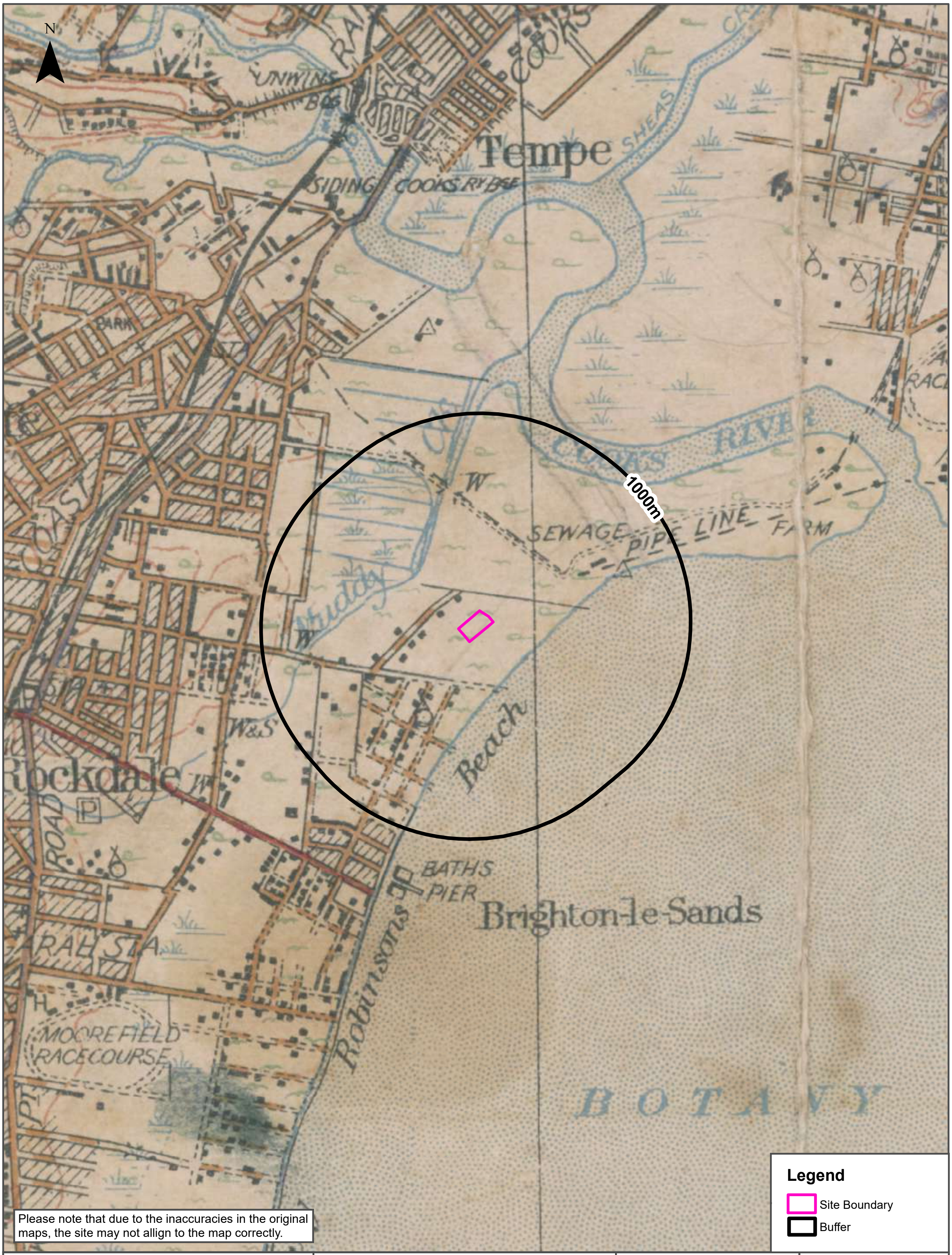
Data Sources: Australia 1:63360,
Produced by Australian Section Imperial General Staff

Coordinate System:
GDA 1994 MGA Zone 56

Date: 01 November 2018

Historical Map 1917

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216



Please note that due to the inaccuracies in the original maps, the site may not allign to the map correctly.

Legend

▢	Site Boundary
▢	Buffer

Scale:
0 125 250 500 750 1,000 1,250
Meters

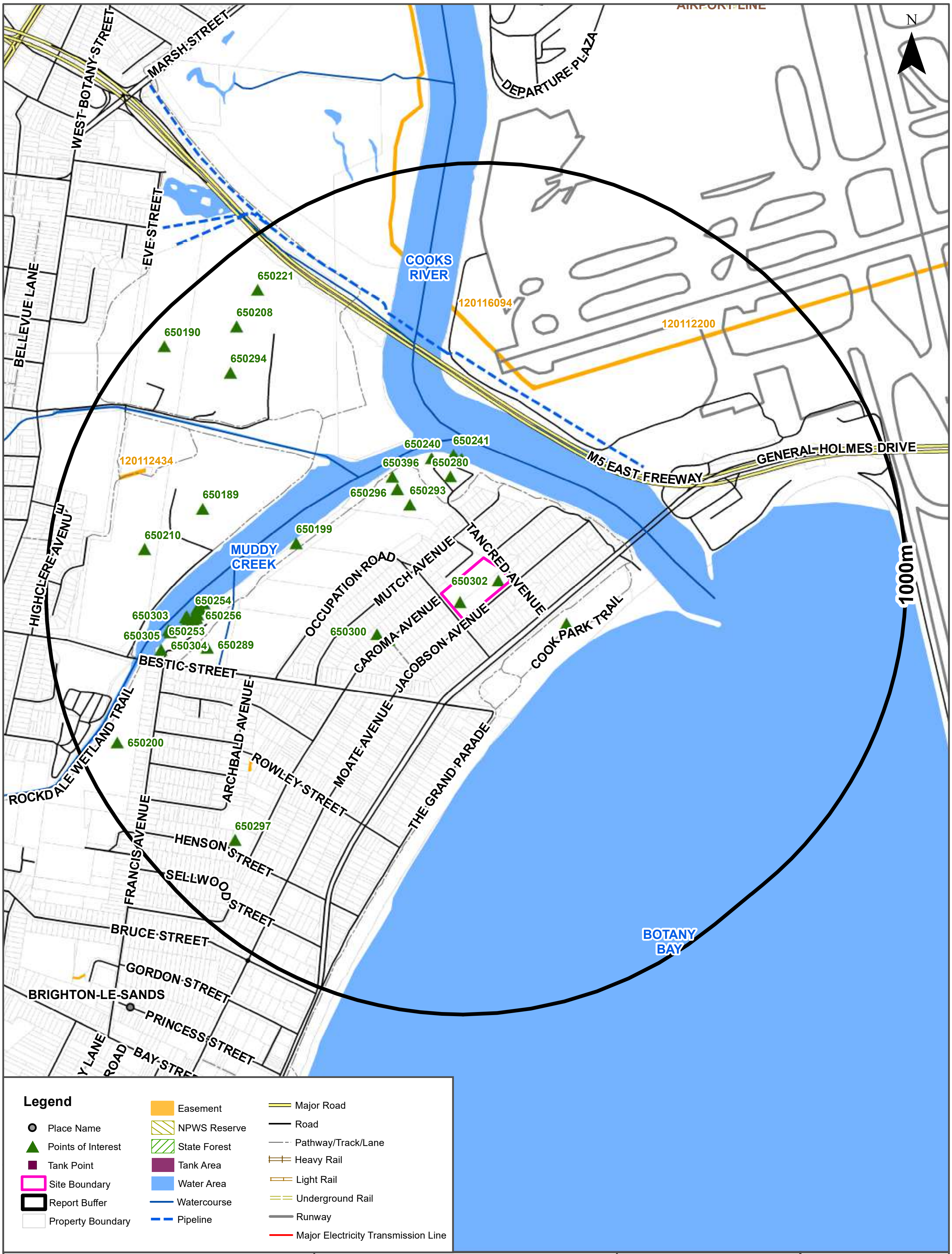
Data Sources: Australia 1:63360,
Produced by Australian Section Imperial General Staff

Coordinate System:
GDA 1994 MGA Zone 56

Date: 01 November 2018

Topographic Features

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216



Scale:

0 100 200 400 600

Meters

Data Sources: Property Boundaries & Topographic Data:
© Department Finance, Services & Innovation 2018

Coordinate System:
GDA 1994 MGA Zone 56

Date: 01 November 2018

Topographic Features

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Points of Interest

What Points of Interest exist within the dataset buffer?

Map Id	Feature Type	Label	Distance	Direction
650230	Primary School	KYEEMAGH INFANTS SCHOOL	0m	Onsite
650302	Child Care Centre	NORTH BRIGHTON PRE-SCHOOL	0m	Onsite
650301	Suburb	KYEEMAGH	177m	South West
650298	Park	COOK PARK	178m	East
650300	Park	MUTCH AVENUE RESERVE	193m	South West
650280	Park	KYEEMAGH RESERVE	223m	North
650293	Club	KYEEMAGH RSL AND COMMUNITY CLUB	224m	North West
650299	Wharf	Wharf	257m	North
650259	Boat Ramp	Boat Ramp	260m	North
650241	Wharf	Wharf	272m	North
650296	Sports Field	HOCKEY FIELD	274m	North West
650240	Picnic Area	Picnic Area	285m	North
650396	Community Facility	ST GEORGE RANDWICK HOCKEY CLUB	306m	North West
650199	Park	MUDDY CREEK RESERVE	389m	West
650295	Wharf	Wharf	601m	West
650289	Park	LANCE STUDDERT RESERVE	608m	West
650249	Wharf	Wharf	611m	West
650258	Boat Ramp	Boat Ramp	619m	West
650250	Wharf	Wharf	620m	West
650257	Slipway	Slipway	622m	West
650254	Wharf	Wharf	625m	West
650256	Slipway	Slipway	627m	West
650255	Slipway	Slipway	632m	West
650189	Sports Centre	ST GEORGE SOCCER STADIUM	641m	West
650252	Wharf	Wharf	644m	West
650253	Wharf	Wharf	646m	West
650251	Wharf	Wharf	650m	West
650304	Wharf	Wharf	691m	West
650305	Wharf	Wharf	693m	West
650303	Wharf	Wharf	696m	West

Map Id	Feature Type	Label	Distance	Direction
650281	Park	FRANK SEARLE GARDENS	723m	West
650210	Park	BARTON PARK	759m	West
650294	Sports Field	AP AUSTIN FIELD	773m	North West
650297	Community Home	JENNY-LYN NURSING HOME	804m	South West
650208	Park	RIVERINE PARK	851m	North West
650221	Sports Field	BASEBALL FIELD	888m	North West
650200	Park	WHITEOAK RESERVE	902m	South West
650190	Golf Course	BARTON PARK GOLF RANGE	940m	North West

Topographic Data Source: © Land and Property Information (2015)
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Topographic Features

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Tanks (Areas)

What are the Tank Areas located within the dataset buffer?
Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
	No records in buffer					

Tanks (Points)

What are the Tank Points located within the dataset buffer?
Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
	No records in buffer					

Tanks Data Source: © Land and Property Information (2015)
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Major Easements

What Major Easements exist within the dataset buffer?
Note. Easements provided by LPI are not at the detail of local governments. They are limited to major easements such as Right of Carriageway, Electrical Lines (66kVa etc.), Easement to drain water & Significant subterranean pipelines (gas, water etc.).

Map Id	Easement Class	Easement Type	Easement Width	Distance	Direction
120112200	Primary	Undefined		444m	North East
120116094	Primary	Undefined		444m	North
120110460	Primary	Undefined		636m	South West
120112434	Primary	Undefined		812m	West

Easements Data Source: © Land and Property Information (2015)
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Topographic Features

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

State Forest

What State Forest exist within the dataset buffer?

State Forest Number	State Forest Name	Distance	Direction
N/A	No records in buffer		

State Forest Data Source: © Land and Property Information (2015)
Creative Commons 3.0 © Commonwealth of Australia http://creativecommons.org/licenses/by/3.0/au/deed.en

National Parks and Wildlife Service Reserves

What NPWS Reserves exist within the dataset buffer?

Reserve Number	Reserve Type	Reserve Name	Gazetted Date	Distance	Direction
N/A	No records in buffer				

NPWS Data Source: © Land and Property Information (2015)
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Elevation Contours (m AHD)

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Legend

- Elevation Contour (m AHD)
- Site Boundary
- Report Buffer
- Property Boundary

Accuracy & Currency: This contour data can be up to 0.4 of the contour interval out in height and must therefore not be used for any design or engineering works, but only as a general guide to topography. Gaps may occur along contour lines due to vertical topography, obscured topography in the source photography such as buildings, dense vegetation or dead ground, or the fact that original buildings have been replaced in the intervening thirty years since the original contour capture.

Scale:

Data Sources: Property Boundaries & Topographic Data:
© Department Finance, Services & Innovation 2018

Coordinate System:
GDA 1994 MGA Zone 56

Date: 01 November 2018

Hydrogeology & Groundwater

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Hydrogeology

Description of aquifers on-site:

Description
Porous, extensive highly productive aquifers

Description of aquifers within the dataset buffer:

Description
Porous, extensive aquifers of low to moderate productivity
Porous, extensive highly productive aquifers

Hydrogeology Map of Australia : Commonwealth of Australia (Geoscience Australia)
Creative Commons 3.0 © Commonwealth of Australia http://creativecommons.org/licenses/by/3.0/au/deed.en

Botany Groundwater Management Zones

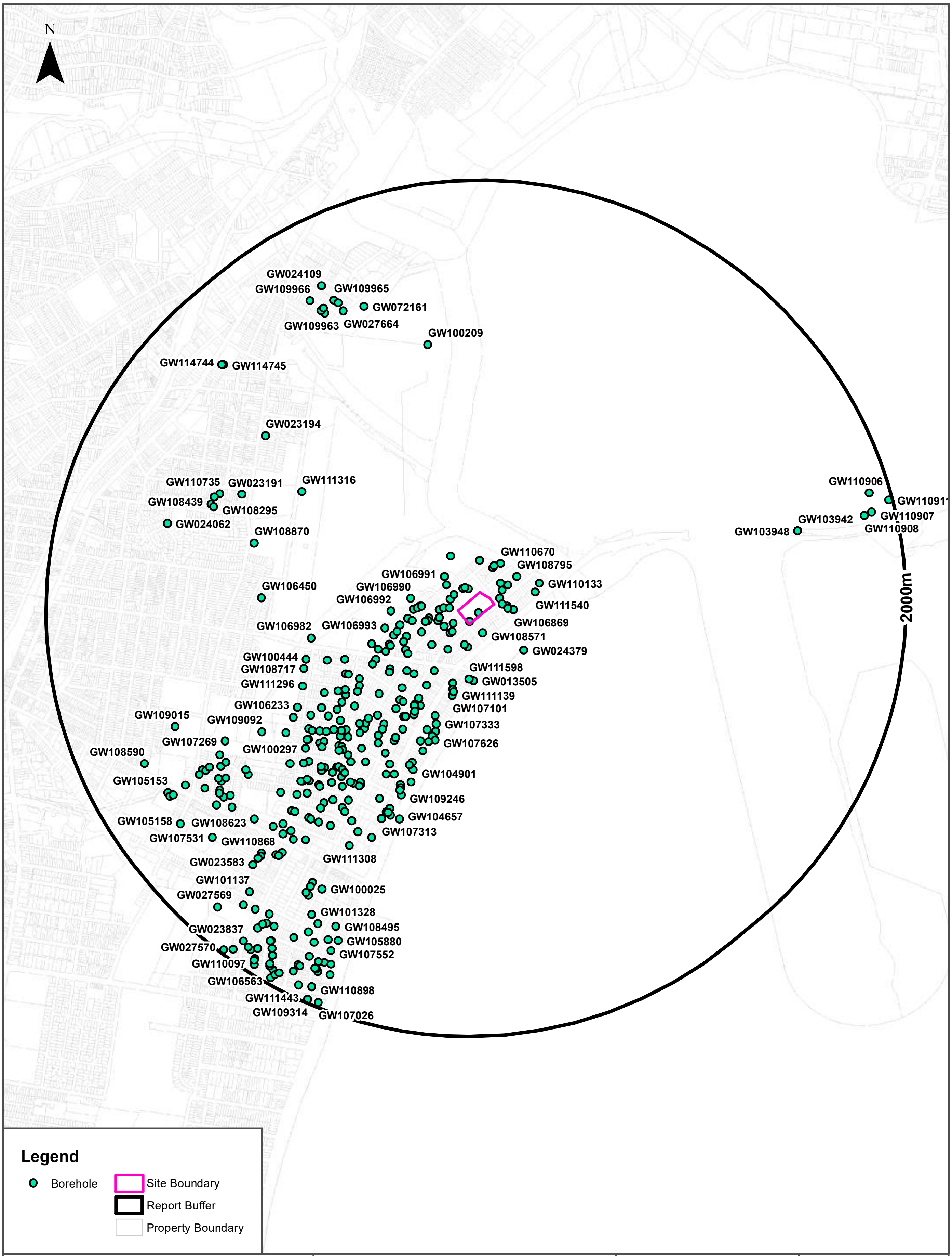
Groundwater management zones relating to the Botany Sand Beds aquifer within the dataset buffer:

Management Zone No.	Restriction	Distance	Direction
N/A	No records in buffer		

Botany Groundwater Management Zones Data Source : NSW Department of Primary Industries

Groundwater Boreholes

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216



Scale:

Data Sources: Property Boundaries & Topographic Data:
© Department Finance, Services & Innovation 2018

Coordinate System:
GDA 1994 MGA Zone 56

Date: 01 November 2018

Hydrogeology & Groundwater

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Groundwater Boreholes

Boreholes within the dataset buffer:

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW023455	10BL016606, 10WA112828	Spear	Private	Domestic	General Use		01/12/1965	4.80	4.90	Good				0m	Onsite
GW109028	10BL161062, 10BL603289, 10WA114576	Bore	School	Domestic, Recreation - High Security	Domestic		02/12/2002	8.00	8.00	Good	6.00	0.500		0m	Onsite
GW109111	10BL602325, 10WA114488	Spear	Private	Domestic	Domestic		24/07/2008	5.00		Good	2.44	1.000		40m	East
GW101797	10BL157238, 10WA113130	Bore		Domestic	Domestic		24/10/1995	5.80	5.80	Good	2.75	1.000		41m	East
GW107210	10BL164823, 10WA113865	Spear	Private	Domestic	Domestic		05/07/2005	6.00	6.00		4.00	0.500		42m	West
GW105991	10BL162716, 10WA113476	Spear	Private	Domestic	Domestic		23/03/2004	6.00	6.00	Good	3.00	0.500		48m	North
GW109155	10BL162412, 10WA113424	Spear	Private	Domestic	Domestic		05/08/2008	8.85		Good	5.49	1.000		56m	South West
GW108702	10BL601658, 10WA114400	Spear	Private	Domestic	Domestic		19/04/2007	6.00	6.00	Good	4.00	0.500		62m	North West
GW111939	10BL603158, 10WA114572	Spear	Private	Domestic	Domestic		23/01/2010	6.00	6.00		3.00			64m	North West
GW102799	10BL159561, 10WA113292	Bore		Domestic	Domestic		07/02/2000	7.63	7.63	Good				65m	West
GW101163	10BL157034, 10WA113102	Spear	Private	Domestic	Domestic		06/09/1995	5.79	5.79	Good	3.66	0.800		66m	East
GW109654	10BL602631, 10WA114526	Spear	Private	Domestic	Domestic		23/09/2008	8.23	8.24		4.88	1.000		69m	West
GW102218	10BL159069, 10WA113271	Spear	Private	Domestic	Domestic		02/03/1999	6.71	6.71	Good	3.96	1.000		71m	North West
GW102693	10BL159440, 10WA113290	Bore		Domestic	Domestic		29/09/1999	7.63	7.63	Good	4.27			71m	North West

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW101022	10BL156997, 10WA113096	Bore	Private	Domestic	Domestic		30/08/1995	6.10	6.10	Good	3.97	1.000		72m	East
GW107052	10BL164906, 10WA113882	Spear	Private	Domestic	Domestic		07/04/2005	5.80	5.80	Good	2.44	1.000		73m	North East
GW108571	10BL601351, 10WA114326	Spear	Private	Domestic	Domestic		20/02/2007	8.85	8.85	Good	5.49	1.000		74m	South
GW108239	10BL600633, 10WA114184	Spear	Private	Domestic	Domestic		01/11/2006	7.63	7.63		4.25	1.000		85m	South West
GW109673	10BL165462, 10WA113981	Bore	Private	Domestic	Domestic		18/12/2008	7.00						90m	West
GW100685	10BL156955, 10WA113089	Bore	Private	Domestic	Domestic		25/08/1995	6.10	6.10	Good	3.66	1.000		90m	North East
GW105774	10BL162646, 10WA113464	Spear	Private	Domestic	Domestic		07/01/2004	7.32	7.32		4.58	1.000		95m	West
GW108582	10BL600591, 10WA114173	Spear	Private	Domestic	Domestic		28/01/2007	8.54	8.54	Good	4.27	1.000		98m	South West
GW024202	10BL018635, 10WA112964	Spear	Private	Domestic	General Use		01/01/1966	6.70	6.70	Good				100m	South West
GW108179	10BL165949, 10WA114065	Spear	Private	Domestic	Domestic		29/07/2006	9.76	9.76		5.49	1.000		101m	South
GW106869	10BL164561, 10WA113810	Bore		Domestic			08/03/2006							101m	East
GW105674	10BL162727, 10WA113477	Spear	Private	Domestic	Domestic		02/02/2004	7.02	7.02					107m	West
GW106557	10BL163595, 10WA113624	Spear	Private	Domestic	Domestic		31/07/2004	6.10	6.10	Good	3.50	1.000		110m	North East
GW109280	10BL602494, 10WA114520	Spear	Private	Domestic	Domestic		01/01/2003	7.00	7.00	Good	5.49	1.000		111m	South
GW106014	10BL162673, 10WA113470	Spear	Private	Domestic	Domestic		27/06/2004	7.32	7.32		4.27	1.000		129m	North West
GW106940	10BL162264, 10WA113383	Spear	Private	Domestic	Domestic		16/03/2005	6.00	6.00	Good	3.00	0.500		133m	North East
GW112983	10BL602359, 10WA114496	Spear	Private	Domestic	Domestic		25/02/2008	7.00	7.00		5.00	0.410		142m	West
GW110276	10BL165642, 10WA114007	Spear	Private	Domestic	Domestic		01/01/1999	9.00			2.00	2.500		144m	North East
GW024203	10BL018627, 10WA112960	Spear	Private	Domestic	General Use		01/08/1966	5.40	5.50	Good				151m	West

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW108965	10BL602253, 10WA114474	Spear	Private	Domestic	Domestic		26/06/2008	6.00						152m	North
GW026514	10BL019296, 10WA112984	Spear	Private	Domestic	General Use		01/01/1966	7.90		Good				159m	South West
GW113040	10BL602343, 10WA114492	Spear	Private	Domestic	Domestic		26/05/2009	6.00	6.00					165m	West
GW106991	10BL159771, 10CA114725	Bore		Irrigation	Irrigation		01/01/1950	5.00			1.00	7.000		167m	North West
GW110670	10BL603425, 10WA114581	Spear	Private	Domestic	Domestic		24/11/2009	5.80	5.80	Good	2.13	1.000		170m	North East
GW108795	10BL601787, 10WA114414	Spear	Private	Domestic	Domestic		12/06/2007	6.10	6.10	Good	2.44	1.000		170m	North East
GW106799	10BL163588, 10WA113621	Spear	Private	Domestic	Domestic		07/01/2005	6.00	6.00					176m	West
GW106712	10BL162377, 10WA113419	Spear	Private	Domestic	Domestic		10/01/2005	7.00	7.00	Good	5.00	0.500		183m	West
GW023208		Spear	Private		General Use		01/02/1966	5.40	5.50	Fair				196m	West
GW072785		Spear	Private		Domestic		11/01/1995	7.60	7.60	Good				203m	South West
GW104867	10BL161076, 10WA113325	Bore	Private	Domestic	Domestic		02/12/2002	8.85	8.85		5.80	1.000		203m	South West
GW111540	10BL602643, 10WA114527	Spear	Private	Domestic	Domestic		16/08/2008	8.54	8.54	good	1.49	1.000		208m	East
GW106271	10BL163488, 10WA113593	Spear	Private	Domestic	Domestic		02/08/2004	6.10	6.10	Good	3.05	1.000		215m	West
GW023276	10BL017088	Bore	Private	Recreation (groundwater)	Recreation (groundwater)			8.80	8.80	Good		1.890		224m	North West
GW023524	10BL016652	Spear	Private	Domestic	General Use		01/12/1965	6.00	6.10	Good				225m	West
GW106990	10BL159684, 10CA114729	Bore		Irrigation	Irrigation		01/01/1960	5.00			2.00	7.000		236m	West
GW110133	10BL602919, 10WA114558	Spear	Private	Domestic	Domestic		07/03/2009	8.54	8.54	Good	5.80			243m	East
GW107977	10BL164914, 10WA113886	Spear	Private	Domestic	Domestic		09/05/2005	5.80	5.80		2.75	1.000		246m	West
GW024379	10BL018579, 10WA112959	Spear	Private	Domestic	General Use		01/01/1966	8.20	8.20	Good				268m	South East
GW111598	10BL602766, 10WA114534	Spear	Private	Domestic	Domestic		01/01/1977	9.00	9.00		4.00	0.500		268m	South
GW013505	10BL008612	Spear	Private	Irrigation	General Use		01/01/1950	9.10	9.10	Good				276m	South

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW110846	10BL600611, 10WA114176	Spear	Private	Domestic	Domestic		01/01/2007	8.00			2.00	2.500		278m	South West
GW026881	10BL019636, 10WA112988	(Unknown)	Private	Domestic	General Use		01/12/1966	6.70						284m	South West
GW072283		Spear	Private		Domestic		18/12/1994	7.30	7.30	Good				289m	West
GW023684	10BL017820, 10WA112934	Spear	Private	Domestic	General Use		01/04/1966	7.90	7.90	Good				297m	South
GW100740	10BL157744, 10WA113174	Bore	Private	Domestic	Domestic		24/09/1996	8.23	8.24	Good	5.33	1.000		301m	South West
GW111895	10BL165967, 10WA114070	Spear	Private	Domestic	Domestic		16/01/2006	7.32	7.32		3.96	1.000		311m	West
GW110098	10BL600065, 10WA114090	Spear	Private	Domestic	Domestic		23/02/2006	8.23	8.24	Good	4.58	1.000		317m	South West
GW103152	10BL159732, 10WA113295	Bore		Domestic	Domestic		30/07/2000	8.24	8.24	Good				320m	South West
GW106992	10BL159738, 10CA114727	Bore		Irrigation	Irrigation		01/01/1950	5.00			1.30	7.000		322m	West
GW111121	10BL603637, 10WA114593	Spear	Private	Domestic	Domestic		28/08/2010	10.68	10.68		6.71	1.000		326m	South
GW105565	10BL162106, 10WA113349	Bore		Domestic	Domestic		07/10/2003	7.63	7.63		4.58			332m	West
GW111139	10BL601682, 10WA114405	Spear	Private	Domestic	Domestic		26/04/2007	10.98	10.98	good	7.32	1.000		339m	South
GW107101	10BL163493, 10WA113595	Spear	Private	Domestic	Domestic		08/06/2005	9.00	9.00					356m	South
GW109674	10BL165312, 10WA113958	Spear	Private	Domestic	Domestic		26/04/2005	6.00						362m	South West
GW106720	10BL164139, 10WA113734	Spear	Private	Domestic	Domestic		07/01/2005	6.00	6.00					362m	South West
GW106993	10BL159738, 10CA114727	Bore		Irrigation	Irrigation		01/01/1950	5.00			1.30	7.000		363m	West
GW025713	10BL016457, 10BL165860, 10WA114049	Spear	Private	Domestic, Not Known	Domestic		01/12/1965	7.00	7.00	Good				368m	South West
GW107605	10BL165686, 10WA114020	Spear	Private	Domestic	Domestic		03/10/2005	8.54	8.54	Good	5.49	1.000		370m	South West
GW110441	10BL603268, 10WA114575	Spear	Private	Domestic	Domestic		08/09/2009	8.54	8.54	Good	5.49	1.000		377m	South West

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW109932	10BL602834, 10WA114543	Spear	Private	Domestic	Domestic		28/01/2009	7.32	7.32	Good	4.27	1.000		401m	South West
GW111885	10BL601058, 10WA114276	Spear	Private	Domestic	Domestic		24/01/2007	6.00	6.00		3.00	1.000		429m	South West
GW108744	10BL601462, 10WA114357	Spear	Private	Domestic	Domestic		25/02/2007	9.15	9.15	Good		1.000		433m	South West
GW106948	10BL164789, 10WA113859	Bore		Domestic			31/03/2006							435m	South West
GW108713	10BL601625, 10WA114392	Spear	Private	Domestic	Domestic		10/04/2007	9.15	9.15	Good	6.10	1.000		447m	South West
GW106989	10BL159683, 10CA114731	Bore		Irrigation	Irrigation		01/01/1960	5.00			1.50	13.000		447m	West
GW108547	10BL601149, 10WA114291	Spear	Private	Domestic	Domestic		06/02/2007	7.01	7.02	Good	3.90	1.000		449m	South West
GW107516	10BL163905, 10WA113703	Spear	Private	Domestic	Domestic		01/10/2005	8.00	8.00					461m	South West
GW023291	10BL017194, 10WA112872	Spear	Private	Domestic	General Use		01/11/1965	7.60	7.60					462m	South West
GW109093	10BL602339, 10WA114491	Spear	Private	Domestic	Domestic		22/07/2008	7.00						469m	South West
GW024064	10BL017310, 10WA112886	Spear	Private	Domestic	General Use		01/01/1966	9.10	9.10	Good				473m	South
GW110445	10BL602871, 10WA114549	Spear	Private	Domestic	Domestic		26/05/2009	6.00	6.00					477m	South West
GW108721	10BL601579, 10WA114381	Spear	Private	Domestic	Domestic		16/04/2009	8.54	8.54	Good	4.58	1.000		486m	South West
GW107356	10BL164565, 10WA113812	Spear	Private	Domestic	Domestic		11/08/2005	6.00	6.00	Good	4.00	0.500		488m	South West
GW105768	10BL162582, 10WA113453	Spear	Private	Domestic	Domestic		15/12/2003	7.01	7.02			1.000		492m	South West
GW106659	10BL164037, 10WA113720	Spear	Private	Domestic	Domestic		23/11/2004	7.63	7.63		4.58	1.000		498m	South West
GW108970	10BL602144, 10WA114449	Spear	Private	Domestic	Domestic		26/06/2008	8.23		Good	4.58	1.000		499m	South West
GW107333	10BL165282, 10WA113946	Spear	Private	Domestic	Domestic		21/06/2005	10.37	10.37	Good	7.01	1.000		511m	South
GW105855	10BL163249, 10WA113545	Bore		Domestic			04/05/2005							515m	South West

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW109926	10BL602790, 10WA114538	Spear	Private	Domestic	Domestic		02/02/2009	9.00	9.00	Good	6.00	0.500		542m	South West
GW111311	10BL601516, 10WA114366	Spear	Private	Domestic	Domestic		15/04/2007	9.15	9.15	good	5.80	1.000		544m	South West
GW072405	10BL156076, 10WA113017	Spear	Private	Domestic	Domestic		14/04/1997	8.00	8.00	Good				546m	South
GW113041	10BL602369, 10WA114498	Spear	Private	Domestic	Domestic		01/02/2008	7.00	7.00					549m	South West
GW110554	10BL603346, 10WA114578	Spear	Private	Domestic	Domestic		17/11/2009	9.00	9.00	Good	7.00	0.500		550m	South
GW106631	10BL163920, 10WA113706	Spear	Private	Domestic	Domestic		08/11/2004	8.85	8.85		5.18	1.000		551m	South West
GW107507	10BL163599, 10WA113626	Spear	Private	Domestic	Domestic		07/10/2005	9.00	9.00	Good	7.00	0.500		573m	South
GW031364	10BL024145, 10WA112999	Spear	Private	Domestic	Domestic		01/04/1969	5.40	5.40		3.30	0.150		580m	South West
GW107626	10BL163598, 10WA113625	Spear	Private	Domestic	Domestic		07/10/2005	9.00	9.00		7.00	0.500		586m	South
GW105995	10BL162386, 10WA113420	Spear	Private	Domestic	Domestic		22/04/2004	4.58	4.58		1.52	1.000		597m	West
GW108539	10BL601039, 10WA114269	Spear	Private	Domestic	Domestic		22/01/2007	7.00	7.00	Good	5.00	0.500		600m	South West
GW024585	10BL018849, 10WA112972	Spear	Private	Domestic	General Use		01/01/1966	7.00	7.00	Good				603m	South West
GW106067	10BL163237, 10WA113541	Spear	Private	Domestic	Domestic		06/07/2004	10.06	10.07		7.01	1.000		604m	South
GW110844	10BL164089, 10WA113726	Spear	Private	Domestic	Domestic		24/11/2004	5.49	5.49	Good	1.83	1.000		613m	South West
GW111231	10BL164178, 10WA113748	Spear	Private	Domestic	Domestic		01/01/2007	5.50	5.50					614m	South
GW107346	10BL164916, 10WA113888	Spear	Private	Domestic	Domestic		17/09/2005	9.76	9.76	Good	6.41	1.000		624m	South West
GW106425	10BL163593, 10WA113622	Spear	Private	Domestic	Domestic		03/08/2007	7.00	7.00					625m	South West
GW109166	10BL602412, 10WA114508	Spear	Private	Domestic	Domestic		06/08/2008	8.23		Good	4.88	1.000		628m	South West
GW108252	10BL600656, 10WA114190	Spear	Private	Domestic	Domestic		31/10/2006	9.15	9.15		5.18	1.000		638m	South West

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW108171	10BL600470, 10WA114154	Spear	Private	Domestic	Domestic		23/08/2006	9.00	9.00					655m	South
GW100965	10BL156934, 10WA113085	Spear	Private	Domestic	Domestic		23/08/1995	8.23	8.23	Good	5.18	1.000		656m	South West
GW110917	10BL601419, 10WA114343	Spear	Private	Domestic	Domestic		16/06/2007	8.54	8.54	good	5.49	1.000		661m	South West
GW107302	10BL165309, 10WA113957	Spear	Private	Domestic	Domestic		15/08/2005	6.00	6.00					667m	South West
GW107318	10BL164830, 10WA113866	Spear	Private	Domestic	Domestic		25/04/2005	7.63	7.63	Good	4.58	1.000		669m	South West
GW101032	10BL158261, 10WA113215	Spear	Private	Domestic	Domestic		21/11/1997	7.32	7.32	Good		1.000		671m	South West
GW111224	10BL604178, 10WA114606	Spear	Private	Domestic	Domestic		22/08/2010	6.00	6.00	good	2.00	0.500		679m	West
GW107306	10BL164707, 10WA113839	Spear	Private	Domestic	Domestic		06/09/2005	6.00	6.00					679m	South West
GW105725	10BL162465, 10WA113431	Spear	Private	Domestic	Domestic		28/01/2004	8.85	8.85		5.80	1.000		681m	South West
GW106274	10BL163290, 10WA113552	Spear	Private	Domestic	Domestic		07/06/2004	8.23	8.24	Good	4.88	1.000		694m	South West
GW108434	10BL600980, 10WA114256	Spear	Private	Domestic	Domestic		16/01/2007	8.54	8.54	Good		1.000		697m	South West
GW107121	10BL164816, 10WA113864	Spear	Private	Domestic	Domestic		06/04/2005	5.00	5.00					698m	South West
GW107541	10BL165731, 10WA114035	Spear	Private	Domestic	Domestic		30/10/2005	6.00	6.00					715m	South West
GW108814	10BL601413, 10WA114341	Spear	Private	Domestic	Domestic		24/04/2008	8.23						717m	South West
GW110897	10BL603865, 10WA114599	Spear	Private	Domestic	Domestic		25/05/2010	8.54	8.54	good	5.18	1.000		719m	South West
GW106982	10BL164880, 10WA114733	Bore		Recreation (groundwater)	Recreation (groundwater)		07/02/2005	5.00	5.00					722m	West
GW102991	10BL155245, 10WA113016	Bore		Domestic			20/07/2000		5.00					727m	South West
GW107636	10BL165590, 10WA113999	Bore	Private	Domestic	Domestic		27/11/1993	6.00	6.00					727m	South
GW108599	10BL601378, 10WA114332	Spear	Private	Domestic	Domestic		04/03/2007	12.00	12.00					744m	South West

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GW108096	10BL162751, 10WA113482	Spear	Private	Domestic	Domestic		20/04/2004	7.32	7.32		4.20	1.000		747m	South West
GW101765	10BL157361, 10WA113151	Bore		Domestic	Domestic		01/09/1995	8.00	8.00					747m	South West
GW107972	10BL600190, 10WA114119	Spear	Private	Domestic	Domestic		10/04/2006	7.00	7.00					756m	South West
GW104901	10BL157110, 10WA113114	Bore	Private	Domestic	Domestic		27/09/1995	7.63	7.63	Good	5.18	1.000		758m	South
GW108578	10BL601445, 10WA114351	Spear	Private	Domestic	Domestic		20/03/2007	6.00	6.00					761m	South West
GW100444	10BL157807, 10WA113179	Spear	Private	Domestic	Domestic		22/11/1996	5.49	5.49	Good	1.83	1.000		772m	West
GW107511	10BL165586, 10WA113998	Spear	Private	Domestic	Domestic		15/10/2005	8.23	8.24	Good	5.18	1.000		780m	South West
GW105550	10BL162376, 10WA113418	Bore		Domestic	Domestic		01/12/2003	8.85	8.85		5.79	1.000		781m	South West
GW108454	10BL601082, 10WA114283	Spear	Private	Domestic	Domestic		30/01/2007	9.46	9.46	Good	6.41	1.000		788m	South West
GW108717	10BL601596, 10WA114385	Spear	Private	Domestic	Domestic		06/04/2007	5.18	5.19	Good	1.52	1.000		798m	West
GW017475	10BL008275, 10WA112790	Spear	Private	Domestic	General Use		01/01/1958	7.60	7.60					798m	South West
GW108625	10BL600075, 10WA114092	Spear	Private	Domestic	Domestic		22/11/2007	9.46	9.46	Good	5.49	1.000		803m	South West
GW107442	10BL165472, 10WA113985	Spear	Private	Domestic	Domestic		08/08/2005	9.15	9.15	Good	6.10	1.000		807m	South West
GW109697	10BL165067, 10WA113916	Bore	Private	Domestic	Domestic		07/05/2008	6.10	6.10	Good	2.13	1.000		809m	South West
GW101818	10BL157353, 10WA113146	Bore		Domestic	Domestic		30/05/1995	5.50	5.50					812m	South West
GW107425	10BL165249, 10WA113938	Spear	Private	Domestic	Domestic		08/08/2005	9.00	9.00	Good	7.00	0.500		814m	South West
GW026375	10BL017634, 10WA112918	Bore	Private	Domestic	Not Known		01/09/1966	7.00	7.00	Good				816m	South
GW101222	10BL158318, 10WA113220	Spear	Private	Domestic	Domestic		15/12/1997	7.78	7.78	Good	5.80	1.000		829m	South West
GW108488	10BL600561, 10WA114166	Spear	Private	Domestic	Domestic		15/11/2006	9.76	9.76	Good	6.71	1.000		832m	South West

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GW109258	10BL164850, 10WA113870	Spear	Private	Domestic	Domestic		22/08/2008	7.93		Good		1.000		833m	South West
GW108411	10BL600725, 10WA114205	Spear	Private	Domestic	Domestic		19/01/2007	8.54	8.54	Good	5.18	1.000		837m	South West
GW111296	10BL601515, 10WA114365	Spear	Private	Domestic	Domestic		20/04/2010	5.49	5.49	6000	1.52	1.000		838m	South West
GW110440	10BL602908, 10WA114557	Spear	Private	Domestic	Domestic		26/02/2009	9.00	9.00	Good	7.00	0.500		847m	South West
GW110220	10BL600361, 10WA114141	Spear	Private	Domestic	Domestic		07/09/2006	6.00	6.00					856m	South West
GW111741	10WA117312	Bore	Private	Domestic	Domestic		27/02/2012	11.59	11.59	good	6.41	1.000		862m	South West
GW110953	10BL601610, 10WA114388	Spear	Private	Domestic	Domestic		17/06/2010	8.00	8.00		2.00	2.500		865m	South West
GW107746	10BL164632, 10WA113824	Spear	Private	Domestic	Domestic		10/01/2006	8.00	8.00					865m	South West
GW107852	10BL163741, 10WA113669	Spear	Private	Domestic	Domestic		01/01/2003	6.00	6.00					865m	South West
GW101756	10BL159004, 10WA113269	Bore		Domestic	Domestic		18/01/1999	6.10	6.10	Good	3.36	1.000		866m	South West
GW111498	10BL602489, 10WA114516	Spear	Private	Domestic	Domestic		08/05/2008	11.59	11.59	good	6.41	1.000		873m	South West
GW107985	10BL600160, 10WA114114	Spear	Private	Domestic	Domestic		21/03/2006	5.49	5.49		2.13	1.000		874m	South West
GW110656	10BL601154, 10WA114292	Spear	Private	Domestic	Domestic		24/02/2007	7.93	7.93	Good	4.88	1.000		880m	South West
GW107367	10BL165564, 10WA113993	Spear	Private	Domestic	Domestic		20/09/2005	7.00	7.00					882m	South West
GW101433	10BL158419, 10WA113235	Spear	Private	Domestic	Domestic		15/01/1998	5.49	5.49	Good	2.75	1.000		889m	South West
GW109246	10BL602491, 10WA114518	Spear	Private	Domestic	Domestic		20/08/2008	11.59		Good	6.41	1.000		892m	South
GW110528	10BL603384, 10WA114580	Spear	Private	Domestic	Domestic		19/10/2009	6.71	6.71	Good	3.66	1.000		906m	South West
GW106233	10BL163568, 10WA113613	Spear	Private	Domestic	Domestic		28/05/2005	5.00	5.00					910m	South West
GW107870	10BL600133, 10WA114107	Spear	Private	Domestic	Domestic		13/03/2004	4.27	4.27		1.52	1.000		914m	South West

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GW111743	10BL604393, 10WA114612	Spear	Private	Domestic	Domestic		28/03/2011	3.96	3.97	good	1.52	1.000		922m	South West
GW108832	10BL601316, 10WA114318	Spear	Private	Domestic	Domestic		24/04/2008	6.10			3.36	1.000		927m	South West
GW110654	10BL600671, 10WA114192	Spear	Private	Domestic	Domestic		28/11/2006	7.93	7.93	Good	3.96	1.000		930m	South West
GW111682	10BL163782, 10WA113678	Spear	Private	Domestic	Domestic		01/06/2006	9.00	9.00			0.660		931m	South West
GW106309	10BL163680, 10WA113649	Spear	Private	Domestic	Domestic		02/09/2004	8.85	8.85		5.80	1.000		932m	South West
GW109004	10BL601346, 10WA114323	Bore	Private	Domestic	Domestic		09/07/2008	6.00		Good	4.00	0.500		936m	South West
GW111710	10BL603004, 10WA114565	Spear	Private	Domestic	Domestic		28/11/2010	7.00	7.00	good	5.00	0.500		939m	South West
GW110659	10BL163882, 10WA113701	Spear	Private	Domestic	Domestic		01/01/2004	9.00			4.00	0.500		940m	South West
GW112396	10WA118589	Spear	Private	Domestic	Domestic		11/03/2013	7.00	7.00		4.00	0.500		941m	South West
GW023285	10BL016680, 10WA112834	Bore	Private	Domestic	General Use		01/11/1965	5.70	5.80					946m	South West
GW107053	10BL162715, 10WA113475	Spear	Private	Domestic	Domestic		02/04/2005	9.00	9.00					950m	South West
GW109455	10BL164582, 10WA113814	Spear	Private	Domestic	Domestic		19/02/2005	9.15		Good	6.10	1.000		951m	South West
GW111316	10BL602906, 10BL604791, 10CA117813	Bore	Private	Irrigation, Recreation (groundwater), Test Bore	Irrigation, Recreation (groundwater)		01/03/2010	162.00	162.00	1400	4.00	2.000		952m	North West
GW024319	10BL018628, 10WA112961	Spear	Private	Domestic	General Use		01/08/1966	4.50	4.60					952m	South West
GW106450	10BL164013	Spear	Private	Domestic	Domestic		08/10/2004	2.00	2.00					955m	West
GW106778	10BL163788, 10WA113682	Spear	Private	Domestic	Domestic		29/08/2004	7.63	7.63	Good	4.58	1.000		957m	South West
GW101827	10BL157441, 10WA113156	Bore		Domestic	Domestic		03/03/1999	7.93	7.93	Good	2.44	0.800		957m	South West
GW111117	10BL604102, 10WA114602	Spear	Private	Domestic	Domestic		25/08/2010	8.54	8.54	good	4.88	1.000		960m	South West
GW108441	10BL600981, 10WA114257	Spear	Private	Domestic	Domestic		17/01/2007	8.54	8.54	Good		1.000		964m	South West

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW108534	10BL600971, 10WA114254	Spear	Private	Domestic	Domestic		30/01/2007	7.00	7.00	Good	5.00	0.500		966m	South West
GW104656	10BL161282	Bore	Private	Monitoring Bore	Monitoring Bore		10/07/2002	8.00	8.00	300	7.00			973m	South West
GW106897	10BL164361, 10WA113781	Spear	Private	Domestic	Domestic		11/01/2005	6.00	6.00	Good	4.00	0.500		980m	South West
GW104655	10BL161282	Bore	Private	Monitoring Bore	Monitoring Bore		10/07/2002	8.00	8.00	300	7.00			987m	South West
GW109581	10BL165433, 10WA113976	Spear	Private	Domestic	Domestic		17/08/2005	7.32	7.32	Good	4.27	1.000		987m	South West
GW107317	10BL165370, 10WA113968	Spear	Private	Domestic	Domestic		18/08/2005	7.32	7.32	Good	3.90	1.000		992m	South West
GW104654	10BL161282	Bore	Private	Monitoring Bore	Monitoring Bore		10/07/2002	8.00	8.00	300	7.00			995m	South West
GW100297	10BL154886, 10WA113014	Spear	Private	Domestic	Domestic		10/08/1995	5.00	5.00					995m	South West
GW104653	10BL161282	Bore	Private	Monitoring Bore	Monitoring Bore		10/07/2002	8.00	8.00	334	7.00			998m	South West
GW108573	10BL601408, 10WA114340	Bore	Private	Domestic	Domestic		06/03/2007	7.93	7.93	Good	3.96	1.000		999m	South West
GW106277	10BL163520, 10WA113598	Spear		Domestic	Domestic		09/09/2004	6.50	6.50					1000m	South West
GW104652	10BL161282	Bore	Private	Monitoring Bore	Monitoring Bore		10/07/2002	8.00	8.00	300	6.50			1002m	South
GW104657	10BL161282	Bore	Private	Monitoring Bore	Monitoring Bore		10/07/2002	8.00	8.00	300	6.00			1004m	South
GW106507	10BL164258, 10WA113766	Spear	Private	Domestic	Domestic		15/10/2004	7.00	7.00	Good	4.00	0.500		1009m	South West
GW112389	10WA117556	Spear	Private	Domestic	Domestic		08/03/2013	9.00	9.00		5.00	0.500		1020m	South West
GW016114	10BL008398, 10WA114695	Bore	Private	Recreation (groundwater)	Recreation (groundwater)		01/11/1957	13.70	13.70					1022m	South West
GW107370	10BL165546, 10WA113989	Bore	Private	Domestic	Domestic		25/10/2005	7.00	7.00					1026m	South West
GW107313	10BL165085, 10WA113921	Spear	Private	Domestic	Domestic		18/04/2005	9.15	9.15		6.49	1.000		1035m	South West
GW107628	10BL163906, 10WA113704	Spear	Private	Domestic	Domestic		30/05/2005	7.00	7.00					1037m	South West
GW108870	10BL164936, 10CA114737	Excavation	Private	Irrigation	Irrigation		12/05/2008	5.00						1041m	West
GW023135	10BL016657	Spear	Private	Irrigation	General Use		01/12/1965	7.00	7.00					1051m	South West
GW106826	10BL162520, 10WA113438	Spear	Private	Domestic	Domestic		11/03/2005	6.00	6.00	Good	3.00	0.500		1068m	South West

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW105982	10BL162506, 10WA113437	Spear	Private	Domestic	Domestic		09/07/2004	7.00	7.00	Good	5.00	0.500		1071m	South West
GW110558	10BL603050, 10WA114567	Spear	Private	Domestic	Domestic		10/11/2009	7.00	7.00	Good	5.00	0.500		1080m	South West
GW072968		Spear	Private		Domestic		21/02/1995	8.50	8.50	Good				1082m	South West
GW108597	10BL601369, 10WA114328	Spear	Private	Domestic	Domestic		27/02/2007	8.54	8.54	Good	5.49	1.000		1086m	South West
GW114560	10WA118862	Spear	Private	Domestic	Domestic		23/01/2014	8.85	8.85	Good	5.49	1.000		1089m	South West
GW107720	10BL164767, 10WA113855	Spear	Private	Domestic			04/01/2007							1091m	South West
GW108277	10BL165952, 10WA114066	Bore		Domestic	Domestic		01/01/1993	6.00				21.000		1101m	South West
GW106352	10BL163539, 10WA113605	Spear	Private	Domestic	Domestic		27/09/2004	9.15	9.15		6.41	1.000		1112m	South West
GW107689	10BL164315, 10WA113775	Spear	Private	Domestic	Domestic		20/11/2005	7.00	7.00					1112m	South West
GW111091	10BL601670, 10WA114404	Spear	Private	Domestic	Monitoring Bore		24/08/2007	7.00	7.00					1117m	South West
GW109092	10BL600227, 10BL602308, 10WA114745	Bore	Private	Recreation (groundwater), Test Bore	Recreation (groundwater)		22/07/2008	4.00	4.00	Good	2.00	0.500		1118m	South West
GW107780	10BL165900, 10WA114057	Spear	Private	Domestic	Domestic		08/02/2006	8.54	8.54	Good	5.49	1.000		1118m	South West
GW106891	10BL164384, 10WA113787	Spear	Private	Domestic	Domestic		28/12/2004	6.00	6.00					1137m	South West
GW106899	10BL163996, 10WA113717	Spear	Private	Domestic	Domestic		22/11/2005	9.46	9.46	Good	6.10	1.000		1138m	South West
GW107350	10BL165077, 10WA113918	Spear	Private	Domestic	Domestic		24/09/2005	9.46	9.46		5.80	1.000		1143m	South West
GW111888	10BL601024, 10WA114266	Spear	Private	Domestic	Domestic		17/12/2006	8.80	8.80					1147m	South West
GW108432	10BL600966, 10WA114252	Spear	Private	Domestic	Domestic		17/01/2007	7.93	7.93	Good	4.88	1.000		1175m	South West
GW108631	10BL165236, 10WA113937	Spear	Private	Domestic	Domestic		16/08/2005	7.00	7.00					1187m	South West
GW023191	10BL016920, 10WA112851	Spear	Private	Domestic	General Use			3.60	3.70					1190m	North West

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GW107153	10BL164915, 10WA113887	Spear	Private	Domestic	Domestic		30/05/2005	8.23	8.24		4.88	1.000		1207m	South West
GW110781	10BL601330, 10WA114320	Spear	Private	Domestic	Domestic		17/02/2007	8.54	8.54	Good	5.49	1.000		1218m	South West
GW106873	10BL164550, 10WA113809	Spear	Private	Domestic	Domestic		29/11/2004	7.63	7.63	Good	4.58	1.000		1221m	South West
GW111308	10BL600134, 10WA114108	Spear	Private	Domestic	Domestic		19/03/2008	8.00	8.00					1223m	South West
GW114839	10WA119177	Spear	Private	Domestic	Domestic		11/04/2015	5.00	5.00		15.00	0.500		1226m	South West
GW100209	10BL152038	Bore	Private	Domestic, Stock	Domestic, Stock		16/04/1993	108.00	108.00	8000		0.790		1226m	North
GW111482	10WA102323	Spear	Private	Domestic	Domestic		23/05/2011	7.63	7.63	good	4.27	1.000		1242m	South West
GW109223	10BL164465, 10WA113797	Spear	Private	Domestic	Domestic		18/08/2008	6.00						1249m	South West
GW023194	10BL016604, 10WA108122	Spear	Private	Domestic, General Use	General Use		01/11/1965	4.80	4.90	Good				1262m	North West
GW064827		Bore	Private		Domestic		01/11/1991	7.80						1286m	South West
GW110735	10BL600691, 10WA114197	Bore	Private	Domestic	Domestic		01/01/2006	8.00			2.00	2.500		1286m	North West
GW108295	10BL600614, 10WA114178	Spear	Private	Domestic	Domestic		01/11/2006	8.00	8.00					1286m	West
GW105517	10BL162103, 10WA113348	Bore		Domestic	Domestic		03/11/2003	3.97	3.97		1.22	1.000		1291m	South West
GW107269	10BL163982, 10WA113713	Spear	Private	Domestic	Domestic		16/12/2004	7.50	7.50		2.00	0.500		1293m	South West
GW111790	10BL600843, 10WA114236	Spear	Private	Domestic	Domestic		01/01/2007	6.00	6.00					1304m	North West
GW108439	10BL600888, 10WA114237	Spear	Private	Domestic	Domestic		05/01/2007	8.00	8.00					1304m	West
GW105629	10BL162294, 10WA113397	Spear	Private	Domestic	Domestic		19/11/2003	7.93	7.93		4.27	1.500		1314m	South West
GW111149	10BL601733, 10WA114410	Spear	Private	Domestic	Domestic		31/05/2007	7.00	7.00					1324m	South West
GW108298	10BL600632, 10WA114183	Spear	Private	Domestic	Domestic		20/10/2006	6.00						1325m	South West
GW023451	10BL017145, 10WA112866	Spear	Private	Domestic	General Use			2.80						1345m	South West

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GW108993	10BL602085, 10WA114439	Spear	Private	Domestic	Domestic		08/07/2008	7.93		Good	3.96	1.000		1348m	South West
GW107207	10BL164644, 10WA113826	Spear	Private	Domestic	Domestic		24/05/2005	4.00	4.00			0.500		1349m	South West
GW026464	10BL019292, 10WA112982	Spear	Private	Domestic	General Use			5.10						1362m	South West
GW023423	10BL017148, 10BL162266, 10WA113384	Spear	Private	Domestic, Public/municipl	Domestic		01/02/1966	4.50	4.60	Good				1367m	South West
GW107650	10BL165687, 10WA114021	Spear	Private	Domestic	Domestic		15/11/2005	4.00	4.00	Good	2.00	0.500		1376m	South West
GW106167	10BL163780, 10WA113676	Spear	Private	Domestic	Domestic		28/05/2004	6.00	6.00					1388m	South West
GW108623	10BL600077, 10WA114093	Spear	Private	Domestic	Domestic		07/04/2006	6.00	6.00	Good	2.00	0.500		1408m	South West
GW107744	10BL165926, 10WA114059	Spear	Private	Domestic	Domestic		06/01/2006	4.00	4.00	Good	2.00	0.500		1415m	South West
GW110274	10BL165739, 10WA114036	Bore	Private	Domestic	Domestic		01/01/2006	3.00			1.70			1418m	South West
GW023477	10BL017654, 10WA112925	Spear	Private	Domestic	General Use		01/02/1966	6.40	6.40	Good				1422m	South West
GW105588	10BL162243, 10WA113376	Spear	Private	Domestic	Domestic		01/11/2003	4.00	4.00	Good	2.10	0.500		1426m	South West
GW107857	10BL600084, 10WA114095	Spear	Private	Domestic	Domestic		10/03/2006	7.00	7.00		5.00	0.500		1434m	South West
GW108006	10BL165059, 10WA113910	Spear	Private	Domestic	Domestic		22/08/2005	3.96	3.97		1.22	1.000		1446m	South West
GW111558	10BL600777, 10WA114216	Spear	Private	Domestic	Domestic		31/01/2007	6.00	6.00					1448m	South West
GW106975	10BL163580, 10WA113617	Spear	Private	Domestic	Domestic		02/02/2005	4.00	4.00	Good	2.00	0.500		1451m	South West
GW107540	10BL164093, 10WA113727	Spear	Private	Domestic	Domestic		30/10/2005	7.00	7.00					1452m	South West
GW109045	10BL601662, 10WA114402	Spear	Private	Domestic	Domestic		15/07/2008	7.93		Good	4.27	1.000		1456m	South West
GW107166	10BL165186, 10WA113933	Spear	Private	Domestic	Domestic		14/06/2005	4.00	4.00	Good	2.00	0.500		1457m	South West

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GW109121	10BL602117, 10WA114443	Spear	Private	Domestic	Domestic		25/07/2008	5.80		Good	1.52	1.000		1460m	South West
GW110272	10BL165705, 10WA114026	Spear	Private	Domestic	Domestic		30/10/2005	7.02	7.02	Good	3.96	1.000		1462m	South West
GW110845	10BL601174, 10WA114294	Spear	Private	Domestic	Domestic		06/11/2006	8.54	8.54	Good	5.49	1.000		1465m	South West
GW100025	10BL156607, 10BL165340, 10WA113963	Spear	Private	Domestic, Industrial	Domestic		01/08/1995	6.00	6.00					1471m	South West
GW024062	10BL017515, 10WA112909	Spear	Private	Domestic	General Use			3.60	3.70					1472m	West
GW109015	10BL600717, 10WA109111	Spear	Private	Domestic	Domestic		10/07/2008	6.10		Good	4.97	0.500		1482m	West
GW106587	10BL163532, 10WA113602	Spear	Private	Domestic	Domestic		11/10/2004	4.00	4.00	Good	2.00	0.500		1487m	South West
GW101638	10BL157837, 10WA113182	Bore		Domestic	Domestic		19/12/1996	7.63	7.63	Good				1487m	South West
GW072161	10BL153838	Bore	Private	Recreation (groundwater)	Recreation (groundwater)		24/02/1994	90.50	90.50	1600	14.00	7.700		1494m	North
GW108404	10BL600697, 10WA114199	Spear	Private	Domestic	Domestic		01/12/2006	7.63	7.63	Good	1.52	1.000		1499m	South West
GW110868	10BL603653, 10WA114594	Spear	Private	Domestic	Domestic		14/04/2010	6.00	6.00	Good	2.00	0.500		1502m	South West
GW107890	10BL165994, 10WA114075	Spear	Private	Domestic	Domestic		11/02/2006	5.00	5.00		2.00	0.500		1503m	South West
GW109934	10BL602846, 10WA114545	Bore	Private	Domestic	Domestic		18/12/2008	6.00	6.00	Good	3.00	0.500		1513m	South West
GW103950	10BL156624	Bore		Test Bore	Test Bore		19/04/1995	21.00	21.00	10800				1517m	East
GW103946	10BL156624	Bore		Test Bore	Test Bore		19/04/1995	17.00	17.00	1400				1517m	East
GW103949	10BL156624	Bore		Test Bore	Test Bore		19/04/1995	21.00	21.00	12900				1517m	East
GW103951	10BL156624	Bore		Test Bore	Test Bore		21/06/1995	149.00	149.00	560				1517m	East
GW103944	10BL156624	Bore		Test Bore	Test Bore		19/04/1995	18.00	18.00	7600				1517m	East
GW103945	10BL156624	Bore		Test Bore	Test Bore		19/04/1995	21.00	21.00	7700				1517m	East
GW103941	10BL156624	Bore		Test Bore	Test Bore		18/04/1995	21.00	21.00	200				1517m	East
GW103948	10BL156624	Bore		Test Bore	Test Bore		19/04/1995	18.00	18.00	8300				1517m	East
GW027664	10BL020771	Bore	Private	Recreation (groundwater)	Irrigation		01/06/1966	6.00	6.10					1517m	North West

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GW103942	10BL156624	Bore		Test Bore	Test Bore		19/04/1995	12.00	12.00	5300				1517m	East
GW103943	10BL156624	Bore		Test Bore	Test Bore		18/04/1995	14.00	14.00	8000				1517m	East
GW103947	10BL156624	Bore		Test Bore	Test Bore		19/05/1995	18.00	18.00	9500				1517m	East
GW109645	10BL602446, 10WA114513	Spear	Private	Domestic	Domestic		12/05/2008	8.54	8.54	Good	5.18	1.000		1524m	South West
GW023304	10BL016695, 10WA112837	Spear	Private	Domestic	General Use		01/11/1965	4.20	4.30	Good				1531m	South West
GW016108	10BL008343, 10WA112792	Spear	Private	Domestic	General Use			7.60	7.60					1531m	South West
GW109963	10BL601004, 10WA114261	Spear	Private	Domestic	Domestic		28/11/2006	8.00	8.00					1548m	North West
GW108406	10BL600707, 10WA114202	Spear	Private	Domestic	Domestic		28/11/2006	8.00	8.00					1562m	North West
GW109964	10BL601003, 10WA114260	Spear	Private	Domestic	Domestic		28/11/2006	8.00	8.00					1569m	North West
GW108588	10BL601050, 10WA114273	Spear	Private	Domestic	Domestic		03/02/2007	8.00	8.00					1571m	North West
GW023583	10BL017517, 10WA112911	Spear	Private	Domestic	General Use			8.20	8.20	Potable				1571m	South West
GW106206	10BL163318, 10WA113559	Spear	Private	Domestic	Domestic		11/08/2004	5.18	5.19		2.13	1.000		1571m	South West
GW109965	10BL601646, 10WA114397	Bore	Private	Domestic	Domestic		28/11/2006	8.00	8.00					1582m	North West
GW108495	10BL600787, 10WA114220	Spear	Private	Domestic	Domestic		15/02/2007	9.46	9.46	Good	5.49	1.000		1602m	South West
GW101328	10BL158406, 10WA113228	Spear	Private	Domestic	Domestic		02/02/1998	7.62	7.62	Good	5.18	1.000		1603m	South West
GW107531	10BL163207, 10WA114719	Bore		Industrial	Industrial		19/10/2005	14.00	14.00	Good	2.00	2.000		1620m	South West
GW107236	10BL165210, 10WA113936	Bore		Domestic	Domestic		13/08/1995	8.00			5.00	60.000		1628m	South West
GW109966	10BL601239, 10WA114306	Spear	Private	Domestic	Domestic		17/03/2009	3.00	3.00					1635m	North West
GW107148	10BL164995, 10WA113902	Spear	Private	Domestic	Domestic		25/05/2005	5.80	5.80		1.52	1.000		1646m	South West
GW114745	10BL605632	Bore	Private	Monitoring Bore	Monitoring Bore	BRANO PTY LTD	17/10/2014	13.95	13.95					1648m	North West
GW114744	10BL605632	Bore	Private	Monitoring Bore	Monitoring Bore	BRANO PTY LTD	17/10/2014	17.00	17.00					1653m	North West

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GW107344	10BL165389, 10WA113970	Spear	Private	Domestic	Domestic		08/08/2005	4.00	4.00	Good	2.00	0.500		1661m	South West
GW105153	10BL157074, 10WA113109	Bore	Private	Domestic	Domestic		13/09/1995	5.49	5.49	Good	5.49	1.000		1662m	South West
GW105880	10BL162677, 10WA113471	Bore		Domestic			09/05/2005							1663m	South
GW024109	10BL017755, 10WA112930	Spear	Private	Domestic	General Use		01/03/1966	2.10	2.10					1672m	North West
GW023310	10BL016882, 10WA112850	Bore	Private	Domestic	General Use		01/01/1966	3.60	3.70					1677m	South West
GW101137	10BL158207, 10WA113204	Spear	Private	Domestic	Domestic		02/01/1998	6.70	6.71	Good	3.96	0.750		1681m	South West
GW106889	10BL164401, 10WA113788	Spear	Private	Domestic	Domestic		29/12/2005	7.93	7.93	Good	1.88	1.000		1685m	South West
GW108590	10BL601169, 10WA109155	Spear	Private	Domestic	Domestic		13/03/2007	3.96	3.97	Good	2.13	5.000		1692m	South West
GW105158	10BL162173, 10BL163150	Bore	Private	Domestic, Industrial, Test Bore	Domestic, Industrial		21/10/2003	4.58	4.58		1.83	1.000		1697m	South West
GW109419	10BL602238, 10WA114469	Spear	Private	Domestic	Domestic		14/10/2008	7.93		Good	4.27	1.000		1708m	South West
GW013657	10BL009135, 10WA112801	Spear	Private	Domestic	General Use			7.60	7.60					1718m	South West
GW107552	10BL164240, 10WA113762	Spear	Private	Domestic	Domestic		27/10/2004	9.15	9.15	Good	5.80	1.000		1721m	South West
GW106360	10BL164059, 10WA113721	Bore		Domestic			22/08/2005							1729m	South West
GW111782	10BL600979, 10WA114255	Spear	Private	Domestic	Domestic		01/01/2006	8.00	8.00		2.50	1.000		1742m	South West
GW111769	10BL165079, 10WA113919	Spear	Private	Domestic	Domestic		01/08/2005	7.60	7.60	good	4.58	1.000		1745m	South West
GW107349	10BL165064, 10WA113913	Spear	Private	Domestic	Domestic		02/09/2005	7.32	7.32	Good	3.96	1.000		1748m	South West
GW108300	10BL600645, 10WA114188	Spear	Private	Domestic	Domestic		30/10/2006	7.32	7.32		3.96	1.000		1754m	South West
GW106986	10BL163124, 10WA113528	Spear	Private	Domestic	Domestic		04/06/2004	7.01	7.02	Good	3.96	1.000		1768m	South West
GW109666	10BL602665, 10WA114530	Spear	Private	Domestic	Domestic		09/09/2008	10.68	10.68	Good	6.10	1.000		1783m	South

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GW111590	10BL600750, 10WA114212	Spear	Private	Domestic	Domestic		01/01/2006	7.00	7.00					1786m	South West
GW106128	10BL162245, 10WA113377	Spear	Private	Domestic	Domestic		22/03/2004	7.00	7.00	Good	5.00	0.500		1790m	South West
GW105975	10BL163247, 10WA113543	Spear	Private	Domestic	Domestic		08/06/2004	8.23	8.24		5.18	1.000		1794m	South West
GW112342	10BL165795, 10WA114043	Spear	Private	Domestic	Domestic		29/11/2005	9.15	9.15		5.19	1.000		1796m	South West
GW100473	10BL157884, 10WA113184	Spear	Private	Domestic	Domestic		25/03/1997	6.71	6.71	Good		1.000		1797m	South West
GW107662	10BL165792, 10WA114041	Spear	Private	Domestic	Domestic		08/12/2005	6.00	6.00	Good	4.00	0.500		1813m	South West
GW111713	10BL603088, 10WA114568	Spear	Private	Domestic	Domestic		28/05/2009	7.93	7.93	good	4.27	1.000		1816m	South West
GW108584	10BL600833, 10WA114233	Spear	Private	Domestic	Domestic		23/01/2007	5.80	5.80	Good	2.44	1.000		1830m	South West
GW106851	10BL164416, 10WA113790	Spear	Private	Domestic	Domestic		01/12/2004	3.50	3.50					1831m	South
GW111227	10BL604151, 10WA114604	Spear	Private	Domestic	Domestic		30/08/2010	8.54	8.54	good	4.80	1.000		1831m	South West
GW027569	10BL021053, 10BL603143, 10WA114571	Spear	School	Domestic, Recreation (groundwater)	Domestic		08/12/2006	8.24	8.24	Good	3.60	1.000		1837m	South West
GW102226	10BL159118, 10WA113277	Spear	Private	Domestic	Domestic		27/03/1999	7.63	7.63	Good	4.88	1.000		1839m	South West
GW025565	10BL016297, 10WA112805	(Unknown)	Private	Domestic	General Use		01/11/1965	5.40	5.50					1843m	South West
GW110908	10BL603567	Well	Private	Monitoring Bore	Monitoring Bore		19/01/2010	6.00	6.00		4.00			1848m	East
GW111666	10WA117351	Spear	Private	Domestic	Domestic		16/01/2012	7.63	7.63	good	4.58	1.000		1850m	South West
GW106474	10BL164120, 10WA113730	Spear	Private	Domestic	Domestic		18/10/2004	7.63	7.63	Good	4.57	1.000		1851m	South West
GW107105	10BL163404, 10WA113576	Spear	Private	Domestic	Domestic		21/06/2004	7.26	7.26	Good	3.96	1.000		1871m	South West
GW107973	10BL600198, 10WA114123	Spear	Private	Domestic	Domestic		20/04/2007	7.00	7.00					1880m	South West
GW107542	10BL165724, 10WA114032	Spear	Private	Domestic	Domestic		11/11/2005	7.32	7.32	Good	4.37	1.000		1888m	South West

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW023837	10BL017311, 10WA112887	Spear	Private	Domestic	General Use		01/01/1966	5.10	5.20	Good				1889m	South West
GW110907	10BL603567	Well	Private	Monitoring Bore	Monitoring Bore		19/01/2010	5.80	5.80		3.80			1889m	East
GW110906	10BL603567	Well	Private	Monitoring Bore	Monitoring Bore		19/01/2010	5.80	5.80		3.50			1899m	East
GW108937	10BL601875, 10WA114419	Spear	Private	Domestic	Domestic		19/06/2008	7.32		Good	3.96	1.000		1900m	South West
GW108796	10BL601758, 10WA114412	Spear	Private	Domestic	Domestic		04/06/2007	7.63	7.63	Good	4.27	1.000		1903m	South West
GW113045	10BL602385, 10WA114502	Spear	Private	Domestic	Domestic		01/01/2008	8.00	8.00	Salty	7.00	0.500		1913m	South West
GW110898	10BL603948, 10WA114600	Spear	Private	Domestic	Domestic		22/05/2010	8.45	8.45	good	5.49	1.000		1918m	South West
GW109268	10BL164861, 10WA113875	Spear	Private	Domestic	Domestic		26/08/2008	6.50						1921m	South West
GW111037	10BL601593, 10WA114383	Spear	Private	Domestic	Domestic		30/05/2009	6.00	6.00					1928m	South West
GW106946	10BL164802, 10WA113862	Spear	Private	Domestic	Domestic		06/04/2005	6.00	6.00					1928m	South West
GW111172	10BL165178, 10WA113931	Bore	Private	Domestic	Domestic		01/01/2005	10.00	10.00					1930m	South West
GW110097	10BL163711, 10WA113658	Spear	Private	Domestic	Domestic		18/09/2004	6.71	6.71	Good	3.05	1.000		1937m	South West
GW111443	10BL600798, 10WA114225	Spear	Private	Domestic	Domestic		12/02/2007	9.15	9.15	good	9.15	1.000		1938m	South West
GW108982	10BL602092, 10WA114440	Spear	Private	Domestic	Domestic		30/06/2008	6.00		Good	4.00	0.500		1946m	South West
GW107883	10BL165979, 10WA114073	Spear	Private	Domestic	Domestic		06/02/2006	7.00	7.00		4.00	0.500		1952m	South West
GW023257	10BL016739	Spear	Private	Irrigation	Irrigation		01/11/1965	5.40	5.50	Good				1955m	South West
GW106563	10BL164243, 10WA113763	Spear	Private	Domestic	Domestic		15/11/2004	6.71	6.71		3.66	1.000		1968m	South West
GW107026	10BL163215, 10WA113540	Spear	Private	Domestic	Domestic		01/03/2005	9.76	9.76	Good	6.10	1.000		1976m	South
GW027570	10BL021054, 10WA114767	(Unknown)	Private	Recreation (groundwater)	Irrigation		01/07/1967	15.20	15.20					1980m	South West
GW110911	10BL603566	Well	Private	Monitoring Bore	Monitoring Bore		19/01/2010	6.00	6.00		3.20			1982m	East

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW109314	10BL602492, 10WA114519	Spear	Private	Domestic	Domestic		09/09/2008	9.15		Good	5.80	1.000		1983m	South West

Borehole Data Source : NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corporation for all bores prefixed with GW. All other bores © Commonwealth of Australia (Bureau of Meteorology) 2015. Creative Commons 3.0 © Commonwealth of Australia http://creativecommons.org/licenses/by/3.0/au/deed.en

Hydrogeology & Groundwater

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Driller's Logs

Drill log data relevant to the boreholes within the dataset buffer:

Groundwater No	Drillers Log	Distance	Direction
GW023455	0.00m-0.91m Sand 0.91m-4.87m Sand White Water Supply	0m	Onsite
GW109028	0.00m-0.30m TOPSOIL 0.30m-6.50m YELLOW SAND 6.50m-8.00m GREY SAND	0m	Onsite
GW101797	0.00m-5.79m UNCONSOLIDATED SAND	41m	East
GW107210	0.00m-0.30m topsoil 0.30m-4.50m sand, yellow 4.50m-6.00m sand, white and shells	42m	West
GW105991	0.00m-0.30m topsoil 0.30m-3.20m sand, yellow 3.20m-6.00m sand, grey with some shells	48m	North
GW108702	0.00m-0.30m topsoil 0.30m-3.30m sand, yellow 3.30m-6.00m sand, grey and shells	62m	North West
GW111939	0.00m-6.00m SAND	64m	North West
GW102799	0.00m-7.63m UNCONSOLIDATED ALL SANDS	65m	West
GW101163	0.00m-5.79m UNCONSOLIDATED. ALL CLEAN SAND WITH SMALL SEA SHELLS.	66m	East
GW109654	0.00m-8.23m UNCONSOLIDATED ALL SANDS	69m	West
GW102218	0.00m-6.71m Unconsolidated Sands, some sea shells	71m	North West
GW102693	0.00m-7.63m SANDS UNCONSOLIDATED	71m	North West
GW101022	0.00m-6.10m UNCONSOLIDATED ALL SANDS	72m	East
GW107052	0.00m-5.79m Sand, unconsolidated	73m	North East
GW108571	0.00m-8.85m Sand, unconsolidated	74m	South
GW108239	0.00m-7.63m sand, decomposed	85m	South West
GW100685	0.00m-6.10m SAND	90m	North East
GW105774	0.00m-7.32m sand, unconsolidated with small sea shells	95m	West
GW108582	0.00m-8.54m Sand, unconsolidated	98m	South West
GW024202	0.00m-0.91m Sand Grey 0.91m-6.70m Sand White Water Supply	100m	South West
GW108179	0.00m-9.76m sand	101m	South
GW105674	0.00m-7.02m sand, unconsolidated with shell	107m	West
GW106557	0.00m-6.10m sand, unconsolidated	110m	North East
GW106014	0.00m-7.32m sand, with small sea shells	129m	North West

Groundwater No	Drillers Log	Distance	Direction
GW106940	0.00m-0.30m Topsoil 0.30m-3.50m Sand, brown 3.50m-6.00m Sand, grey	133m	North East
GW024203	0.00m-2.13m Sand Grey 2.13m-5.48m Sand Light Grey Water Supply	151m	West
GW108795	0.00m-6.10m sand	170m	North East
GW110670	0.00m-5.79m UNCONSOLIDATED ALL SANDS	170m	North East
GW106799	0.00m-6.00m sand	176m	West
GW106712	0.00m-0.30m topsoil 0.30m-4.00m sand, yellow 4.00m-7.00m sand, grey with shells	183m	West
GW023208	0.00m-3.04m Sand Black 3.04m-5.48m Mud Black Water Supply	196m	West
GW072785	0.00m-7.60m Unconsolidated Sand With Small Sea Shells	203m	South West
GW104867	0.00m-8.85m UNCONSOLIDATED ALL SAND	203m	South West
GW111540	0.00m-8.54m UNCONSOLIDATED ALL SAND	208m	East
GW106271	0.00m-6.10m sand	215m	West
GW023276	0.00m-0.30m Made Ground 0.30m-4.57m Sand Dirty 4.57m-6.09m Wood Decomposed Sand 6.09m-7.62m Sand Dirty 7.62m-8.83m Mud Marine Fossils:shell Fragments Water Supply	224m	North West
GW023524	0.00m-6.09m Sand Water Supply	225m	West
GW110133	0.00m-8.54m UNCONSOLIDATED ALL SANDS	243m	East
GW107977	0.00m-5.79m SAND	246m	West
GW024379	0.00m-8.22m Sand White Water Supply	268m	South East
GW013505	0.00m-9.14m Sand Water Supply	276m	South
GW072283	0.00m-7.32m Unconsolidated Sand	289m	West
GW023684	0.00m-7.92m Sand White Water Supply	297m	South
GW100740	0.00m-8.23m UNCONSOLIDATED WITH SMALL SEA SHELLS	301m	South West
GW110098	0.00m-8.23m UNCONSOLIDATED ALL SANDS	317m	South West
GW103152	0.00m-8.23m UNCONSOLIDATED ALL SANDS	320m	South West
GW111121	0.00m-10.68m UNCONSOLIDATED ALL SANDS	326m	South
GW105565	0.00m-7.63m UNCONSOLIDATED ALL SANDS	332m	West
GW111139	0.00m-10.98m UNCONSOLIDATED ALL SANDS	339m	South
GW106720	0.00m-6.00m sand	362m	South West
GW107605	0.00m-8.54m Sand, unconsolidated	370m	South West
GW110441	0.00m-8.54m UNCONSOLIDATED ALL SANDS	377m	South West
GW109932	0.00m-7.32m UNCONSOLIDATED ALL SANDS	401m	South West
GW108744	0.00m-9.15m sand	433m	South West
GW108713	0.00m-9.15m sand	447m	South West

Groundwater No	Drillers Log	Distance	Direction
GW108547	0.00m-7.01m Sand, unconsolidated	449m	South West
GW107516	0.00m-8.00m sand	461m	South West
GW023291	0.00m-3.35m Sand 3.35m-5.18m Sand Pete Water Supply 5.18m-7.62m Sand Water Supply	462m	South West
GW024064	0.00m-9.14m Sand White Water Supply	473m	South
GW110445	0.00m-6.00m ALL SAND	477m	South West
GW108721	0.00m-8.54m sand	486m	South West
GW107356	0.00m-0.30m topsoil 0.30m-4.50m sand, yellow 4.50m-6.00m sand, grey	488m	South West
GW105768	0.00m-7.01m sand, unconsulidated	492m	South West
GW106659	0.00m-7.63m sand, unconsolidated	498m	South West
GW107333	0.00m-10.37m Sand, unconsolidated	511m	South
GW109926	0.00m-0.30m TOPSOIL 0.30m-6.00m YELLOW SAND 6.00m-9.00m GREY SAND AND SHELLS	542m	South West
GW111311	0.00m-9.15m UNCONSOLIDATED ALL SAND	544m	South West
GW072405	0.00m-0.30m GARDEN LOAM 0.30m-8.00m SAND	546m	South
GW110554	0.00m-0.30m TOPSOIL 0.30m-6.30m SAND YELLOW 6.30m-9.00m SAND, GREY,SMALL SHALES	550m	South
GW106631	0.00m-8.85m sand, unconsolidated	551m	South West
GW107507	0.00m-0.30m topsoil 0.30m-6.30m sand, yellow 6.30m-9.00m sand, white	573m	South
GW107626	0.00m-0.30m topsoil 0.30m-6.30m sand, yellow 6.30m-9.00m sand, white	586m	South
GW105995	0.00m-1.52m clay, land fill 1.53m-4.58m sand, unconsolidated	597m	West
GW108539	0.00m-0.30m Topsoil 0.30m-4.50m Sand, yellow 4.50m-7.00m Sand, grey	600m	South West
GW024585	0.00m-0.91m Sand Grey 0.91m-7.01m Sand White Water Supply	603m	South West
GW106067	0.00m-10.06m sand, unconsolidated	604m	South
GW110844	0.00m-5.49m UNCONSOLIDATED ALL SAND	613m	South West
GW107346	0.00m-9.76m Sand, unconsolidated	624m	South West
GW106425	0.00m-7.00m sand	625m	South West
GW108252	0.00m-9.15m sand, unconsolidated	638m	South West
GW108171	0.00m-9.00m sand	655m	South
GW100965	0.00m-8.23m UNCONSOLIDATED ALL SANDS	656m	South West
GW110917	0.00m-8.54m UNCONSOLIDATED ALL SAND.	661m	South West
GW107302	0.00m-6.00m sand	667m	South West

Groundwater No	Drillers Log	Distance	Direction
GW107318	0.00m-7.63m Sand, unconsolidated	669m	South West
GW101032	0.00m-7.32m UNCONSOLIDATED. ALL SAND WITH SMALL SEA SHELLS.	671m	South West
GW107306	0.00m-6.00m sand	679m	South West
GW111224	0.00m-0.30m TOPSOIL 0.30m-4.30m YELLOW SAND 4.30m-6.00m GREY SAND	679m	West
GW105725	0.00m-8.85m sand, unconsolidated with small sea shells	681m	South West
GW106274	0.00m-8.23m sand	694m	South West
GW108434	0.00m-8.54m Sand, unconsolidated	697m	South West
GW107121	0.00m-5.00m Sand	698m	South West
GW107541	0.00m-6.00m sand	715m	South West
GW110897	0.00m-8.54m UNCONSOLIDATE ALL SAND	719m	South West
GW106982	0.00m-5.00m ALL SAND	722m	West
GW108599	0.00m-12.00m sand	744m	South West
GW101765	0.00m-8.00m Sand	747m	South West
GW108096	0.00m-7.32m sand	747m	South West
GW107972	0.00m-7.00m sand	756m	South West
GW104901	0.00m-7.63m UNCONSOLIDATED ALL SANDS	758m	South
GW108578	0.00m-6.00m Sand	761m	South West
GW100444	0.00m-5.49m UNCONSOLIDATED, ALL SAND	772m	West
GW107511	0.00m-8.23m Sand, unconsolidated	780m	South West
GW105550	0.00m-8.85m UNCONSOLIDATED ALL SANDS/SHELLS	781m	South West
GW108454	0.00m-9.46m Sand, unconsolidated	788m	South West
GW017475	0.00m-7.62m Sand Water Supply	798m	South West
GW108717	0.00m-5.18m sand	798m	West
GW108625	0.00m-9.46m sand	803m	South West
GW107442	0.00m-9.15m Sand, unconsolidated	807m	South West
GW109697	0.00m-6.10m UNCONSOLIDATED ALL SANDS	809m	South West
GW101818	0.00m-5.50m SAND	812m	South West
GW107425	0.00m-0.30m topsoil 0.30m-4.20m sand, yellow 4.20m-9.00m sand, white	814m	South West
GW026375	0.00m-7.01m Sand	816m	South
GW101222	0.00m-7.78m Unconsolidated - all sand with sea shells	829m	South West
GW108488	0.00m-9.26m Sand, unconsolidated	832m	South West
GW108411	0.00m-8.54m Sand, unconsolidated	837m	South West
GW111296	0.00m-5.49m UNCONSOLIDATED ALL SAND	838m	South West

Groundwater No	Drillers Log	Distance	Direction
GW110440	0.00m-0.30m TOPSOIL 0.30m-7.00m SAND WHITE 7.00m-9.00m SAND GREY WITH SHELLS	847m	South West
GW110220	0.00m-6.00m ALL SAND	856m	South West
GW111741	0.00m-11.59m UNCONSOLIDATE ALL SAND	862m	South West
GW107746	0.00m-8.00m sand	865m	South West
GW101756	0.00m-6.10m Unconsolidated Sand	866m	South West
GW111498	0.00m-11.59m UNCONSOLIDADTED ALL SAND	873m	South West
GW107985	0.00m-5.49m sand	874m	South West
GW110656	0.00m-7.93m UNCONSOLIDATE ALL SANDS	880m	South West
GW101433	0.00m-5.49m SAND, UNCONSOLIDATED, WITH SEA SHELLS	889m	South West
GW110528	0.00m-6.71m UNCONSOLIDATED ALL SANDS	906m	South West
GW106233	0.00m-5.00m sand	910m	South West
GW107870	0.00m-4.27m sand	914m	South West
GW111743	0.00m-3.96m UNCONSOLIDATED ALL SAND	922m	South West
GW110654	0.00m-7.93m UNCONSOLIDATED ALL SANDS	930m	South West
GW106309	0.00m-8.85m sand	932m	South West
GW111710	0.00m-0.30m TOPSOIL 0.30m-7.00m SAND YELLOW	939m	South West
GW112396	0.00m-0.20m TOPSOIL 0.20m-3.00m SAND YELLOW 3.00m-7.00m SAND WHITE	941m	South West
GW023285	0.00m-5.79m Sand Water Supply	946m	South West
GW107053	0.00m-9.00m sand	950m	South West
GW024319	0.00m-3.04m Sand 3.04m-4.57m Loam	952m	South West
GW111316	0.00m-37.00m SAND 37.00m-45.00m SANDSTONE FRACTURED 45.00m-162.00m SANDSTONE	952m	North West
GW106450	0.00m-0.30m topsoil 0.30m-1.20m clay, brown & sandstone fill 1.20m-2.00m sandstone, fill	955m	West
GW101827	0.00m-7.93m UNCONSOLIDATED SAND WITH SMALL SEA SHELLS	957m	South West
GW106778	0.00m-7.63m sand, unconsolidated	957m	South West
GW111117	0.00m-8.54m UNCONSOLIDATED ALL SANDS	960m	South West
GW108441	0.00m-8.54m Sand, unconsolidated	964m	South West
GW108534	0.00m-0.30m Topsoil 0.30m-5.40m Sand, yellow 5.40m-7.00m Sand, white	966m	South West
GW104656	0.00m-8.00m LT BROWN SAND MED. FINE GRAINED	973m	South West
GW106897	0.00m-0.30m Topsoil 0.30m-4.00m Sand, yellow 4.00m-6.00m Sand, yellow, with small shells	980m	South West

Groundwater No	Drillers Log	Distance	Direction
GW104655	0.00m-8.00m LT. BROWN SAND,MED. FINE GRAINED	987m	South West
GW109581	0.00m-7.32m UNCONSOLIDATED ALL SANDS	987m	South West
GW107317	0.00m-7.32m Sand, unconsolidated	992m	South West
GW100297	0.00m-5.00m SAND	995m	South West
GW104654	0.00m-8.00m LIGHT BROWN SAND,MEDIUM FINE GRAINED	995m	South West
GW104653	0.00m-8.00m LIGHT BROWN FINE MEDIUM GRAINED SAND	998m	South West
GW108573	0.00m-7.93m sand	999m	South West
GW106277	0.00m-6.50m sand	1000m	South West
GW104652	0.00m-8.00m LIGHT BROWN,SAND, MED FINE GRAINED	1002m	South
GW104657	0.00m-8.00m SAND LT BROWN MEDIUM GRAINED	1004m	South
GW106507	0.00m-0.30m topsoil 0.30m-2.50m sand, yellow 2.50m-3.90m sand, brown 3.90m-7.00m sand, white	1009m	South West
GW112389	0.00m-0.30m TOPSOIL 0.30m-3.30m SAND LIGHT BROWN 3.30m-7.00m SAND YELLOW 7.00m-9.00m SAND WHITE	1020m	South West
GW016114	0.00m-0.60m Made Ground Sand 0.60m-1.82m Sand Humus 1.82m-3.65m Sand Peaty 3.65m-6.09m Sand Muddy Fossils:shell Fragments 6.09m-7.31m Sand Fossils:shell Fragments 7.31m-9.44m Sand 9.44m-10.97m Clay Grey 10.97m-12.19m Sand White 12.19m-12.80m Sand Clay 12.80m-13.71m Clay Puggy	1022m	South West
GW107370	0.00m-7.00m sand	1026m	South West
GW107313	0.00m-9.15m Sand, unconsolidated	1035m	South West
GW107628	0.00m-7.00m sand	1037m	South West
GW023135	0.00m-7.01m Sand Water Supply	1051m	South West
GW106826	0.00m-0.30m topsoil 0.30m-4.00m sand, yellow 4.00m-6.00m sand, yellow and shells	1068m	South West
GW105982	0.00m-0.30m topsoil 0.30m-4.00m sand, yellow 4.00m-7.00m sand, light brown	1071m	South West
GW110558	0.00m-0.50m TOPSOIL 0.50m-5.50m YELLOW SAND 5.50m-7.00m SAND GREY	1080m	South West
GW072968	0.00m-8.54m Unconsoldated Sand	1082m	South West
GW108597	0.00m-8.54m sand,	1086m	South West
GW114560	0.00m-8.85m UNCONSOLIDATED ALL SANDS.	1089m	South West
GW106352	0.00m-9.15m sand	1112m	South West
GW107689	0.00m-7.00m sand	1112m	South West
GW111091	0.00m-7.00m ALL SAND	1117m	South West
GW107780	0.00m-8.54m Sand, unconsolidated	1118m	South West

Groundwater No	Drillers Log	Distance	Direction
GW109092	0.00m-0.30m TOPSOIL 0.30m-2.50m YELLOW SAND 2.50m-4.00m BROWN SAND	1118m	South West
GW106891	0.00m-6.00m Sand	1137m	South West
GW106899	0.00m-9.46m Sand, unconsolidated	1138m	South West
GW107350	0.00m-9.46m Sand, unconsolidated	1143m	South West
GW108432	0.00m-7.93m Sand, unconsolidated	1175m	South West
GW108631	0.00m-7.00m sand	1187m	South West
GW023191	0.00m-3.65m Sand Water Supply	1190m	North West
GW107153	0.00m-8.23m sand	1207m	South West
GW110781	0.00m-8.54m UNCONSOLIDATED ALL SANDS	1218m	South West
GW106873	0.00m-7.63m Sand, unconsolidated	1221m	South West
GW100209	0.00m-31.00m FINE WHITE SANDTONE 31.00m-38.00m GREY SHALE 38.00m-45.00m GREY SHALE & COARSE GREY SANDSTONE 45.00m-73.00m COARSE GREY SANDSTONE 73.00m-82.00m COARSE GREY SANDSTONE & GREY SHALE 82.00m-93.00m FINE GREY SANDSTONE 93.00m-102.00m MED GRAIN SANDSTONE 102.00m-104.00m COARSE GREY SANDSTONE 104.00m-108.00m FINE GREY SANDSTONE	1226m	North
GW114839	0.00m-2.00m SAND BROWN 2.00m-5.00m SAND GREY	1226m	South West
GW111482	0.00m-7.63m UNCONSOLIDATED ALL SAND	1242m	South West
GW023194	0.00m-0.91m Sand 0.91m-4.87m Sand White Water Supply	1262m	North West
GW108295	0.00m-8.00m sand	1286m	West
GW105517	0.00m-3.96m UNCONSOLIDATED ALL SANDS	1291m	South West
GW107269	0.00m-1.40m fill, rocks bricks 1.40m-4.00m sand, brown 4.00m-6.00m sand, grey silty 6.00m-7.50m clay, grey	1293m	South West
GW108439	0.00m-8.00m Sand	1304m	West
GW111790	0.00m-6.00m SAND	1304m	North West
GW105629	0.00m-7.93m sand, unconsolidated with sea shells	1314m	South West
GW111149	0.00m-7.00m ALL SAND	1324m	South West
GW107207	0.00m-0.30m topsoil 0.30m-2.50m sand, brown 2.50m-4.00m sand, grey	1349m	South West
GW023423	0.00m-0.91m Made Ground 0.91m-2.13m Sand Red 2.13m-4.57m Sand White Water Supply	1367m	South West
GW107650	0.00m-0.30m topsoil 0.30m-2.50m sand, yellow 2.50m-4.00m sand, grey	1376m	South West
GW106167	0.00m-6.00m sand	1388m	South West
GW108623	0.00m-0.30m topsoil 0.30m-2.60m sand, yellow 2.60m-3.40m sand, silty grey 3.40m-6.00m sand, yellow	1408m	South West

Groundwater No	Drillers Log	Distance	Direction
GW107744	0.00m-0.30m topsoil 0.30m-1.80m sand, dark brown 1.80m-4.00m sand, light brown	1415m	South West
GW023477	0.00m-1.82m Sand Grey 1.82m-6.40m Sand White Water Supply	1422m	South West
GW105588	0.00m-0.30m topsoil 0.30m-3.20m sand, yellow 3.20m-4.00m sand, yellow with shells	1426m	South West
GW107857	0.00m-0.30m topsoil 0.30m-7.00m sand, yellow	1434m	South West
GW108006	0.00m-3.96m sand	1446m	South West
GW111558	0.00m-6.00m ALL SAND	1448m	South West
GW106975	0.00m-0.30m Topsoil 0.30m-2.40m Sand, brown, Silty 2.40m-4.00m Sand, yellow	1451m	South West
GW107540	0.00m-7.00m sand	1452m	South West
GW107166	0.00m-0.30m topsoil 0.30m-3.00m sand, brown 3.00m-4.00m sand, grey	1457m	South West
GW110272	0.00m-7.01m UNCONSOLIDATE ALL SAND	1462m	South West
GW110845	0.00m-8.54m UNCONSOLIDATED ALL SAND	1465m	South West
GW100025	0.00m-6.00m SAND	1471m	South West
GW024062	0.00m-1.82m Sand Wet Nominal 0.00m-1.82m Clay Wet Nominal Heavy Nominal 1.82m-3.65m Clay Very Sandy Water Supply	1472m	West
GW101638	0.00m-7.63m Unconsolidated Sand	1487m	South West
GW106587	0.00m-0.30m topsoil 0.30m-2.50m sand, light brown 2.50m-4.00m sand, grey	1487m	South West
GW072161	0.00m-16.00m SANDY, MARINE CLAYS 16.00m-18.00m SANDSTONE (WEATHERED) 18.00m-20.50m SANDY CLAY BAND 20.50m-28.50m SANDSTONE, SILT BANDS 28.50m-31.00m WHITE SANDSTONE 31.00m-32.50m MEDIUM / LARGE SANDSTONE 32.50m-35.50m SANDSTONE, CLAY BANDS 35.50m-68.00m FINE / MEDIUM WHITE SANDSTONE 68.00m-71.00m SHALE BANDS 71.00m-72.00m MEDIUM / LARGE BANDS CLAY SANDSTONE 72.00m-89.00m WHITE SANDSTONE 89.00m-90.50m SHALE BANDS & GREY SANDSTONE	1494m	North
GW108404	0.00m-7.63m Sand, unconsolidated	1499m	South West
GW110868	0.00m-0.30m TOPSOIL 0.30m-5.00m SAND YELLOW 5.00m-6.00m SAND GREY	1502m	South West
GW107890	0.00m-0.30m topsoil 0.30m-3.50m sand, yellow 3.50m-5.00m sand, grey	1503m	South West
GW109934	0.00m-0.30m TOPSOIL 0.30m-4.50m YELLOW SAND 4.50m-6.00m SAND GREY	1513m	South West
GW027664	0.00m-0.30m Loam Sand 0.30m-2.43m Sand Clean 2.43m-2.74m Peat Wood Bands 2.74m-3.04m Sand 3.04m-6.09m Sand White Water Supply 6.09m-6.11m Rock	1517m	North West

Groundwater No	Drillers Log	Distance	Direction
GW103941	0.00m-1.00m FILL 1.00m-4.00m WHITE/ORANGE SAND 4.00m-5.00m SAND 5.00m-9.00m WHITE SAND 9.00m-10.00m SAND LIGHT BROWN 10.00m-13.00m SAND LIGHT BROWN WITH PEAT 13.00m-19.00m CLAY GREY 19.00m-21.00m SANDSTONE YELLOW RED	1517m	East
GW103942	0.00m-7.00m SAND GREY 7.00m-9.00m SAND BROWN GREY 9.00m-12.00m SANDSTONE BROWN	1517m	East
GW103943	0.00m-1.00m WHITE SAND WITH SEA SHELLS 1.00m-3.00m WHITE SAND 3.00m-8.00m WHITE AND BROWN SAND 8.00m-10.00m BROWN SAND 10.00m-13.00m BROWN SANDSTONE 13.00m-14.00m GREY SANDSTONE	1517m	East
GW103944	0.00m-7.00m SAND GREY 7.00m-14.00m SAND,STONE,PEAT 14.00m-15.00m CLAY RED BROWN 15.00m-17.00m CLAY 17.00m-18.00m SANDSTONE BROWN AND GREY	1517m	East
GW103945	0.00m-1.00m FILL 1.00m-5.00m LIGHT BROWN SAND 5.00m-6.00m GREY SAND SEA SHELLS 6.00m-8.00m WHITE SAND 8.00m-15.00m GREY SAND WITH PEAT 15.00m-18.00m BROWN CLAY 18.00m-21.00m BROWN SANDSTONE	1517m	East
GW103946	0.00m-6.00m SAND WHITE BROWN 6.00m-7.00m SAND DARK GREY 7.00m-8.00m SAND WHITE 8.00m-9.00m SAND DARK GREY WHITE 9.00m-10.00m SAND DARK GREY W.B. 10.00m-11.00m SAND DARK GREY WHITE 11.00m-12.00m SAND WHITE 12.00m-13.00m SAND BROWN 13.00m-15.00m SANDSTONE WHITE 15.00m-17.00m SANDSTONE LIGHT BROWN	1517m	East
GW103947	0.00m-2.00m WHITE BROWN SAND 2.00m-3.00m WHITE SAND BROWN CLAY 3.00m-8.00m WHITE DARK BROWN SAND 8.00m-11.00m WHITE GREY SAND 11.00m-13.00m YELLOW BROWN SAND 13.00m-15.00m BROWN RED WHITE CLAY 15.00m-16.00m RED BROWN WHITE CLAY 16.00m-18.00m BROWN SANDSTONE	1517m	East
GW103948	0.00m-5.00m FILL 5.00m-10.00m GREY SAND WITH PEAT 10.00m-11.00m WHITE SAND WITH PEAT 11.00m-14.00m WHITE SAND WITH PEAT 14.00m-15.00m WHITE SAND WITH PEAT 15.00m-16.00m RED SANDSTONE WHITE CLAY 16.00m-18.00m RED SANDSTONE WHITE GREY CLAY	1517m	East
GW103949	0.00m-8.00m FILL 8.00m-9.00m WHITE SAND/SEA SHELLS 9.00m-13.00m GREY WHITE SAND 13.00m-14.00m GREY WHITE SAND AND PEAT 14.00m-15.00m WHITE AND BROWN SAND 15.00m-16.00m DARK GREY WHITE SAND 16.00m-17.00m RED WHITE CLAY 17.00m-18.00m WHITE YELLOW CLAY 18.00m-19.00m WHITE BROWN CLAY 19.00m-20.00m WHITE YELLOW GREY CLAY 20.00m-21.00m GREY SANDSTONE AND GREY CLAY	1517m	East
GW103950	0.00m-6.00m FILL 6.00m-7.00m DARK GREY SAND 7.00m-15.00m DARK GREY SAND AND PEAT 15.00m-16.00m DARK GREY SAND AND GREY CLAY 16.00m-17.00m YELLOW RED BROWN CLAY 17.00m-18.00m YELLOW RED BROWN CLAY 18.00m-20.00m GREY SANDY CLAY 20.00m-21.00m GREY SANDSTONE	1517m	East

Groundwater No	Drillers Log	Distance	Direction
GW103951	0.00m-1.30m FILL 1.30m-13.90m LAYED SANDS 13.90m-15.40m PEAT 15.40m-18.60m LAYED SANDS 18.60m-24.80m GREY CLAY 24.80m-38.20m GREY SANDSTONE 38.20m-47.30m MOIST WHITE SANDSTONE 47.30m-51.70m YELLOW SANDSTONE AND CLAY 51.70m-54.40m FRACTURED WHITE SANDSTONE 54.40m-62.30m GREY LITTLE SANDSTONE 62.30m-63.70m SHALE 63.70m-66.80m SHALE/QUARTZ/SANDSTONE 66.80m-85.70m GREY SANDSTONE 85.70m-93.20m WHITE SANDSTONE 93.20m-96.50m SILTSTONE 96.50m-101.80m WHITE SANDSTONE M.G 101.80m-117.20m DARK GREY SHALE 117.20m-130.10m WHITE M.G. SANDSTONE 130.10m-135.00m WHITE M.G. SANDSTONE 135.00m-136.30m SHALE 136.30m-139.50m WHITE M.G. SANDSTONE 139.50m-142.00m FRACTURED GREY SANDSTONE 142.00m-149.00m GREY SANDSTONE M.G.	1517m	East
GW109645	0.00m-8.54m UNCONSOLIDATED ALL SANDS.	1524m	South West
GW016108	0.00m-7.62m Sand	1531m	South West
GW023304	0.00m-0.91m Sand Black 0.91m-4.26m Sand White Water Supply	1531m	South West
GW109963	0.00m-8.00m SAND	1548m	North West
GW108406	0.00m-8.00m sand	1562m	North West
GW109964	0.00m-8.00m SAND	1569m	North West
GW023583	0.00m-8.22m Sand Water Supply	1571m	South West
GW106206	0.00m-5.18m sand, unconsolidated	1571m	South West
GW108588	0.00m-8.00m Sand	1571m	North West
GW109965	0.00m-8.00m SAND	1582m	North West
GW108495	0.00m-9.46m Sand, unconsolidated	1602m	South West
GW101328	0.00m-7.62m Unconsolidated, all sand, small seashells	1603m	South West
GW107531	0.00m-0.30m TOPSOIL 0.30m-7.20m YELLOW SAND 7.20m-14.00m GREY SAND	1620m	South West
GW109966	0.00m-3.00m CLAY	1635m	North West
GW107148	0.00m-5.79m sand	1646m	South West
GW114745	0.00m-0.12m CONCRETE PAVEMENT 0.12m-0.15m SANDSTONE 0.15m-13.95m SANDSTONE	1648m	North West
GW114744	0.00m-0.05m SAND CLAYEY,SANDY CLAY (FILL) 0.05m-17.00m SANDSTONE	1653m	North West
GW107344	0.00m-0.30m topsoil 0.30m-2.50m sand, grey 2.50m-4.00m sand, yellow	1661m	South West
GW105153	0.00m-5.49m UNCONSOLIDATED ALL SANDS	1662m	South West
GW024109	0.00m-2.13m Sand Water Supply	1672m	North West
GW023310	0.00m-3.65m Sand Water Supply	1677m	South West
GW101137	0.00m-6.71m Unconsolidated - all sand	1681m	South West

Groundwater No	Drillers Log	Distance	Direction
GW106889	0.00m-7.93m Sand, unconsolidated	1685m	South West
GW108590	0.00m-3.96m Sand, unconsolidated then Clay	1692m	South West
GW105158	0.00m-4.58m UNCONSOLIDATED ALL SANDS	1697m	South West
GW013657	0.00m-7.62m Sand Water Supply	1718m	South West
GW107552	0.00m-9.15m Sand, unconsolidated	1721m	South West
GW107349	0.00m-7.32m Sand, unconsolidated	1748m	South West
GW108300	0.00m-7.32m sand	1754m	South West
GW106986	0.00m-7.01m Sand, unconsolidated	1768m	South West
GW109666	0.00m-10.68m UNCONSOLIDATED ALL SAND	1783m	South
GW106128	0.00m-0.30m topsoil 0.30m-1.50m sand, brown 1.50m-5.00m sand, yellow 5.00m-7.00m sand, yellow with some shells	1790m	South West
GW105975	0.00m-8.23m sand, unconsolidated	1794m	South West
GW112342	0.00m-9.15m UNCONSOLIDATED ALL SAND.	1796m	South West
GW100473	0.00m-67.10m UNCONSOLIDATED. ALL SAND WITH SMALL SEA SHELLS	1797m	South West
GW107662	0.00m-0.30m topsoil 0.30m-4.50m sand, yellow 4.50m-6.00m sand, yellow and shells	1813m	South West
GW111713	0.00m-7.93m UNCONSOLIDATED ALL SANDS.	1816m	South West
GW108584	0.00m-5.79m Sand, unconsolidated	1830m	South West
GW106851	0.00m-2.00m sand, dry 2.00m-2.50m sand, wet 2.50m-3.00m peat, wet 3.00m-3.50m sand, wet	1831m	South
GW111227	0.00m-8.54m UNCONSOLIDATED ALL SAND.	1831m	South West
GW027569	0.00m-8.23m UNCONSOLIDATED ALL SANDS	1837m	South West
GW102226	0.00m-7.63m SAND, UNCONSOLIDATED	1839m	South West
GW025565	0.00m-5.48m Sand Water Supply	1843m	South West
GW110908	0.00m-0.30m ROAD BASE GREY 0.30m-1.00m SAND WITH GRAVEL GREY 1.00m-4.00m SAND DARK GREY 4.00m-6.00m SAND LIGHT GREY,BROWN	1848m	East
GW111666	0.00m-7.63m UNCONSOLIDATED ALL SANDS	1850m	South West
GW106474	0.00m-7.63m sand	1851m	South West
GW107105	0.00m-7.26m sand, unconsolidated	1871m	South West
GW107973	0.00m-7.00m sand	1880m	South West
GW107542	0.00m-7.32m Sand, unconsolidated	1888m	South West
GW023837	0.00m-1.82m Sand Grey 1.82m-5.18m Sand White Water Supply	1889m	South West
GW110907	0.00m-0.30m ROADBASE GREY 0.30m-0.90m SILTY SAND 0.90m-1.20m SAND,SILTY GREY BROWN 1.20m-3.50m SAND DARK GREY 3.50m-5.80m SAND LIGHT GREY	1889m	East

Groundwater No	Drillers Log	Distance	Direction
GW110906	0.00m-1.00m ROADBASE GREY 1.00m-2.80m SAND GREY 2.80m-5.80m SAND BROWN	1899m	East
GW108796	0.00m-7.63m sand	1903m	South West
GW110898	0.00m-8.45m UNCONSOLIDATED ALL SAND	1918m	South West
GW106946	0.00m-6.00m sand	1928m	South West
GW111037	0.00m-6.00m ALL SAND	1928m	South West
GW110097	0.00m-6.71m UNCONSOLIDATED ALL SANDS	1937m	South West
GW111443	0.00m-9.15m UNCONSOLIDATED ALL SAND	1938m	South West
GW107883	0.00m-0.30m topsoil 0.30m-4.20m sand, brown 4.20m-5.20m sand, yellow 5.20m-7.00m sand, grey	1952m	South West
GW023257	0.00m-0.30m Sand Grey 0.30m-5.48m Sand White Water Supply	1955m	South West
GW106563	0.00m-6.71m sand, unconsolidated	1968m	South West
GW107026	0.00m-9.76m Sand, unconsolidated	1976m	South
GW027570	0.00m-0.30m Topsoil Sandy 0.30m-3.50m Sand White Moist 3.50m-5.33m Sand Light Brown Wet 5.33m-6.85m Peat Black Moist Sandy 6.85m-10.66m Sand White Wet Fine 6.85m-10.66m Peat Interlayere 10.66m-12.80m Sand Black Moist Peaty 12.80m-15.24m Sand White Wet Coarse 12.80m-15.24m Clay Seams	1980m	South West
GW110911	0.00m-0.30m ROADBASE GREY 0.30m-2.20m SAND SILTY WITH GRAVEL GREY 2.20m-3.50m SAND WITH SHELLS GREY 3.50m-6.00m SAND WITH SHELLS DARK GREY/BLACK	1982m	East

Drill Log Data Source: NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corp

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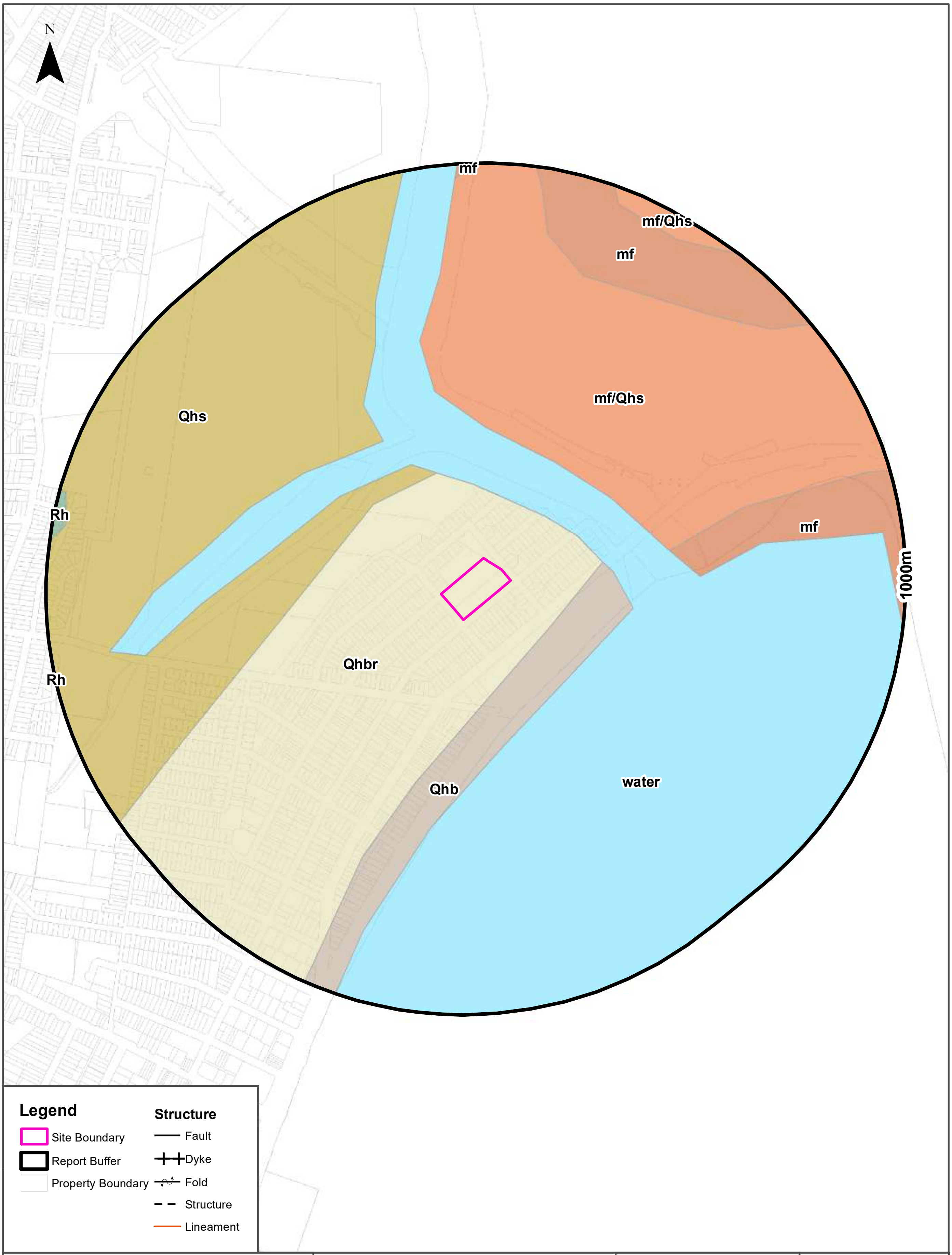
Geology 1:100,000

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216



Scale:

Data Sources: Property Boundaries & Topographic Data:
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Coordinate System:
GDA 1994 MGA Zone 56

Date: 01 November 2018

Geology

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Geological Units

What are the Geological Units onsite?

Symbol	Description	Unit Name	Group	Sub Group	Age	Dom Lith	Map Sheet	Dataset
Qhbr	Quartz sand, minor shell content, interdune (swale) silt and fine sand				Quaternary		Sydney	1:100,000

What are the Geological Units within the dataset buffer?

Symbol	Description	Unit Name	Group	Sub Group	Age	Dom Lith	Map Sheet	Dataset
mf	Man-made fill. Dredged estuarine sand and mud, demolition rubble, industrial and household waste.				Quaternary		Sydney	1:100,000
mf/Qhs							Sydney	1:100,000
Qhb	Coarse quartz sand, verying amounts of shell fragment				Quaternary		Sydney	1:100,000
Qhbr	Quartz sand, minor shell content, interdune (swale) silt and fine sand				Quaternary		Sydney	1:100,000
Qhs	Peat, sandy peat, and mud.				Quaternary		Sydney	1:100,000
Rh	Medium to coarse grained quartz sandstone, very minor shale and laminate lenses				Triassic		Sydney	1:100,000
water							Sydney	1:100,000

Geological Structures

What are the Geological Structures onsite?

Feature	Name	Description	Map Sheet	Dataset
No features				1:100,000

What are the Geological Structures within the dataset buffer?

Feature	Name	Description	Map Sheet	Dataset
No features				1:100,000

Geological Data Source : NSW Department of Industry, Resources & Energy

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Naturally Occurring Asbestos Potential

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Naturally Occurring Asbestos Potential

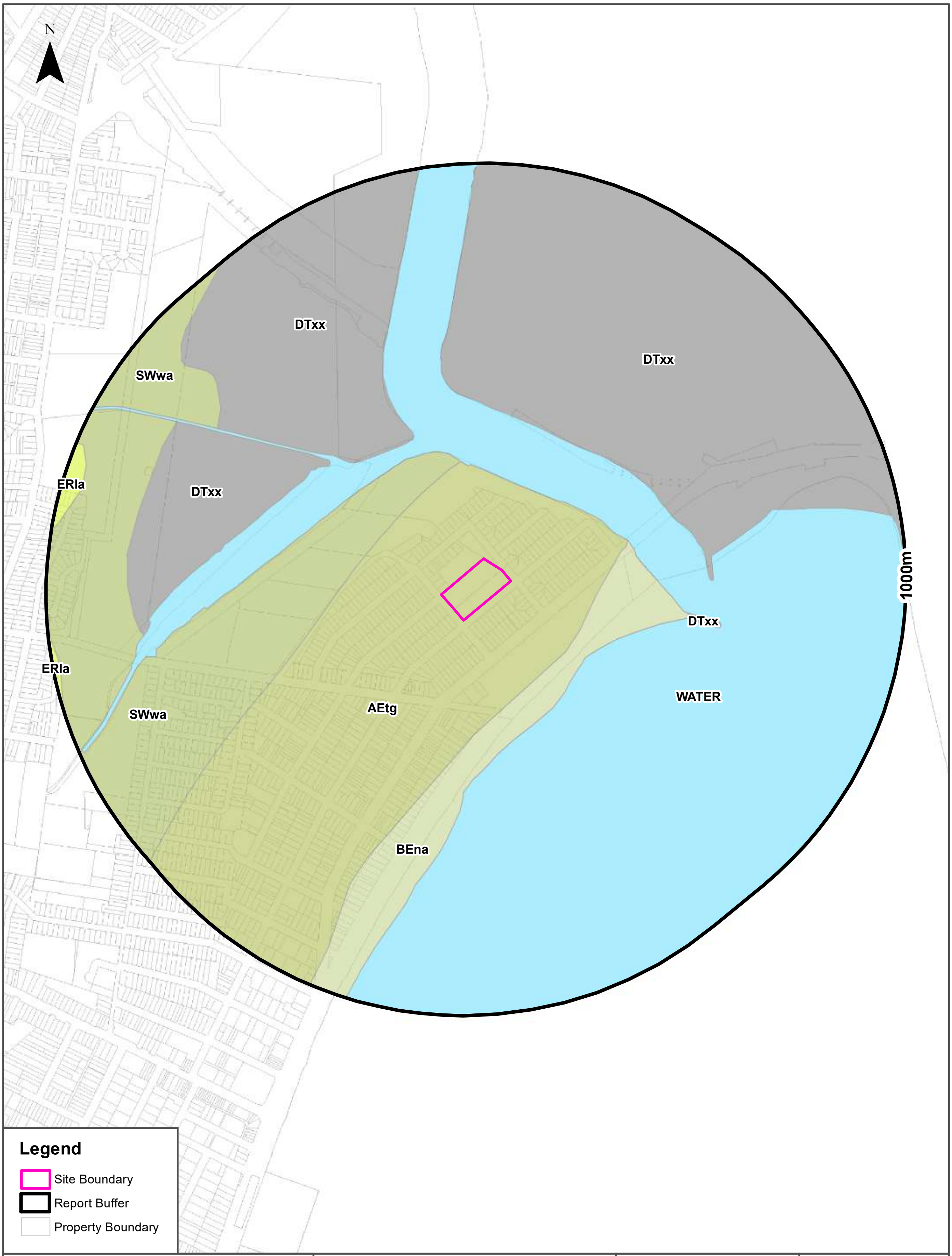
Naturally Occurring Asbestos Potential within the dataset buffer:

Potential	Sym	Strat Name	Group	Formation	Scale	Min Age	Max Age	Rock Type	Dom Lith	Description	Dist	Dir
No records in buffer												

Mining Subsidence District Data Source: © State of New South Wales through NSW Department of Industry, Resources & Energy

Soil Landscapes

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216



Legend

- 🟪 Site Boundary
- ⬛ Report Buffer
- ☐ Property Boundary

Scale:

Data Sources: Property Boundaries & Topographic Data:
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Coordinate System:
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Soils

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Soil Landscapes

What are the onsite Soil Landscapes?

Soil Code	Name	Group	Process	Map Sheet	Scale
AEtg	TUGGERAH		AEOLIAN	Sydney	1:100,000

What are the Soil Landscapes within the dataset buffer?

Soil Code	Name	Group	Process	Map Sheet	Scale
AEtg	TUGGERAH		AEOLIAN	Sydney	1:100,000
BEna	NARRABEEN		BEACH	Sydney	1:100,000
DTxx	DISTURBED TERRAIN		DISTURBED TERRAIN	Sydney	1:100,000
ERla	LAMBERT		EROSIONAL	Sydney	1:100,000
SWwa	WARRIEWOOD		SWAMP	Sydney	1:100,000
WATER	WATER		WATER	Sydney	1:100,000

Soils Landscapes Data Source : NSW Office of Environment and Heritage

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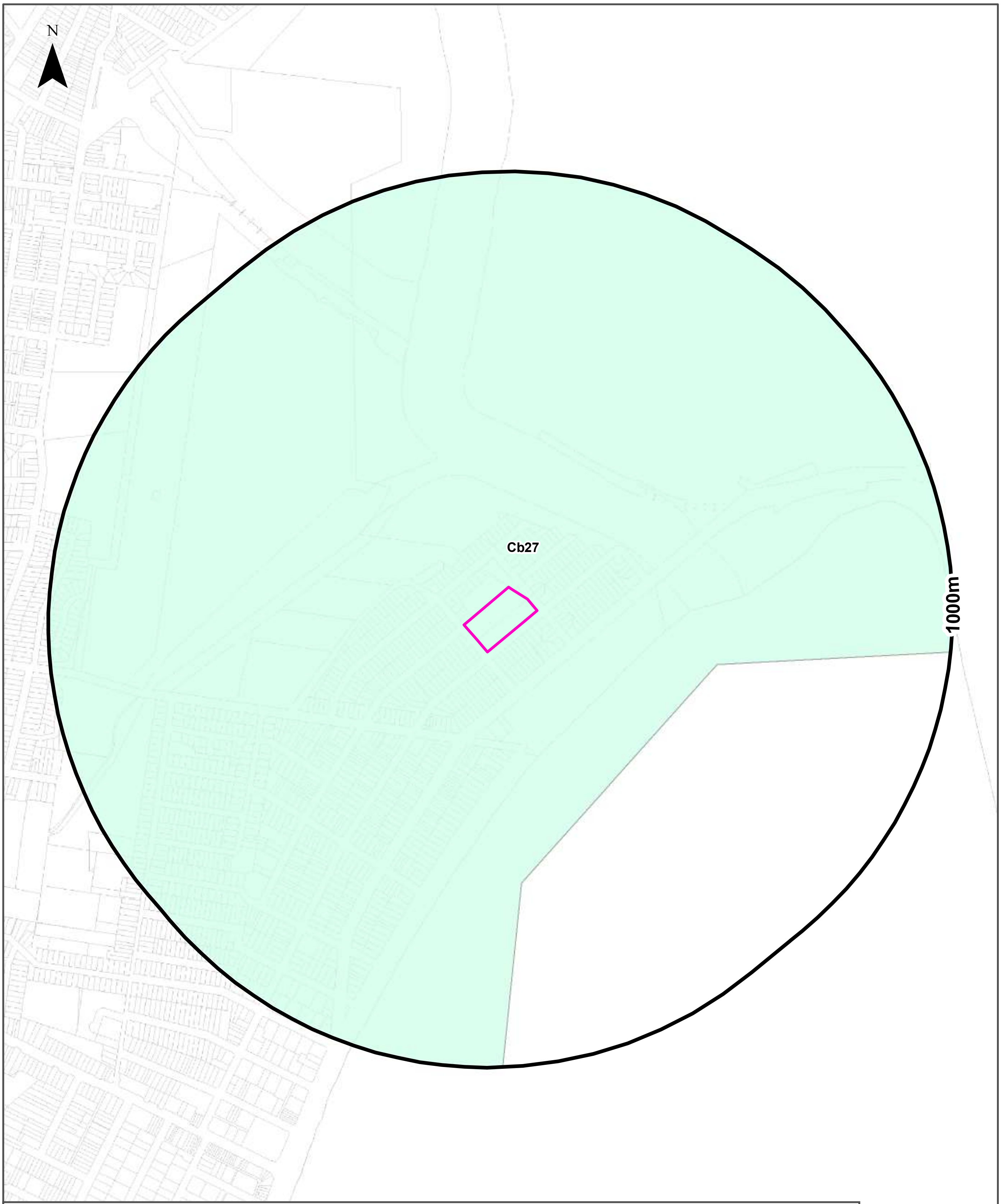
Atlas of Australian Soils

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216



Legend

- Site Boundary
- Report Buffer
- Property Boundary

Australian Soil Classification Orders

- Anthroposol
- Calcarosol
- Chromosol
- Dermosol
- Ferrosol
- Hydrosol
- Kandosol
- Kurosol
- Organosol
- Podosol
- Rudosol
- Sodosol
- Tenosol
- Vertosol
- Lake
- No Data

Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data:
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GDA 1994 MGA Zone 56

Date: 01 November 2018

Soils

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Atlas of Australian Soils

Soil mapping units and Australian Soil Classification orders within the dataset buffer:

Map Unit Code	Soil Order	Map Unit Description	Distance
Cb27	Podosol	Coastal sand plains and dunes, lagoons, and swampy areas: chief soils are leached sands (Uc2.3 and Uc2.2). Associated are dunes of siliceous sands (Uc1.2) and/or calcareous sands (Uc1.l) fringing the coastline; and swampy areas of (Uf6) soils and (Uc1.2) soils with peaty surfaces. Unit Cb27 has similarities with units Cb28 and Ca6.	0m

Atlas of Australian Soils Data Source: CSIRO

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Acid Sulfate Soils

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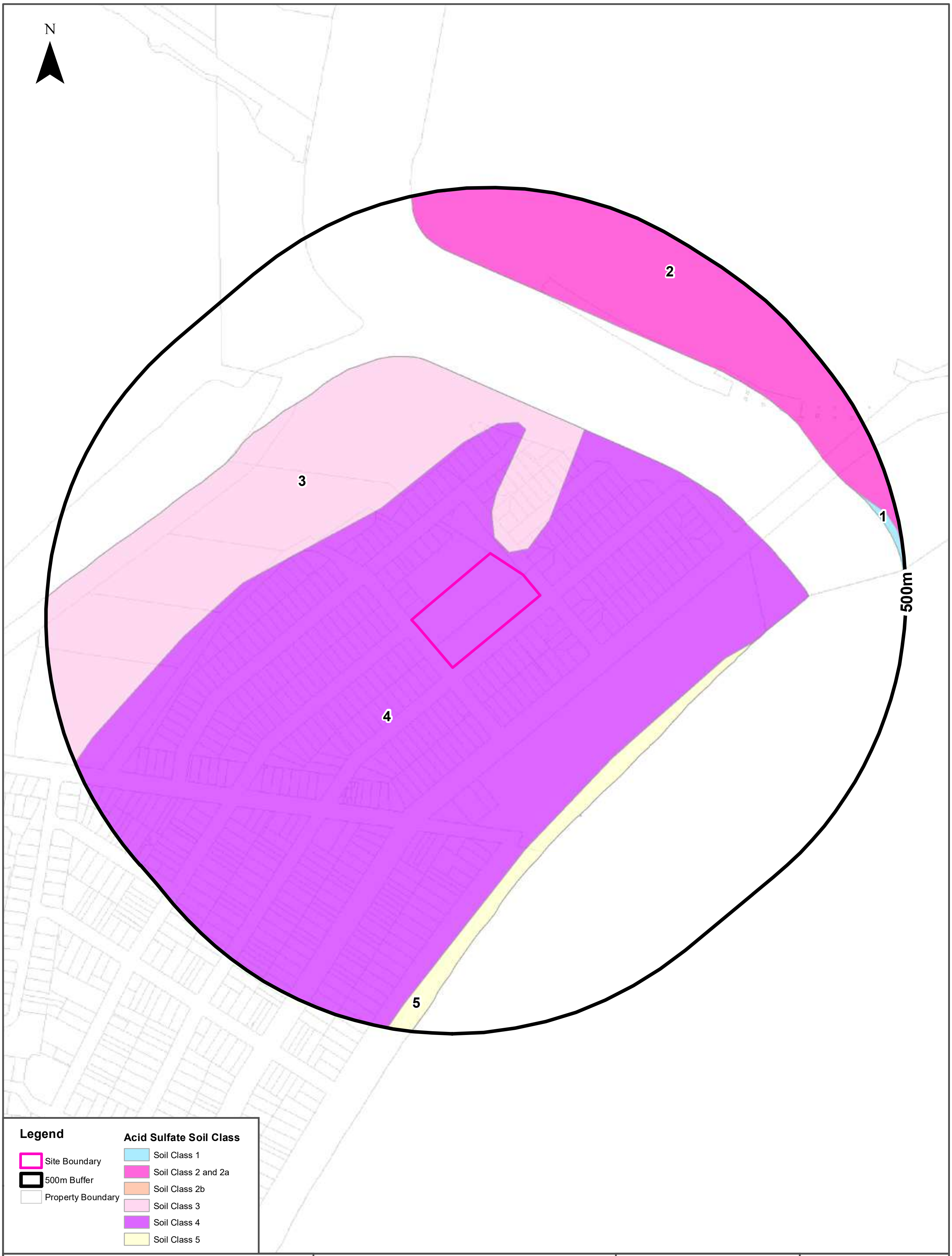

Scale: 0 100 200 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018	Coordinate System: GDA 1994 MGA Zone 56	Date: 01 November 2018

Acid Sulfate Soils

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Environmental Planning Instrument - Acid Sulfate Soils

What is the on-site Acid Sulfate Soil Plan Class that presents the largest environmental risk?

Soil Class	Description	EPI
4	Works more than 2 metres below natural ground surface present an environmental risk; Works by which the watertable is likely to be lowered more than 2 metres below natural ground surface, present an environmental risk	Rockdale Local Environmental Plan 2011

If the on-site Soil Class is 5, what other soil classes exist within 500m?

Soil Class	Description	EPI	Distance	Direction
N/A				

Acid Sulfate Data Source Accessed 23/10/2018: NSW Crown Copyright - Planning and Environment
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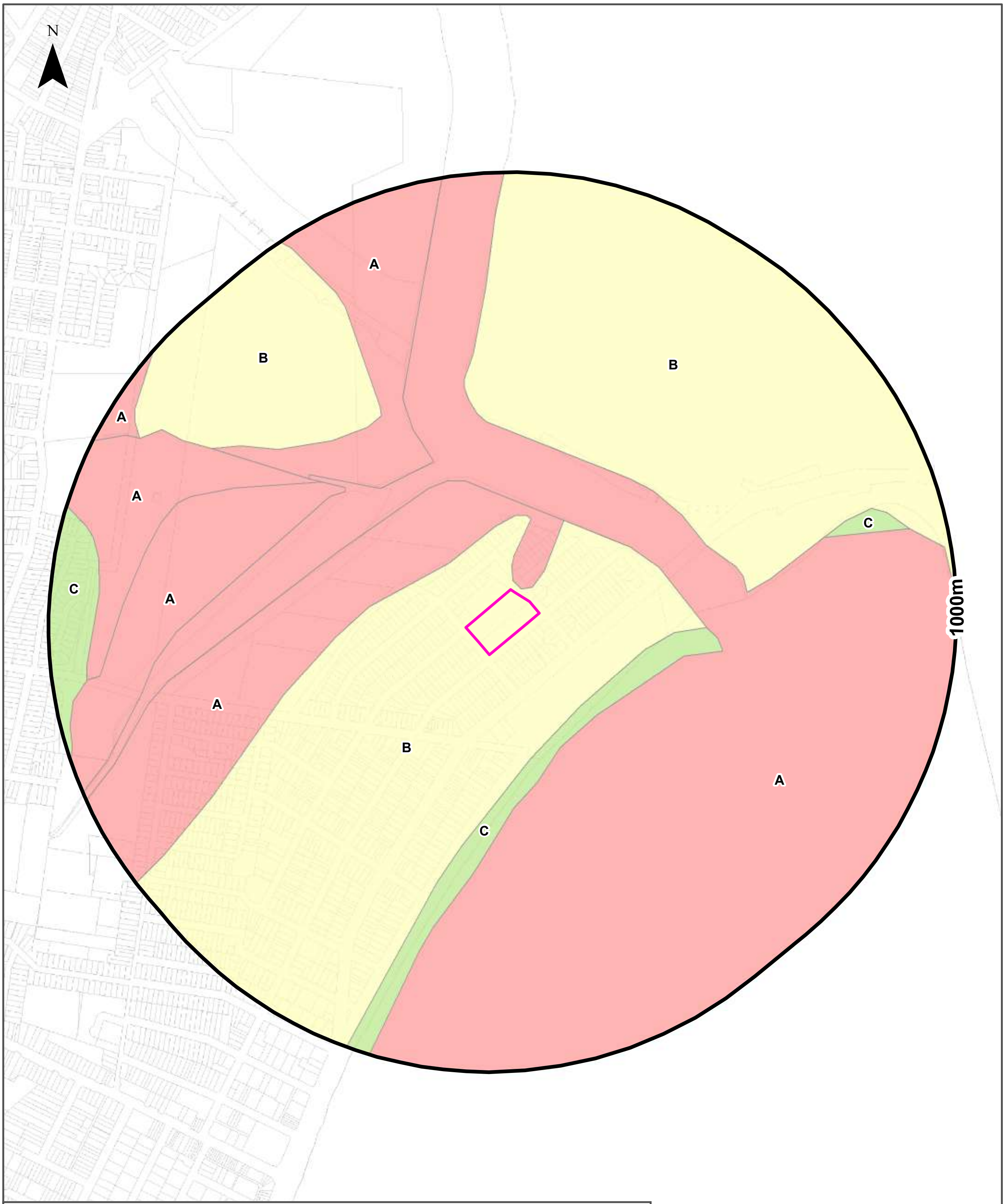
Atlas of Australian Acid Sulfate Soils

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

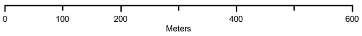


Legend

Probability of occurrence of Acid Sulfate Soils

🟪 Site Boundary	🟥 A. High (>70%)	🟩 C. Extremely Low (1-5%)	☐ No Data
⬛ Report Buffer	🟨 B. Low (6-70%)	⬜ D. No Chance (0%)	
☐ Property Boundary			

Scale:



Data Sources: Property Boundaries & Topographic Data:
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Coordinate System:
GDA 1994 MGA Zone 56

Date: 01November 2018

Acid Sulfate Soils

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Atlas of Australian Acid Sulfate Soils

Atlas of Australian Acid Sulfate Soil categories within the dataset buffer:

Class	Description	Distance
B	Low Probability of occurrence. 6-70% chance of occurrence.	0m
A	High Probability of occurrence. >70% chance of occurrence.	14m
C	Extremely low probability of occurrence. 1-5% chance of occurrence with occurrences in small localised areas.	231m

Atlas of Australian Acid Sulfate Soils Data Source: CSIRO

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Dryland Salinity

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Dryland Salinity - National Assessment

Is there Dryland Salinity - National Assessment data onsite?

No

Is there Dryland Salinity - National Assessment data within the dataset buffer?

No

What Dryland Salinity assessments are given?

Assessment 2000	Assessment 2020	Assessment 2050	Distance	Direction
N/A	N/A	N/A	N/A	N/A

Dryland Salinity Data Source : National Land and Water Resources Audit
The Commonwealth and all suppliers of source data used to derive the maps of "Australia, Forecast Areas Containing Land of High Hazard or Risk of Dryland Salinity from 2000 to 2050" do not warrant the accuracy or completeness of information in this product. Any person using or relying upon such information does so on the basis that the Commonwealth and data suppliers shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information. Any persons using this information do so at their own risk.
In many cases where a high risk is indicated, less than 100% of the area will have a high hazard or risk.

Dryland Salinity Potential of Western Sydney

Dryland Salinity Potential of Western Sydney within the dataset buffer?

Feature Id	Classification	Description	Distance	Direction
N/A	Outside Data Coverage			

Dryland Salinity Potential of Western Sydney Data Source : NSW Office of Environment and Heritage
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Mining Subsidence Districts

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Mining Subsidence Districts

Mining Subsidence Districts within the dataset buffer:

District	Distance	Direction
There are no Mining Subsidence Districts within the report buffer		

Mining Subsidence District Data Source: © Land and Property Information (2016)

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Environmental Zoning

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

State Environmental Planning Policy Protected Areas

Are there any State Environmental Planning Policy Protected Areas onsite or within the dataset buffer?

Dataset	Onsite	Within Site Buffer	Distance
SEPP14 - Coastal Wetlands	No	No	N/A
SEPP26 - Littoral Rainforests	No	No	N/A
SEPP71 - Coastal Protection Zone	No	No	N/A

SEPP Protected Areas Data Source: NSW Department of Planning & Environment
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State Environmental Planning Policy Major Developments (2005)

State Environmental Planning Policy Major Developments within the dataset buffer:

Map Id	Feature	Effective Date	Distance	Direction
N/A	No records within buffer			

SEPP Major Development Data Source: NSW Department of Planning & Environment
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State Environmental Planning Policy Strategic Land Use Areas

State Environmental Planning Policy Strategic Land Use Areas onsite or within the dataset buffer:

Strategic Land Use	SEPPNo	Effective Date	Amendment	Amendment Year	Distance	Direction
No records within buffer						

SEPP Strategic Land Use Data Source: NSW Department of Planning & Environment
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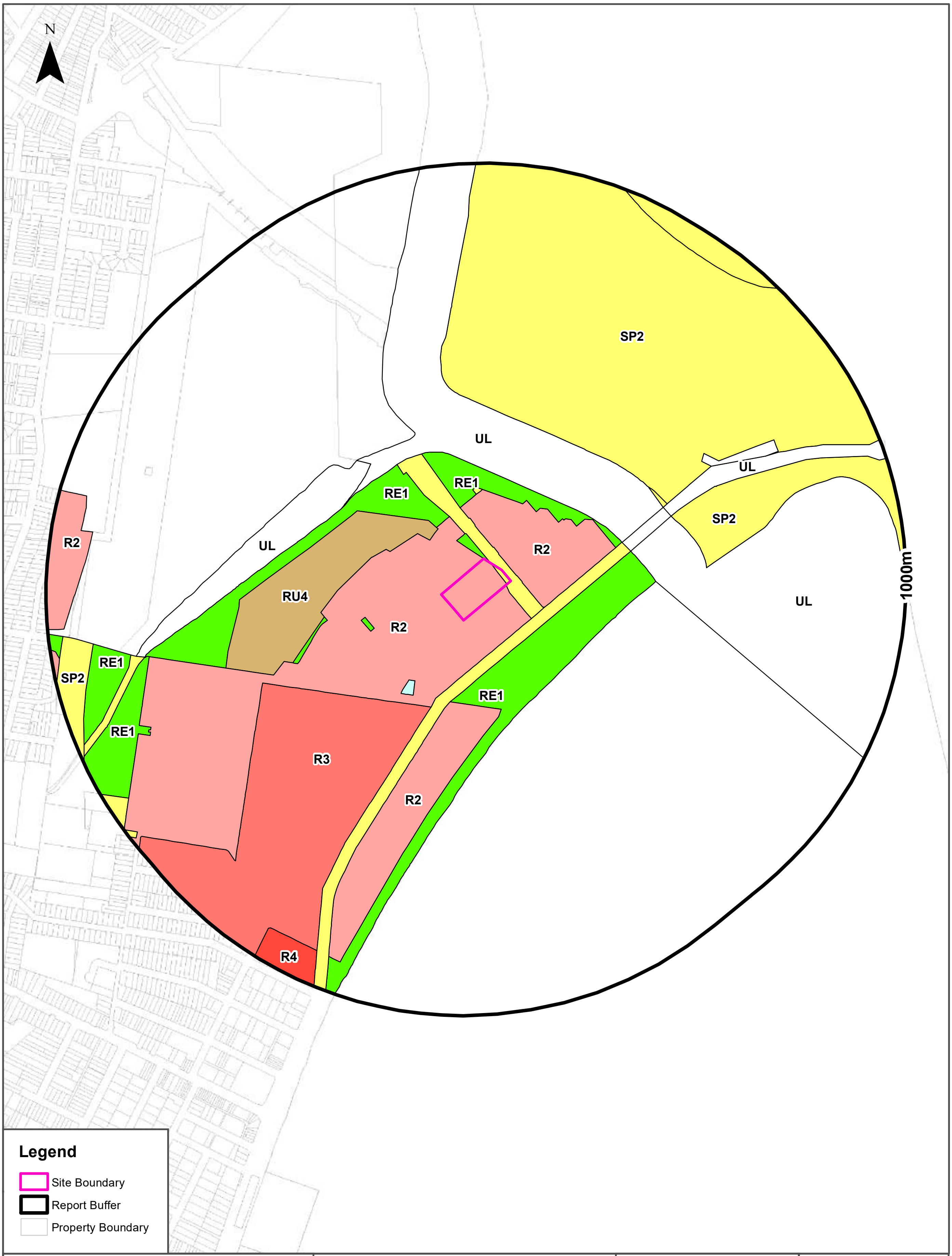
EPI Planning Zones

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216



Legend

🟪 Site Boundary
⬛ Report Buffer
⬜ Property Boundary

Scale:
0 100 200 400 600
Meters

Data Sources: Property Boundaries & Topographic Data:
© Department Finance, Services & Innovation 2018
Planning: NSW Crown Copyright - Planning & Environment

Coordinate System:
GDA 1994 MGA Zone 56

Date: 01 November 2018

Environmental Planning Instrument

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Land Zoning

What Environmental Planning Instrument Land Zones exist within the dataset buffer?

Zone	Description	Purpose	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
R2	Low Density Residential		Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		0m	Onsite
SP2	Infrastructure	Classified Road	Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		0m	Onsite
RE1	Public Recreation		Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		0m	North
R2	Low Density Residential		Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		20m	North East
SP2	Infrastructure	Classified Road	Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		106m	South West
RU4	Primary Production Small Lots		Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		123m	West
RE1	Public Recreation		Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		136m	West
RE1	Public Recreation		Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		137m	South
RE1	Public Recreation		Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		141m	North
SP2	Infrastructure	Drainage	Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		163m	North
RE1	Public Recreation		Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		190m	West
B1	Neighbourhood Centre		Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		196m	South West
UL	Unzoned Land		Rockdale Local Environmental Plan 2011	11/07/2014	11/07/2014	12/10/2018	Amendment No 1	207m	North
R2	Low Density Residential		Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		209m	South
R3	Medium Density Residential		Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		234m	South West
RE1	Public Recreation		Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		296m	West
UL	Unzoned Land		Rockdale Local Environmental Plan 2011	11/07/2014	11/07/2014	12/10/2018	Amendment No 1	313m	East
UL	Unzoned Land		Rockdale Local Environmental Plan 2011	11/07/2014	11/07/2014	12/10/2018	Amendment No 1	333m	West
SP2	Infrastructure	Airport	Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		356m	North East
SP2	Infrastructure	Airport	Rockdale Local Environmental Plan 2011	11/07/2014	11/07/2014	12/10/2018	Amendment No 1	421m	North East
UL	Unzoned Land		Rockdale Local Environmental Plan 2011	11/07/2014	11/07/2014	12/10/2018	Amendment No 1	429m	East
SP2	Infrastructure	Airport	Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		438m	East
UL	Unzoned Land		Rockdale Local Environmental Plan 2011	11/07/2014	11/07/2014	12/10/2018	Amendment No 1	570m	North East
RE1	Public Recreation		Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		756m	South West
SP2	Infrastructure	Drainage	Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		766m	West
RE1	Public Recreation		Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		800m	West
SP2	Infrastructure	Classified Road	Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		890m	South West
R2	Low Density Residential		Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		896m	West

Zone	Description	Purpose	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
R4	High Density Residential		Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		913m	South West
SP2	Infrastructure	Airport	Botany Bay Local Environmental Plan 2013	21/06/2013	21/06/2013	19/02/2016		939m	North East
SP2	Infrastructure	School	Rockdale Local Environmental Plan 2011	30/08/2013	30/08/2013	12/10/2018	Amendment No 4	944m	South West
RE1	Public Recreation		Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		963m	West

Environmental Planning Instrument Data Source: NSW Crown Copyright - Planning & Environment

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Environmental Planning Instrument

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Minimum Lot Size

What are the onsite Environmental Planning Instrument Minimum Lot Sizes?

Symbol	Minimum Lot Size	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Percentage of Site Area
G	450 m²	Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	04/05/2018		97.36

Maximum Height of Buildings

What are the onsite Environmental Planning Instrument Maximum Height of Buildings?

Symbol	Maximum Height of Building	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Percentage of Site Area
9	8.50 m	Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018		95.1

Floor Space Ratio

What are the onsite Environmental Planning Instrument Floor Space Ratios?

Symbol	Floor Space Ratio	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Percentage of Site Area
4	0.50	LEP	05/12/2011	05/12/2011	12/10/2018		95.1

Land Application

What are the onsite Environmental Planning Instrument Land Applications?

Application Type	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Percentage of Site Area
Included	Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	05/12/2011		100

Land Reservation Acquisition

What are the onsite Environmental Planning Instrument Land Reservation Acquisitions?

Reservation	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Comments	Percentage of Site Area
Infrastructure	Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	12/10/2018			4.9

Environmental Planning Instrument Data Source: NSW Crown Copyright - Planning & Environment

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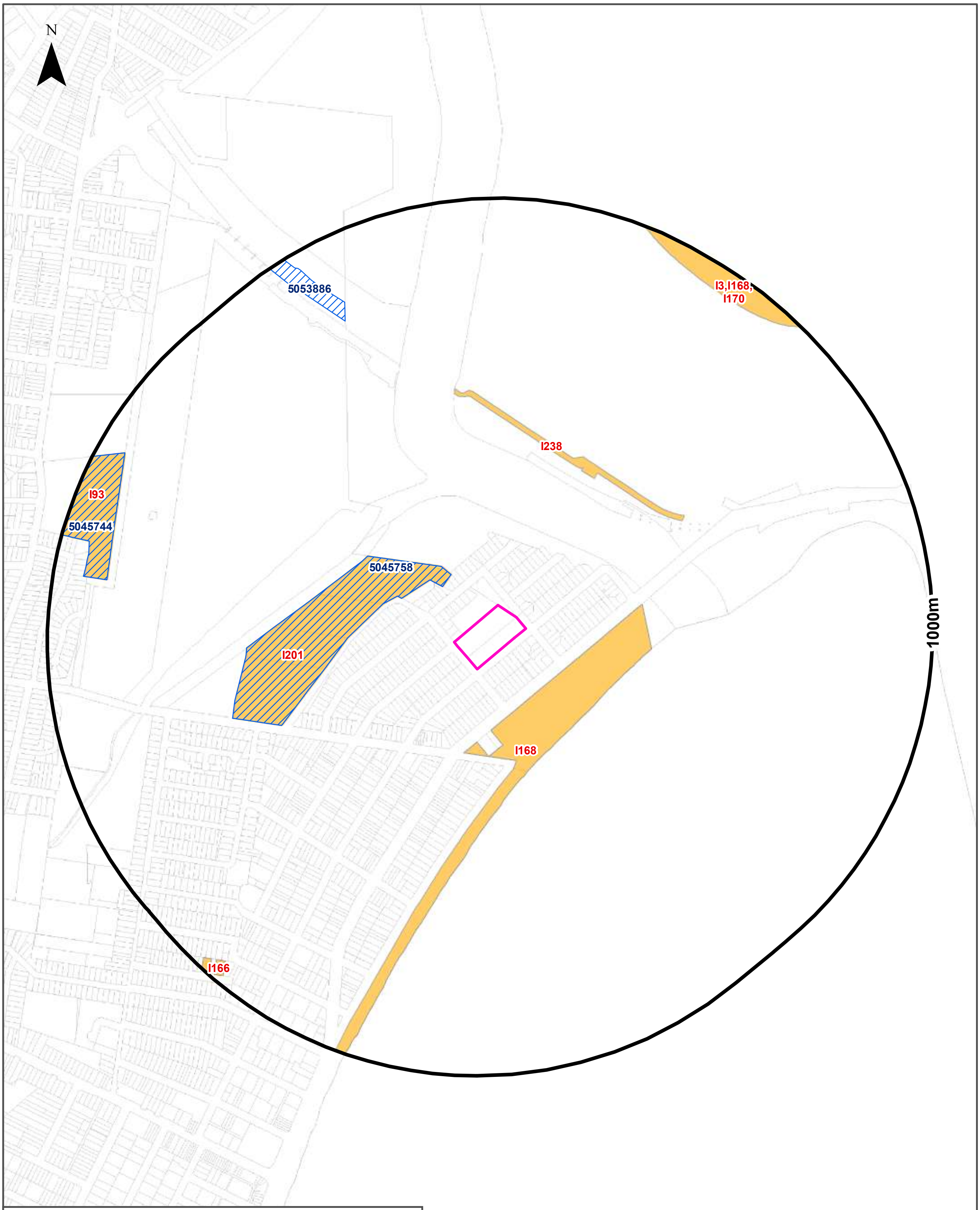
Heritage Items

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216



Legend

- ▢ Property Boundary
- ▢ Site Boundary
- ▢ Report Buffer
- ▨ State Heritage Items
- ■ Local Heritage Items

Scale:

Data Sources: Property Boundaries & Topographic Data:
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Heritage - NSW Crown Copyright - Planning & Environment

Coordinate System:
GDA 1994 MGA Zone 56

Date: 01 November 2018

Heritage

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

State Heritage Register - Curtilages

What are the State Heritage Register Items located within the dataset buffer?

Map Id	Name	Address	LGA	Listing Date	Listing No	Plan No	Distance	Direction
5045758	Kyeemagh Market Gardens	Occupation Road, Rockdale	Rockdale	02/04/1999	01393	2260	123m	West
5053886	Western Outfall Main Sewer (Rockdale to Homesbush)	Valda Avenue (off south side of Kogarah Golf Course) Arncliffe	Rockdale	15/11/2002	01647	2060	793m	North West
5045744	Arncliffe Market Gardens	212 West Botany Street Banksia	Rockdale	02/04/1999	01395	2258	868m	West

Heritage Data Source: NSW Crown Copyright - Office of Environment & Heritage
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Environmental Planning Instrument - Heritage

What are the EPI Heritage Items located within the dataset buffer?

Map Id	Name	Classification	Significance	EPI	Published Date	Commenced Date	Currency Date	Distance	Direction
I201	Market Gardens	Item - General	State	Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	21/10/2016	123m	West
I168	Cook Park	Item - General	Local	Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	21/10/2016	137m	South
I238	Southern and Western Suburbs Ocean Outfall Sewer (SWSOOS), pipeline, aqueduct and bridge	Item - General	Local	Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	21/10/2016	389m	North East
I93	Market Gardens	Item - General	State	Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	21/10/2016	868m	West
I3,I168,I 170	Commonwealth Water Pumping Station and Sewerage Pumping Station	Item - General	State	Botany Bay Local Environmental Plan 2013	21/06/2013	21/06/2013	09/10/2015	939m	North East
I166	Houses - Brighton Parade precinct	Item - General	Local	Rockdale Local Environmental Plan 2011	05/12/2011	05/12/2011	21/10/2016	948m	South West

Heritage Data Source: NSW Crown Copyright - Planning & Environment
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Natural Hazards

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Bush Fire Prone Land

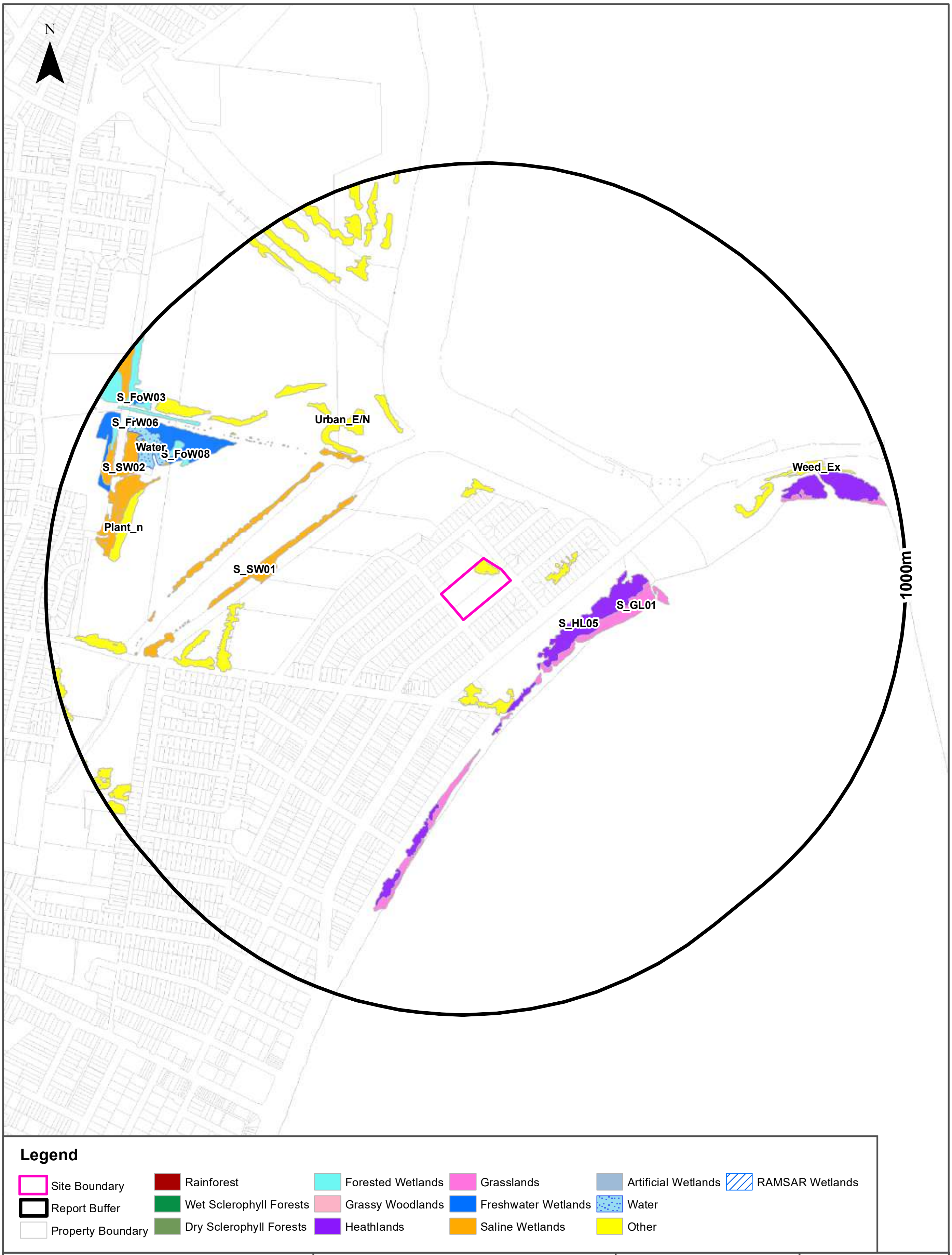
What are the nearest Bush Fire Prone Land Categories that exist within the dataset buffer?

Bush Fire Prone Land Category	Distance	Direction
No records within buffer		

NSW Bush Fire Prone Land - © NSW Rural Fire Service under Creative Commons 4.0 International Licence

Ecological Constraints - Native Vegetation & RAMSAR Wetlands

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216



Scale:

0 100 200 400 600

Meters

Propert Boundary Data Source:
© Department Finance, Services & Innovation 2018

Coordinate System:
GDA 1994 MGA Zone 56

Date: 01 November 2018

Ecological Constraints

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Native Vegetation

What native vegetation exists within the dataset buffer?

Map ID	Map Unit Name	Threatened Ecological Community NSW	Threatened Ecological Community EPBC Act	Understorey	Disturbance	Disturbance Index	Dominant Species	Dist	Direction
Urban_E/N	Urban_E/N: Urban Exotic/Native			00: Not assessed	00: Not assessed	0: Not assessed	Urban Exotic/Native	0m	Onsite
S_HL05	S_HL05: Coastal Foredune Wattle Scrub			19: Dense heath	20: Previously cleared 1943	3: High	A.longifolia_sophorae/L.laevigatum	171m	East
S_GL01	S_GL01: Beach Spinfex Grassland			00: Not assessed	00: Not assessed	0: Not assessed	S.sericea/C.glaucescens	210m	South East
S_SW01	S_SW01: Estuarine Mangrove Forest			00: Not assessed	20: Previously cleared 1943	3: High	Mangroves	324m	West
Weed_Ex	Weed_Ex: Weeds and Exotics			00: Not assessed	00: Not assessed	0: Not assessed	Exotic Species >90%cover	594m	East
Plant_n	Plant_n: Plantation (native and/or exotic)			00: Not assessed	00: Not assessed	0: Not assessed	Native or Exotic Plantations	630m	North West
S_FrW06	S_FrW06: Estuarine Reedland	Swamp Oak Floodplain Forest		00: Not assessed	00: Not assessed	0: Not assessed	P.australis/B.juncea	642m	North West
S_FoW08	S_FoW08: Estuarine Swamp Oak Forest	Swamp Oak Floodplain Forest		31: Saltmarsh	15: Regrowth	2: Moderate	C.glauca	715m	North West
S_FoW03	S_FoW03: Coastal Freshwater Swamp Forest			15: Grassy natives and exotics	23: Plantings	4: Very high	C.glauca	745m	North West
S_SW02	S_SW02: Estuarine Saltmarsh	Coastal Saltmarsh	Subtropical and Temperate Coastal Saltmarsh (possible)	00: Not assessed	00: Not assessed	0: Not assessed	S.repens/S.quinqueflora/S.virginicusJ.krausii	761m	West
Water	Water			00: Not assessed	00: Not assessed	0: Not assessed	Water	771m	North West

Native Vegetation of the Sydney Metropolitan Area : NSW Office of Environment and Heritage

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RAMSAR Wetlands

What RAMSAR Wetland areas exist within the dataset buffer?

Map Id	RAMSAR Name	Wetland Name	Designation Date	Source	Distance	Direction
N/A	No records in buffer					

RAMSAR Wetlands Data Source: © Commonwealth of Australia - Department of Environment

Ecological Constraints

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Groundwater Dependent Ecosystems Atlas

Type	GDE Potential	Geomorphology	Ecosystem Type	Aquifer Geology	Distance
N/A	No records within buffer				

Groundwater Dependent Ecosystems Atlas Data Source: The Bureau of Meteorology

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Ecological Constraints

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

Inflow Dependent Ecosystems Likelihood

Type	IDE Likelihood	Geomorphology	Ecosystem Type	Aquifer Geology	Distance
N/A	No records within buffer				

Inflow Dependent Ecosystems Likelihood Data Source: The Bureau of Meteorology

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Ecological Constraints

Jacobson Avenue & Beehag Street, Kyeemagh, NSW 2216

NSW BioNet Atlas

Species on the NSW BioNet Atlas that have a NSW or federal conservation status, a NSW sensitivity status, or are listed under a migratory species agreement, and are within 10km of the site?

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Amphibia	Crinia tinnula	Wallum Froglet	Vulnerable	Not Sensitive	Not Listed	
Animalia	Amphibia	Litoria aurea	Green and Golden Bell Frog	Endangered	Not Sensitive	Vulnerable	
Animalia	Aves	Actitis hypoleucos	Common Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Anseranas semipalmata	Magpie Goose	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Anthochaera phrygia	Regent Honeyeater	Critically Endangered	Not Sensitive	Critically Endangered	
Animalia	Aves	Apus pacificus	Fork-tailed Swift	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Ardea ibis	Cattle Egret	Not Listed	Not Sensitive	Not Listed	CAMBA;JAMBA
Animalia	Aves	Ardenna carneipes	Flesh-footed Shearwater	Vulnerable	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Ardenna grisea	Sooty Shearwater	Not Listed	Not Sensitive	Not Listed	CAMBA;JAMBA
Animalia	Aves	Ardenna pacificus	Wedge-tailed Shearwater	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Ardenna tenuirostris	Short-tailed Shearwater	Not Listed	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Arenaria interpres	Ruddy Turnstone	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Artamus cyanopterus cyanopterus	Dusky Woodswallow	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Botaurus poiciloptilus	Australasian Bittern	Endangered	Not Sensitive	Endangered	
Animalia	Aves	Burhinus grallarius	Bush Stone-curlew	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Calamanthus fuliginosus	Striated Fieldwren	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Calidris acuminata	Sharp-tailed Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Calidris alba	Sanderling	Vulnerable	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Calidris bairdii	Baird's Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Calidris canutus	Red Knot	Not Listed	Not Sensitive	Endangered	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Calidris ferruginea	Curlew Sandpiper	Endangered	Not Sensitive	Critically Endangered	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Calidris melanotos	Pectoral Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Calidris ruficollis	Red-necked Stint	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Calidris subminuta	Long-toed Stint	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Calidris tenuirostris	Great Knot	Vulnerable	Not Sensitive	Critically Endangered	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Callocephalon fimbriatum	Gang-gang Cockatoo	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Calyptorhynchus lathami	Glossy Black-Cockatoo	Vulnerable	Category 2	Not Listed	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Charadrius leschenaultii	Greater Sand-plover	Vulnerable	Not Sensitive	Vulnerable	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Charadrius mongolus	Lesser Sand-plover	Vulnerable	Not Sensitive	Endangered	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Charadrius veredus	Oriental Plover	Not Listed	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Chlidonias leucopterus	White-winged Black Tern	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Circus assimilis	Spotted Harrier	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Daphoenositta chrysoptera	Varied Sittella	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Dasyornis brachypterus	Eastern Bristlebird	Endangered	Category 2	Endangered	
Animalia	Aves	Diomedea exulans	Wandering Albatross	Endangered	Not Sensitive	Endangered	JAMBA
Animalia	Aves	Diomedea gibsoni	Gibson's Albatross	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Aves	Egretta sacra	Eastern Reef Egret	Not Listed	Not Sensitive	Not Listed	CAMBA
Animalia	Aves	Epthianura albifrons	White-fronted Chat	Endangered Population, Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Erythrotriorchis radiatus	Red Goshawk	Critically Endangered	Category 2	Vulnerable	
Animalia	Aves	Esacus magnirostris	Beach Stone-curlew	Critically Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Falco subniger	Black Falcon	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Fregata ariel	Lesser Frigatebird	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Gallinago hardwickii	Latham's Snipe	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Gelochelidon nilotica	Gull-billed Tern	Not Listed	Not Sensitive	Not Listed	CAMBA
Animalia	Aves	Gygis alba	White Tern	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Haematopus fuliginosus	Sooty Oystercatcher	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Haematopus longirostris	Pied Oystercatcher	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Haliaeetus leucogaster	White-bellied Sea-Eagle	Vulnerable	Not Sensitive	Not Listed	CAMBA
Animalia	Aves	Hieraaetus morphnoides	Little Eagle	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Hirundapus caudacutus	White-throated Needletail	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Hydroprogne caspia	Caspian Tern	Not Listed	Not Sensitive	Not Listed	CAMBA;JAMBA
Animalia	Aves	Ixobrychus flavicollis	Black Bittern	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Lathamus discolor	Swift Parrot	Endangered	Category 3	Critically Endangered	
Animalia	Aves	Limicola falcinellus	Broad-billed Sandpiper	Vulnerable	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Limosa lapponica	Bar-tailed Godwit	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Limosa limosa	Black-tailed Godwit	Vulnerable	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Lophochroa leadbeateri	Major Mitchell's Cockatoo	Vulnerable	Category 2	Not Listed	
Animalia	Aves	Lophoictinia isura	Square-tailed Kite	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Macronectes giganteus	Southern Giant Petrel	Endangered	Not Sensitive	Endangered	
Animalia	Aves	Macronectes halli	Northern Giant-Petrel	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Aves	Merops ornatus	Rainbow Bee-eater	Not Listed	Not Sensitive	Not Listed	JAMBA

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Motacilla citreola	Citrine Wagtail	Not Listed	Not Sensitive	Not Listed	CAMBA
Animalia	Aves	Neochmia ruficauda	Star Finch	Presumed Extinct	Not Sensitive	Endangered	
Animalia	Aves	Neophema chrysogaster	Orange-bellied Parrot	Critically Endangered	Category 3	Critically Endangered	
Animalia	Aves	Neophema pulchella	Turquoise Parrot	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Ninox strenua	Powerful Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Numenius madagascariensis	Eastern Curlew	Not Listed	Not Sensitive	Critically Endangered	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Numenius minutus	Little Curlew	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Numenius phaeopus	Whimbrel	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Onychoprion fuscata	Sooty Tern	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Oxyura australis	Blue-billed Duck	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Pandion cristatus	Eastern Osprey	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Petroica boodang	Scarlet Robin	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Petroica phoenicea	Flame Robin	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Pezoporus wallicus wallicus	Eastern Ground Parrot	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Philomachus pugnax	Ruff	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Plegadis falcinellus	Glossy Ibis	Not Listed	Not Sensitive	Not Listed	CAMBA
Animalia	Aves	Pluvialis fulva	Pacific Golden Plover	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Pluvialis squatarola	Grey Plover	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Polytelis swainsonii	Superb Parrot	Vulnerable	Category 3	Vulnerable	
Animalia	Aves	Procelsterna cerulea	Grey Ternlet	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Pterodroma neglecta neglecta	Kermadec Petrel (west Pacific subspecies)	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Aves	Ptilinopus regina	Rose-crowned Fruit-Dove	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ptilinopus superbus	Superb Fruit-Dove	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Rostratula australis	Australian Painted Snipe	Endangered	Not Sensitive	Endangered	
Animalia	Aves	Stagonopleura guttata	Diamond Firetail	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Stercorarius parasiticus	Arctic Jaeger	Not Listed	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Sterna hirundo	Common Tern	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Sternula albifrons	Little Tern	Endangered	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Stictonetta naevosa	Freckled Duck	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Sula leucogaster	Brown Booby	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Thalassarche cauta	Shy Albatross	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Aves	Thalassarche melanophris	Black-browed Albatross	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Aves	Tringa brevipes	Grey-tailed Tattler	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Tringa glareola	Wood Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Tringa incana	Wandering Tattler	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Tringa nebularia	Common Greenshank	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Tringa stagnatilis	Marsh Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Tryngites subruficollis	Buff-breasted Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Tyto novaehollandiae	Masked Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Xenus cinereus	Terek Sandpiper	Vulnerable	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Mammalia	Arctocephalus forsteri	New Zealand Fur-seal	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Arctocephalus pusillus doriferus	Australian Fur-seal	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Dasyurus viverrinus	Eastern Quoll	Endangered	Not Sensitive	Endangered	
Animalia	Mammalia	Dugong dugon	Dugong	Endangered	Not Sensitive	Not Listed	
Animalia	Mammalia	Eubalaena australis	Southern Right Whale	Endangered	Not Sensitive	Endangered	
Animalia	Mammalia	Megaptera novaeangliae	Humpback Whale	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	Miniopterus australis	Little Bentwing-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Myotis macropus	Southern Myotis	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Perameles nasuta	Long-nosed Bandicoot	Endangered Population	Not Sensitive	Not Listed	
Animalia	Mammalia	Phascolarctos cinereus	Koala	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Scoteanax rueppellii	Greater Broad-nosed Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Reptilia	Caretta caretta	Loggerhead Turtle	Endangered	Not Sensitive	Endangered	
Animalia	Reptilia	Chelonia mydas	Green Turtle	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Reptilia	Eretmochelys imbricata	Hawksbill Turtle	Not Listed	Not Sensitive	Vulnerable	
Plantae	Flora	Acacia bynoeana	Bynoe's Wattle	Endangered	Not Sensitive	Vulnerable	
Plantae	Flora	Acacia gordonii		Endangered	Not Sensitive	Endangered	
Plantae	Flora	Acacia prominens	Gosford Wattle	Endangered Population	Not Sensitive	Not Listed	
Plantae	Flora	Acacia pubescens	Downy Wattle	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Acacia terminalis subsp. terminalis	Sunshine Wattle	Endangered	Not Sensitive	Endangered	
Plantae	Flora	Caladenia tessellata	Thick Lip Spider Orchid	Endangered	Category 2	Vulnerable	
Plantae	Flora	Callistemon linearifolius	Netted Bottle Brush	Vulnerable	Category 3	Not Listed	
Plantae	Flora	Dichanthium setosum	Bluegrass	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Eucalyptus fracta	Broken Back Ironbark	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Eucalyptus leucoxylon subsp. pruinosa	Yellow Gum	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Eucalyptus nicholii	Narrow-leaved Black Peppermint	Vulnerable	Not Sensitive	Vulnerable	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Plantae	Flora	Eucalyptus pulverulenta	Silver-leafed Gum	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Eucalyptus scoparia	Wallangarra White Gum	Endangered	Not Sensitive	Vulnerable	
Plantae	Flora	Hibbertia puberula		Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Macadamia integrifolia	Macadamia Nut	Not Listed	Not Sensitive	Vulnerable	
Plantae	Flora	Macadamia tetraphylla	Rough-shelled Bush Nut	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Maundia triglochinoides		Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Melaleuca deanei	Deane's Paperbark	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Persoonia hirsuta	Hairy Geebung	Endangered	Category 3	Endangered	
Plantae	Flora	Pomaderris prunifolia	Plum-leaf Pomaderris	Endangered Population	Not Sensitive	Not Listed	
Plantae	Flora	Prostanthera marifolia	Seaforth Mintbush	Critically Endangered	Category 3	Critically Endangered	
Plantae	Flora	Senecio spathulatus	Coast Groundsel	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Senna acclinis	Rainforest Cassia	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Syzygium paniculatum	Magenta Lilly Pilly	Endangered	Not Sensitive	Vulnerable	
Plantae	Flora	Tetratheca juncea	Black-eyed Susan	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Thesium australe	Austral Toadflax	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Tinospora tinosporoides	Arrow-head Vine	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Wilsonia backhousei	Narrow-leafed Wilsonia	Vulnerable	Not Sensitive	Not Listed	

Data does not include NSW category 1 sensitive species.
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Data obtained 01/11/2018

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APPENDIX

D

ANALYTICAL SUMMARY TABLES

				BTEX							TRH				
				Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.1	0.1	0.1	0.2	0.1	0.3	0.2	20	20	50	50	50
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m															
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs				50	85	70			105			120			
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m				1100	120,000	85,000			130,000						
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs															
NEPM 2013 HIL, Residential A															
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand															
0-1m				0.5	160	55			40						
1-2m				0.5	220	NL			60						
2-4m				0.5	310	NL			95						
>4m				0.5	540	NL			170						
Site	**Location**	**Field ID**	**Sample Date**												
Kyeemagh Infants School		TP01_0.2	10/11/2018	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	62	62
		TP01_0.9		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP02_0.1		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	63	110	173
		TP02_0.4		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP03_0.2		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP03_1.2		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP04_0.1		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP05_0.1		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP05_0.9		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP06_0.1		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	100	480	580
		TP06_0.3		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP07_0.1		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP07_0.4		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP07_0.6		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP08_0.4		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP09_0.3		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP10_0.1		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	91	91
		TP11_0.2		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP11_1.2		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	72	92	164
		TP12_0.2		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP13_0.1	17/11/2018	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	70	290	360
		TP13_0.4		-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.1		-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.7		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP15_0.1		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP15_0.6		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP16_0.1		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP16_0.8		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP17_0.1		-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.5		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP18_0.1		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP18_0.4		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP19_0.1	10/11/2018	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP19_0.3		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP20_0.1	17/11/2018	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		BH02_0.5		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		BH2_1.0		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		BH03_0.5		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		BH4_0.4	10/11/2018	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	370	1600	1970
		BH05_0.2-0.5		<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
		TP03_ASB1		-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.4		-	-	-	-	-	-	-	-	-	-	-	-
		ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
	TP12_0.2	QA200		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50
	TP16_0.1	QA300	17/11/2018	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50
	TP16_0.1	QA400		<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50

Statistical Summary

Maximum Concentration	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<20	<50	370	1600	1970
Average Concentration	0.052	0.06	0.06	0.11	0.06	0.15	<0.2	<20	<50	40	88	104
Standard Deviation	0.011	0.044	0.044	0.033	0.044	0.022		1	3	55	256	316

				CRC Care TRH Fractions							MAH									
				C6-C10	C10-C16	C16-C34	C34-C40	C10 - C40 (Sum of total)	F1: C6-C10 less BTEX	F2: >C10-C16 less Naphthalene	Total MAH	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				20	50	100	100	100	20	50	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m																				
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs					120	300	2800		180											
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m				82,000	62,000	85,000	120,000													
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs																				
NEPM 2013 HIL, Residential A																				
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																				
0-1m									45	110										
1-2m									70	240										
2-4m									110	440										
>4m									200	NL										
Site	**Location**	**Field ID**	**Sample Date**																	
Kyeemagh Infants School		TP01_0.2	10/11/2018	<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP01_0.9		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP02_0.1		<20	<50	130	<100	130	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP02_0.4		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP03_0.2		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP03_1.2		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP04_0.1		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP05_0.1		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP05_0.9		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP06_0.1		<20	<50	350	520	870	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP06_0.3		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP07_0.1		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP07_0.4		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP07_0.6		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP08_0.4		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP09_0.3		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP10_0.1		<20	<50	<100	150	150	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP11_0.2		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP11_1.2		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP12_0.2		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP13_0.1	17/11/2018	<20	<50	270	240	510	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP13_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.7		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP15_0.1		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP15_0.6		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP16_0.1		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP16_0.8		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP17_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.5		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP18_0.1		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP18_0.4		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP19_0.1	10/11/2018	<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP19_0.3		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		TP20_0.1	17/11/2018	<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		BH02_0.5		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		BH2_1.0		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		BH03_0.5		<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
		BH4_0.4	10/11/2018	<20	<50	1200	940	2140	<20	<50	-	-	-	-	-	-	-	-	-	-
		BH05_0.2-0.5		<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
		TP03_ASB1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	<20	<50	<100	<100	<100	<20	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
	TP12_0.2	QA200		<10	<50	<100	<100	<50	<10	<50	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP16_0.1	QA300	17/11/2018	<20	<50	<100	<100	<100	<20	<50	-	-	-	-	-	-	-	-	-	-
	TP16_0.1	QA400		<10	<50	<100	<100	<50	<10	<50	-	-	-	-	-	-	-	-	-	-
Statistical Summary																				
Maximum Concentration				<20	<50	1200	940	2140	<20	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Average Concentration				<20	<50	93	90	135	<20	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Standard Deviation				1	0	187	158	353	1	0	0	0	0	0					0	

				PAH																			
				Benzo(a)pyrene TEQ (half LOR)_	Benzo(a)pyrene TEQ (upper bound) *	Benzo(b+j)fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	BaP TEQ (zero)	Benzo(a)pyrene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Sum of total)	Phenanthrene	Pyrene
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m																				170			
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs												20											
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m																				29,000			
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs																							
NEPM 2013 HIL, Residential A				3																	300		
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																							
0-1m																				3			
1-2m																				NL			
2-4m																				NL			
>4m																				NL			
Site	**Location**	**Field ID**	**Sample Date**																				
Kyeemagh Infants School	TP01_0.2		10/11/2018	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP01_0.9			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP02_0.1			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP02_0.4			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP03_0.2			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP03_1.2			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP04_0.1			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP05_0.1			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP05_0.9			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP06_0.1			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP06_0.3			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP07_0.1			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP07_0.4			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP07_0.6			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP08_0.4			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP09_0.3			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP10_0.1			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP11_0.2			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP11_1.2			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP12_0.2			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP13_0.1		17/11/2018	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP13_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP14_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP14_0.7			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP15_0.1			1.2	1.5	<0.5	<0.5	<0.5	<0.5	1.1	0.9	0.7	<0.5	0.7	1	<0.5	1.3	<0.5	<0.5	<0.5	6.9	0.8	1.3
	TP15_0.6			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP16_0.1			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP16_0.8			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP17_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP17_0.5			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP18_0.1			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP18_0.4			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP19_0.1		10/11/2018	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP19_0.3			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP20_0.1		17/11/2018	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	BH02_0.5			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	BH2_1.0			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	BH03_0.5			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	BH4_0.4		10/11/2018	1.3	1.7	0.6	<0.5	<0.5	<0.5	<0.5	1	0.9	<0.5	0.8	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	3.4	<0.5	0.5
	BH05_0.2-0.5			0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP03_ASB1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP04_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ASB2		17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP12_0.2	QA200		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP16_0.1	QA300	17/11/2018	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP16_0.1	QA400		0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Statistical Summary

Maximum Concentration	1.3	1.7	0.6	<0.5	<0.5	<0.5	1.1	1	0.9	<0.5	0.8	1	<0.5	1.3	<0.5	<0.5	<0.5	6.9	0.8	1.3
Average Concentration	0.6	1.2	0.3	<0.5	<0.5	<0.5	0.3	0.3	0.3	<0.5	0.3	0.3	<0.5	0.3	<0.5	<0.5	<0.5	0.5	0.3	0.3
Standard Deviation	0.1	0.1	0.1	0	0	0	0.1	0.2	0.1	0	0.1	0.1	0	0.2	0	0	0	1.1	0.1	0.2

Site	Location	Field ID	Sample Date	Asbestos			Metals								
				Asbestos from ACM in Soil (Y/N)	Asbestos from FA & AF in Soil (Y/N)	Detected (Y) / Not Detected (N)	Arsenic	Cadmium	Chromium (III+VI)	Copper	Iron	Lead	Mercury	Nickel	Zinc
				%w/w	%w/w	Comment	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR							2	0.4	5	5	20	5	0.1	5	5
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m							100		160	60		1100		8	230
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs															
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m															
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs				0.01	0.001										
NEPM 2013 HIL, Residential A							100	20		6000		300	40	400	7400
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand															
0-1m															
1-2m															
2-4m															
>4m															
Site	**Location**	**Field ID**	**Sample Date**												
Kyeemagh Infants School	TP01_0.2		10/11/2018	N	N	N	<2	<0.4	8.8	27	-	19	<0.1	15	44
	TP01_0.9			-	-	-	<2	<0.4	<5	<5	-	18	<0.1	<5	20
	TP02_0.1			N	N	N	<2	<0.4	18	9.4	-	35	0.7	15	72
	TP02_0.4			N	N	N	<2	<0.4	10	6.8	-	8.1	<0.1	9.6	27
	TP03_0.2			N	N	N	<2	<0.4	<5	6.6	-	19	<0.1	<5	35
	TP03_1.2			N	N	N	<2	<0.4	<5	<5	-	6.2	<0.1	<5	11
	TP04_0.1			N	N	N	<2	<0.4	<5	8.7	-	38	<0.1	<5	36
	TP05_0.1			N	N	N	<2	<0.4	<5	5.2	-	23	<0.1	<5	23
	TP05_0.9			-	-	-	<2	<0.4	<5	<5	360	<5	<0.1	<5	<5
	TP06_0.1			N	N	N	2.8	<0.4	130	37	-	8.1	<0.1	130	86
	TP06_0.3			-	-	-	<2	<0.4	13	16	-	11	<0.1	17	26
	TP07_0.1			N	N	N	2.5	<0.4	6.4	8.4	-	17	1.5	<5	46
	TP07_0.4			-	-	-	<2	<0.4	<5	<5	1500	11	0.2	<5	15
	TP07_0.6			-	-	-	<2	<0.4	<5	13	-	9	0.7	<5	20
	TP08_0.4			-	-	-	<2	<0.4	<5	<5	-	7.3	<0.1	<5	10
	TP09_0.3			N	N	N	<2	<0.4	<5	<5	-	10	<0.1	<5	14
	TP10_0.1			-	-	-	<2	<0.4	<5	<5	-	10	<0.1	<5	21
	TP11_0.2			N	N	N	<2	<0.4	<5	<5	-	<5	<0.1	<5	<5
	TP11_1.2			-	-	-	<2	<0.4	<5	<5	-	19	<0.1	<5	12
	TP12_0.2			N	N	N	<2	<0.4	<5	<5	630	13	<0.1	<5	17
	TP13_0.1		17/11/2018	N	N	N	<2	<0.4	32	12	-	11	<0.1	30	40
	TP13_0.4			N	N	N	-	-	-	-	-	-	-	-	-
	TP14_0.1			N	N	N	-	-	-	-	-	-	-	-	-
	TP14_0.7			-	-	-	<2	<0.4	<5	<5	-	<5	<0.1	<5	<5
	TP15_0.1			-	-	-	<2	<0.4	<5	16	-	65	0.1	<5	43
	TP15_0.6			-	-	-	<2	<0.4	<5	<5	-	<5	<0.1	<5	120
	TP16_0.1			-	-	-	<2	<0.4	<5	<5	-	17	<0.1	<5	18
	TP16_0.8			-	-	-	<2	<0.4	<5	<5	-	5.1	<0.1	<5	8.3
	TP17_0.1			N	N	N	-	-	-	-	-	-	-	-	-
	TP17_0.5			-	-	-	<2	<0.4	<5	<5	-	<5	<0.1	<5	<5
	TP18_0.1			N	N	N	<2	<0.4	<5	11	-	56	<0.1	<5	130
	TP18_0.4			-	-	-	<2	<0.4	<5	<5	-	<5	<0.1	<5	<5
	TP19_0.1		10/11/2018	N	N	N	<2	<0.4	<5	7.3	-	32	<0.1	<5	29
	TP19_0.3			N	N	N	<2	<0.4	<5	10	-	10	<0.1	<5	25
	TP20_0.1		17/11/2018	N	N	N	<2	<0.4	5.3	12	-	42	<0.1	<5	66
	BH02_0.5			N	N	N	<2	<0.4	<5	<5	-	9.8	<0.1	<5	17
	BH2_1.0			-	-	-	<2	<0.4	<5	5.6	-	12	<0.1	<5	24
	BH03_0.5			N	N	N	<2	<0.4	<5	<5	-	7	<0.1	<5	6.8
	BH4_0.4		10/11/2018	-	-	-	<2	<0.4	<5	11	-	13	<0.1	13	25
	BH05_0.2-0.5			-	-	-	<2	<0.4	<5	<5	-	<5	<0.1	<5	<5
	TP03_ASB1			N	N	Y	-	-	-	-	-	-	-	-	-
	TP04_0.4			0.1908	N	Y	-	-	-	-	-	-	-	-	-
	ASB2		17/11/2018	N	N	Y	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	-	-	-	<2	<0.4	<5	11	-	14	<0.1	<5	15
	TP12_0.2	QA200		-	-	-	<5	<1	<2	<5	-	8	<0.1	<2	10
	TP16_0.1	QA300	17/11/2018	-	-	-	<2	<0.4	<5	5.2	-	19	<0.1	<5	20
	TP16_0.1	QA400		-	-	-	<5	<1	<2	5	-	21	<0.1	<2	22

Statistical Summary

Maximum Concentration	0.1908	0	0	<5	<1	130	37	1500	65	1.5	130	130
Average Concentration				<5	<1	7.4	7.2	830	16	0.1	7.6	29
Standard Deviation				0.5	0.1	20	7.1	596	14	0.3	20	29

Soil Analytical Summary
Kyeemagh Infant School
Project: 80818157

DWP Architects
Pyrmont NSW

	Inorganics								VOCs			Organic	SVOCs
	% Clay*	Iron (%)	Conductivity (1:5 aqueous extract)	CEC	pH (Lab)	pH (Field)	pH (Fox)	Reaction Ratings	cis-1,4-Dichloro-2-butene	Pentachloroethane	trans-1,4-Dichloro-2-butene	TOC	EPN
	%	%	US/CM	meq/100g	pH_Units	PH UNITS	pH Unit	COMMENT	mg/kg	mg/kg	mg/kg	%	mg/kg
LOR	1	0.01	10	0.05	0.1	0.1	0.1		0.5	0.5	0.5	0.1	0.2
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m													
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs													
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m													
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs													
NEPM 2013 HIL, Residential A													
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand													
0-1m													
1-2m													
2-4m													
>4m													

Site	Location	Field ID	Sample Date	% Clay*	Iron (%)	Conductivity (1:5 aqueous extract)	CEC	pH (Lab)	pH (Field)	pH (Fox)	Reaction Ratings	cis-1,4-Dichloro-2-butene	Pentachloroethane	trans-1,4-Dichloro-2-butene	TOC	EPN
Kyeemagh Infants School		TP01_0.2	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP01_0.9		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP02_0.1		-	-	-	-	-	-	-	-	-	-	-	-	<0.2
		TP02_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_0.2		-	-	-	-	-	-	-	-	-	-	-	-	<0.2
		TP03_1.2		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.1		-	-	-	-	-	-	-	-	-	-	-	-	<0.2
		TP05_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP05_0.9		<1	0.04	12	0.76	5.9	-	-	-	-	-	-	0.1	-
		TP06_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP06_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.4		<1	0.15	58	2.8	5.8	-	-	-	-	-	-	0.6	-
		TP07_0.6		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP08_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP09_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP10_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP11_0.2		-	-	-	-	-	-	-	-	-	-	-	-	<0.2
		TP11_1.2		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP12_0.2		<1	0.06	31	1.9	5.9	-	-	-	-	-	-	0.7	<0.2
		TP13_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	<0.2
		TP13_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.7		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.6		-	-	-	-	-	-	-	-	-	-	-	-	<0.2
		TP16_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP16_0.8		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP18_0.1		-	-	-	-	-	-	-	-	-	-	-	-	<0.2
		TP18_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP20_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	<0.2
		BH02_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-
		BH2_1.0		-	-	-	-	-	-	-	-	-	-	-	-	-
		BH03_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-
		BH4_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH05_0.2-0.5		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_ASB1		-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-
		ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	<0.2
	TP12_0.2	QA200		-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	-	-
	TP16_0.1	QA300	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.1	QA400		-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary

	% Clay*	Iron (%)	Conductivity (1:5 aqueous extract)	CEC	pH (Lab)	pH (Field)	pH (Fox)	Reaction Ratings	cis-1,4-Dichloro-2-butene	Pentachloroethane	trans-1,4-Dichloro-2-butene	TOC	EPN
Maximum Concentration	<1	0.15	58	2.8	5.9	0	0	0	<0.5	<0.5	<0.5	0.7	<0.2
Average Concentration	<1	0.08	34	1.8	5.9				<0.5	<0.5	<0.5	0.5	<0.2
Standard Deviation	0	0.06	23	1	0.1							0.3	0

				Chlorinated Hydrocarbons													
				Vic EPA IWRG 621 CHC (Total)*	Vic EPA IWRG 621 Other CHC (Total)*	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane
				MG/KG	MG/KG	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m																	
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs																	
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m																	
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs																	
NEPM 2013 HIL, Residential A																	
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																	
0-1m																	
1-2m																	
2-4m																	
>4m																	
Site	**Location**	**Field ID**	**Sample Date**														
Kyeemagh Infants School		TP01_0.2	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP01_0.9		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP02_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP02_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_0.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_1.2		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
		TP04_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP05_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP05_0.9		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
		TP06_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP06_0.3		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
		TP07_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.6		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP08_0.4		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
		TP09_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP10_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP11_0.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP11_1.2		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
		TP12_0.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP13_0.1	17/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
		TP13_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.7		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
		TP15_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.6		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
		TP16_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP16_0.8		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
		TP17_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
		TP18_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP18_0.4		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
		TP19_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP20_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH02_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH2_1.0		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
		BH03_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH4_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH05_0.2-0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
		TP03_ASB1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
	TP12_0.2	QA200		-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP16_0.1	QA300	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.1	QA400		-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary

Maximum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Average Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Standard Deviation	0	0	0	0	0	0	0	0		0		0	0	0

Site	Location	Field ID	Sample Date	Chlorinated Hydrocarbons																		
				2,2-dichloropropane	Bromochloromethane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Dibromomethane	Dichloromethane	Hexachlorobutadiene	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m																						
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs																						
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m																						
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs																						
NEPM 2013 HIL, Residential A																						
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																						
0-1m																						
1-2m																						
2-4m																						
>4m																						
Kyeemagh Infants School	TP01_0.2		10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP01_0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP02_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP02_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP03_0.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP03_1.2			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP04_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP05_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP05_0.9			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP06_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP06_0.3			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP07_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP07_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP07_0.6			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP08_0.4			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP09_0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP10_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP11_0.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP11_1.2			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP12_0.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP13_0.1		17/11/2018	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP13_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP14_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP14_0.7			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP15_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP15_0.6			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP16_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.8			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP17_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP17_0.5			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP18_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP18_0.4			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP19_0.1		10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP19_0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP20_0.1		17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH02_0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH2_1.0			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	BH03_0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH4_0.4		10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH05_0.2-0.5			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP03_ASB1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP04_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ASB2		17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
	TP12_0.2	QA200		<0.5	-	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5
	TP16_0.1	QA300	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.1	QA400		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary

Maximum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Average Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Standard Deviation		0	0	0	0	0	1	0	1	0	0	0	0		0	0	0	0	1

Site	Location	Field ID	Sample Date	Halogenated Hydrocarbons													
				1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dibromoethane	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Bromomethane	Chlorobenzene	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m																	
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs																	
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m																	
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs																	
NEPM 2013 HIL, Residential A																	
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																	
0-1m																	
1-2m																	
2-4m																	
>4m																	
Kyeemagh Infants School		TP01_0.2	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP01_0.9		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP02_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP02_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_0.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_1.2		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP04_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP05_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP05_0.9		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP06_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP06_0.3		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP07_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.6		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP08_0.4		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP09_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP10_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP11_0.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP11_1.2		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP12_0.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP13_0.1	17/11/2018	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP13_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.7		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP15_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.6		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP16_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP16_0.8		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP17_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.5		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP18_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP18_0.4		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP19_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP20_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH02_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH2_1.0		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		BH03_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH4_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH05_0.2-0.5		-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
		TP03_ASB1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TP12_0.2	QA200		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<5	<0.5	<5
	TP16_0.1	QA300	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.1	QA400		-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary

Maximum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<5	<0.5	<5
Average Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<5	<0.5	<5
Standard Deviation			0	0	0	0		0	0	1	0	1	0	1

				Organochlorine Pesticides													
				Vic EPA IWRG 621 OCP (Total)*	Vic EPA IWRG 621 Other OCP (Total)*	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD
				MG/KG	MG/KG	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.1	0.1	0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m																180	
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs																	
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m																	
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs																	
NEPM 2013 HIL, Residential A									6		50						240
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																	
0-1m																	
1-2m																	
2-4m																	
>4m																	
Site	**Location**	**Field ID**	**Sample Date**														
Kyeemagh Infants School		TP01_0.2	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP01_0.9		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP02_0.1		1.46	0.7	0.06	<0.05	<0.05	0.64	<0.05	0.7	-	-	<0.05	<0.05	0.06	0.12
		TP02_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_0.2		<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05
		TP03_1.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.1		<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05
		TP05_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP05_0.9		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP06_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP06_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.6		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP08_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP09_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP10_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP11_0.2		<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05
		TP11_1.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP12_0.2		<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05
		TP13_0.1	17/11/2018	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05
		TP13_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.7		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.6		<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05
		TP16_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP16_0.8		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP18_0.1		<0.1	<0.1	<0.05	<0.05	<0.05	0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05
		TP18_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP20_0.1	17/11/2018	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05
		BH02_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH2_1.0		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH03_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH4_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH05_0.2-0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_ASB1		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05	<0.05	<0.05	<0.05
	TP12_0.2	QA200		-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05
	TP16_0.1	QA300	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.1	QA400		-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary

Maximum Concentration	1.5	0.7	0.06	<0.05	<0.05	0.64	<0.05	0.7	<0.05	<0.05	<0.05	<0.05	<0.2	0.12
Average Concentration	0.2	0.1	0.03	<0.05	<0.05	0.08	<0.05	0.1	<0.05	<0.05	<0.05	<0.05	<0.2	0.03
Standard Deviation	0.5	0.2	0.01	0	0	0.18	0	0.2			0	0	0	0.03

				Organochlorine Pesticides													
				Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	1
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m																	
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs																	
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m																	
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs																	
NEPM 2013 HIL, Residential A					270				10				6		10	300	20
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																	
0-1m																	
1-2m																	
2-4m																	
>4m																	
Site	**Location**	**Field ID**	**Sample Date**														
Kyeemagh Infants School	TP01_0.2		10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP01_0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP02_0.1			0.64	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
	TP02_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP03_0.2			<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
	TP03_1.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP04_0.1			<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
	TP05_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP05_0.9			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP06_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP06_0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP07_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP07_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP07_0.6			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP08_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP09_0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP10_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP11_0.2			<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
	TP11_1.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2			<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
	TP13_0.1		17/11/2018	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
	TP13_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP14_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP14_0.7			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP15_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP15_0.6			<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
	TP16_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.8			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP17_0.1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP17_0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP18_0.1			0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
	TP18_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP19_0.1		10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP19_0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP20_0.1		17/11/2018	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
	BH02_0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH2_1.0			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH03_0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH4_0.4		10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BH05_0.2-0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP03_ASB1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP04_0.4			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ASB2		17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
	TP12_0.2	QA200		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	-
	TP16_0.1	QA300	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.1	QA400		-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary

Maximum Concentration				0.64	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
Average Concentration				0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
Standard Deviation				0.18		0	0	0	0	0	0	0	0	0	0	0	0

	Tokuthion	Azinophos methyl	Bolstar (Sulprofos)	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S	Diazinon	Dichlorvos	Dimethoate	Disulfoton	Ethion	Ethoprop
	Organophosphorous Pesticides																
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR	0.2	0.2	0.2	0.05	0.05	0.2	0.2	0.2	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m																	
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs																	
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m																	
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs																	
NEPM 2013 HIL, Residential A							160										
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																	
0-1m																	
1-2m																	
2-4m																	
>4m																	

Site	Location	Field ID	Sample Date	Tokuthion	Azinophos methyl	Bolstar (Sulprofos)	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S	Diazinon	Dichlorvos	Dimethoate	Disulfoton	Ethion	Ethoprop
Kyeemagh Infants School		TP01_0.2	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP01_0.9		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP02_0.1		<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
		TP02_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_0.2		<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
		TP03_1.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.1		<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
		TP05_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP05_0.9		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP06_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP06_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.6		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP08_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP09_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP10_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP11_0.2		<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
		TP11_1.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP12_0.2		<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
		TP13_0.1	17/11/2018	<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
		TP13_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.7		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.6		<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
		TP16_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP16_0.8		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP18_0.1		<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
		TP18_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP20_0.1	17/11/2018	<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
		BH02_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH2_1.0		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH03_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH4_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH05_0.2-0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_ASB1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	TP12_0.2	QA200		-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	<0.05	<0.05	<0.05	-	<0.05	-
	TP16_0.1	QA300	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.1	QA400		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary

	Tokuthion	Azinophos methyl	Bolstar (Sulprofos)	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S	Diazinon	Dichlorvos	Dimethoate	Disulfoton	Ethion	Ethoprop
Maximum Concentration	<0.2	<0.2	<0.2	<0.05	<0.05	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Average Concentration	<0.2	<0.2	<0.2	<0.05	<0.05	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Standard Deviation	0	0	0			0	0	0	0	0	0	0	0	0	0	0	0

				Organophosphorous Pesticides																
				Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Phorate	Prothiofos	Pyrazophos	Ronnel	Terbufos	Trichloronate	Tetrachlorvinphos
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.2	0.2	0.2	0.2	0.2	0.2	0.2	2	0.2	2	0.2	0.05	0.2	0.2	0.2	0.2	0.2
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m																				
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs																				
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m																				
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs																				
NEPM 2013 HIL, Residential A																				
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																				
0-1m																				
1-2m																				
2-4m																				
>4m																				
Site	**Location**	**Field ID**	**Sample Date**																	
Kyeemagh Infants School		TP01_0.2	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP01_0.9		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP02_0.1		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
		TP02_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
		TP03_1.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.1		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
		TP05_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP05_0.9		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP06_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP06_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.6		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP08_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP09_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP10_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP11_0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
		TP11_1.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP12_0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
		TP13_0.1	17/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
		TP13_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.7		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.6		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
		TP16_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP16_0.8		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP18_0.1		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
		TP18_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP20_0.1	17/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
		BH02_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH2_1.0		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH03_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH4_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH05_0.2-0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_ASB1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
	TP12_0.2	QA200		-	-	<0.05	<0.05	-	<0.2	-	<0.2	-	-	-	<0.05	-	-	-	-	-
	TP16_0.1	QA300	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.1	QA400		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary

Maximum Concentration	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.05	<0.2	<0.2	<0.2	<0.2	<0.2
Average Concentration	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.05	<0.2	<0.2	<0.2	<0.2	<0.2
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0

				Solvents							Pesticides					Polychlorinated Biphenyls							
				Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Acetone	Allyl chloride	Carbon disulfide	Vinyl acetate	Demeton-S-methyl	Fenamiphos	Parathion	Pirimiphos-methyl	Pirimphos-ethyl	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Sum of total)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR				0.5	5	0.5	0.5	0.5	0.5	5	0.05	0.05	0.2	0.2	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged 0-2m																							
NEPM 2013 ESL UR/POS, Coarse Soil 0-2m / CCME 2010 SQGs																							
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m																							
NEPM 2013 Schedule B1 Table 7 Asbestos HSLs																							
NEPM 2013 HIL, Residential A																							1
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																							
0-1m																							
1-2m																							
2-4m																							
>4m																							

Site	Location	Field ID	Sample Date																				
Kyeemagh Infants School		TP01_0.2	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP01_0.9		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP02_0.1		-	-	-	-	-	-	-	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		TP02_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_0.2		-	-	-	-	-	-	-	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		TP03_1.2		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.1		-	-	-	-	-	-	-	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		TP05_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP05_0.9		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP06_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP06_0.3		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP07_0.6		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP08_0.4		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP09_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP10_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP11_0.2		-	-	-	-	-	-	-	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		TP11_1.2		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP12_0.2		-	-	-	-	-	-	-	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		TP13_0.1	17/11/2018	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		TP13_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP14_0.7		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP15_0.6		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		TP16_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP16_0.8		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP17_0.5		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP18_0.1		-	-	-	-	-	-	-	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		TP18_0.4		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP19_0.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP20_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		BH02_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH2_1.0		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH03_0.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH4_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH05_0.2-0.5		<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP03_ASB1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TP04_0.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP12_0.2	QA100	10/11/2018	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	TP12_0.2	QA200		<5	<5	<5	-	-	<0.5	<5	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1
	TP16_0.1	QA300	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TP16_0.1	QA400		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary

Maximum Concentration	<5	<5	<5	<0.5	<0.5	<0.5	<5	<0.05	<0.05	<0.2	<0.2	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Average Concentration	<5	<5	<5	<0.5	<0.5	<0.5	<5	<0.05	<0.05	<0.2	<0.2	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Standard Deviation	1		1	0	0	0				0	0		0	0	0	0	0	0	0	0

Cardno

SPOCAS SOIL ANALYTICAL SUMMARY
Kyeemagh Infant School
Project: 59918157

DWP Australa
Kyeemagh NSW

Location	Depth (m)	Date Sampled	Filling (F) / Natural (N)	Material Type	pH_F	pH_{FOX}	pH_F - pH_{FOX}	Reaction Rate	pH kcl	Peroxide pH	TPA	TSA	Peroxide Oxidisable Sulfur	Chromium Reducible Sulfur	Acid Neutralising Capacity	Acid Trail	Net Acidity	Liming rate
					pH units	pH units	pH units		pH units	pH Units	mol H+/t	mol H+/t	%S	%S	%S	TAA Mole H+/t	%S	kg $CaCO_3$/t
BH01_1.0-1.45	1.0-1.45	10/11/2018	F	Silty Sand	6.4	4.2	2.2	1	5.8	4.8	<2	<0.02	<0.02	<0.005	n/a	3	<0.02	<1
BH01_2.5-2.95	2.5-2.95	10/11/2018	N	Silty Sand	6.3	4.8	1.5	1	-	-	-	-	-	-	-	-	-	-
BH01_3.0-3.45	3.0-3.45	10/11/2018	N	Silty Sand	7.1	5.7	1.4	1	-	-	-	-	-	-	-	-	-	-
BH01_4.0-4.45	4.0-4.45	10/11/2018	N	Silty Sand	6.7	5	1.7	1	-	-	-	-	-	-	-	-	-	-
BH01_5.5-5.95	5.0-5.95	10/11/2018	N	Sand	9.2	7.7	1.5	1	-	-	-	-	-	-	-	-	-	-
BH01_7.0-7.45	7.0-7.45	10/11/2018	N	Silty Clay	9	5.1	3.9	2	-	-	-	-	-	-	-	-	-	-
BH01_8.5-8.95	8.5-8.95	10/11/2018	N	Sandy Clay	8.9	4.2	4.7	3	9	7.3	<2	<2	0.4	0.34	0.90	<2	<0.02	<1
BH01_10.0-10.45	10.0-10.45	10/11/2018	N	Clayey Sand	9.2	4.3	4.9	3	9.2	7	<2	<2	0.15	0.16	0.40	<2	<0.02	<1
BH01_11.0-11.45	11.0-11.45	10/11/2018	N	Clayey Sand	8.5	7.1	1.4	1	-	-	-	-	-	-	-	-	-	-
BH01_13.0-13.45	13.0-13.45	10/11/2018	N	Sand	8.3	5.2	3.1	4	-	-	-	-	-	-	-	-	-	-
BH01_14.5-14.95	14.5-14.95	10/11/2018	N	Sand	8.2	5.8	2.4	1	-	-	-	-	-	-	-	-	-	-
BH01_16.0-16.45	16.0-16.45	10/11/2018	N	Sand	6.9	3.1	3.8	2	5.5	4.4	47	40	0.07	0.05	n/a	7	0.06	2.9
BH02_2.0-2.45	2.0-2.45	17/11/2018	N	Silty Sand	7.8	6.1	1.7	1	-	-	-	-	-	-	-	-	-	-
BH02_4.0-4.45	4.0-4.45	17/11/2018	N	Sand	6.8	5.2	1.6	1	5.9	7.2	<2	<2	0.24	<0.005	n/a	<2	<0.02	<1
BH02_5.5-5.95	5.5-5.95	17/11/2018	N	Sand	9.6	7.5	2.1	1	-	-	-	-	-	-	-	-	-	-
BH02_7.0-7.45	7.0-7.45	17/11/2018	N	Sand	8.8	6.2	2.6	4	9.1	7.2	<2	<2	0.06	0.13	0.56	<2	<0.02	<1
BH02_8.5-8.95	8.5-8.95	17/11/2018	N	Sandy Clay	8.6	5.9	2.7	4	-	-	-	-	-	-	-	-	-	-
BH02_10.0-10.45	10.0-10.45	17/11/2018	N	Sandy Clay	9.1	5.1	4	4	-	-	-	-	-	-	-	-	-	-
BH02_11.5-11.95	11.5-11.95	17/11/2018	N	Sandy Clay	9	4.5	4.5	4	9.3	7.4	<2	<2	0.09	0.082	0.31	<2	<0.02	<1
BH02_13.0-13.45	13.0-13.45	17/11/2018	N	Sandy Clay	8.2	7.9	0.3	4	-	-	-	-	-	-	-	-	-	-
BH02_14.5-14.95	14.5-14.95	17/11/2018	N	Sand	8.8	6.7	2.1	1	-	-	-	-	-	-	-	-	-	-
BH02_16.0-16.45	16.0-16.45	17/11/2018	N	Sandy Clay	6.9	6.4	0.5	4	-	-	-	-	-	-	-	-	-	-
BH02_17.5-17.95	17.5-17.95	17/11/2018	N	Clayey Sand	6.2	5.6	0.6	4	-	-	-	-	-	-	-	-	-	-
Guideline Value				**Eurofins LOR**	-	-	-	-	0.1	0.1	2	2	0.02	0.005	0.02	2	0.02	1
ASSMAC (1998) Potential Acid Sulfate Soil Indicator Value					4 - 5.5 ^{1}	< 4^{3}	1 ^{4}	-	-	-				-	-	-	-	-
ASSMAC (1998) Actual Acid Sulfate Soil Indicator Value					≤ 4 ^{2}	-	-	-	-	-				-	-	-	-	-
ASSMAC (1998) Action Criteria - Coarse Soils (1 - 1000 tonnes) 5					-	-	-	-	-	-	18	18	0.03	0.03	-	18	0.03	-
ASSMAC (1998) Action Criteria - Medium Soils (1 - 1000 tonnes) ^{6}					-	-	-	-	-	-	36	36	0.06	0.06	-	36	0.06	-
ASSMAC (1998) Action Criteria - Fine Soils (1 - 1000 tonnes) ^{7}					-	-	-	-	-	-	62	62	0.10	0.10	-	62	0.10	-
ASSMAC (1998) Action Criteria - Coarse Soils (>1000 tonnes) 5					-	-	-	-	-	-	18	18	0.03	0.03	-	18	0.03	-
ASSMAC (1998) Action Criteria - Medium Soils (>1000 tonnes) ^{6}					-	-	-	-	-	-	18	18	0.03	0.03	-	18	0.03	-
ASSMAC (1998) Action Criteria - Fine Soils (>1000 tonnes) ^{7}					-	-	-	-	-	-	18	18	0.03	0.03	-	18	0.03	-

Notes to Table:

1 - pH values >4 and <5.5 are acid and may be the result of some previous or limited oxidation of sulfides, but is not confirmatory of actual acid sulfate soils

2 - pH readings of pH≤4, indicates that actual acid sulfate soils are present with the sulfides having been oxidized in the past, resulting in acid soils (and soil pore water)

3 - The lower the final pH_{FOX} value is, the better the indication of a positive result.
» If the pH_{FOX} < 3 and there was a strong reaction to the peroxide, there is a high level of certainty of a potential acid sulfate soils. The more the pH_{FOX} drops below 3, the more positive the presence of sulfides.
» A pH_{FOX} 3-4 is less positive and laboratory analyses are needed to confirm if sulfides are present.
» For pH_{FOX} 4-5 the test is neither positive nor negative. Sulfides may be present either in small quantities and be poorly reactive under quick test field conditions.
» For pH_{FOX} >5 and little or no drop in pH from the field value, little net acid generating ability is indicated.

4 - If the pH_F value is at least one unit below field pH_{FOX}, it may indicate potential acid sulfate soils. The greater the difference between the two measurements, the more indicative the value is of a potential acid sulfate soils.

5 - coarse soils comprise sands to loamy sands - Approximate clay content (% < 0.002mm) ≤ 5%
6 - Medium soils comprise sandy loams to light clays - Approximate clay content (% < 0.002mm) between 5 and 40%
7 - Fine soils comprise medium to heavy clays and silty clays - Approximate clay content (% < 0.002mm) ≥ 40%
8 - NT - Not Tested

9 - 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Liming Rate: A Safety Factor of 1.5 has been incorporated to account for the mixing process

Acid Trail / Net Acidity - Indicates acidic soils, however may not indicate Acid Sulfate Soils

Contaminant Exceedance Indicators:

Bold	Indicates the laboratory result is within the specified range of the ASSMAC (1998) Actual Acid Sulfate Soil Indicator Values
Italics	Indicates the laboratory result either exceeds or is within the specified range of the ASSMAC (1998) Potential Acid Sulfate Soil Indicator Values
🟩	Indicates exceedance of the ASSMAC (1998) Action Criteria triggering the need to prepare a ASS Management Plan
🟨	Indicates the requirement for localised lime treatment of the material, that is, when the laboratory results for SCr (%w/w) > 0.03 and the SCr (mole H=/t) > 18

Location	Depth (m)	Date Sampled	Filling (F) / Natural (N)	Material Type	pH_F	pH_{FOX}	pH_F - pH_{FOX}	Reaction Rate	pH kcl	Peroxide pH	TPA	TSA	Peroxide Oxidisable Sulfur	Chromium Reducible Sulfur	Acid Neutralising Capacity	Acid Trail	Net Acidity	Liming rate
					pH units	pH units	pH units		pH units	pH Units	mol H+/t	mol H+/t	%S	%S	%S	TAA Mole H+/t	%S	kg $CaCO_3$/t
BH03_1.0-1.1	1.0-1.1	17/11/2018	F	Sand	6.4	5	1.4	1	-	-	-	-	-	-	-	-	-	-
BH03_2.5-2.95	2.5-2.95	17/11/2018	N	Sand	6.8	5	1.8	2	-	-	-	-	-	-	-	-	-	-
BH03_4.0-4.45	4.0-4.45	17/11/2018	N	Sand	9.3	7.4	1.9	1	-	-	-	-	-	-	-	-	-	-
BH03_5.5-5.95	5.5-5.95	17/11/2018	N	Sand	9.4	7.5	1.9	1	-	-	-	-	-	-	-	-	-	-
BH03_7.0-7.45	7.0-7.45	17/11/2018	N	Sand	9	7	2	2	-	-	-	-	-	-	-	-	-	-
BH03_8.5-8.95	8.5-8.95	17/11/2018	N	Sandy Clay	9.1	6.2	2.9	4	9.3	7.5	<2	<2	0.35	0.29	1.00	<2	<0.02	<1
BH03_10.0-10.45	10.0-10.45	17/11/2018	N	Sandy Clay	8.9	2.3	6.6	4	8.2	2.6	210	210	0.48	0.35	0.24	<2	0.19	8.8
BH03_11.5-11.95	11.5-11.95	17/11/2018	N	Sand	8.1	4.4	3.7	2	-	-	-	-	-	-	-	-	-	-
BH03_13.0-13.45	13.0-13.45	17/11/2018	N	Sand	8.3	6.1	2.2	2	-	-	-	-	-	-	-	-	-	-
BH04_0.5-0.95	0.5-0.95	10/11/2018	F	Sand	6.2	3.9	2.3	1	6.7	4.9	<2	<2	<0.02	<0.005	0.09	<2	<0.02	<1
BH04_2.0-2.45	2.0-2.45	10/11/2018	N	Silty Sand	4.9	3.3	1.6	1	5.7	4.4	<2	<2	<0.02	<0.005	n/a	3	<0.02	<1
BH04_3.0-3.45	3.0-3.45	10/11/2018	N	Silty Sand	5.5	3.4	2.1	1	-	-	-	-	-	-	-	-	-	-
BH05_1.5-1.95	1.5-1.95	10/11/2018	N	Silty Sand	5.6	3.5	2.1	1	5.7	4.9	<2	<2	<0.02	<0.005	n/a	3	<0.02	<1
BH05_4.5-4.95	4.5-4.95	11/11/2018	N	Sand	6.5	5	1.5	1	-	-	-	-	-	-	-	-	-	-
Guideline Value				**Eurofins LOR**	-	-	-	-	0.1	0.1	2	2	0.02	0.005	0.02	2	0.02	1
ASSMAC (1998) Potential Acid Sulfate Soil Indicator Value					4 - 5.5 [1]	< 4[3]	1 [4]	-	-	-				-	-	-	-	-
ASSMAC (1998) Actual Acid Sulfate Soil Indicator Value					≤ 4 [2]	-	-	-	-	-				-	-	-	-	-
ASSMAC (1998) Action Criteria - Coarse Soils (1 - 1000 tonnes) 5					-	-	-	-	-	-	18	18	0.03	0.03	-	18	0.03	-
ASSMAC (1998) Action Criteria - Medium Soils (1 - 1000 tonnes) [6]					-	-	-	-	-	-	36	36	0.06	0.06	-	36	0.06	-
ASSMAC (1998) Action Criteria - Fine Soils (1 - 1000 tonnes) [7]					-	-	-	-	-	-	62	62	0.10	0.10	-	62	0.10	-
ASSMAC (1998) Action Criteria - Coarse Soils (>1000 tonnes) 5					-	-	-	-	-	-	18	18	0.03	0.03	-	18	0.03	-
ASSMAC (1998) Action Criteria - Medium Soils (>1000 tonnes) [6]					-	-	-	-	-	-	18	18	0.03	0.03	-	18	0.03	-
ASSMAC (1998) Action Criteria - Fine Soils (>1000 tonnes) [7]					-	-	-	-	-	-	18	18	0.03	0.03	-	18	0.03	-

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		BTEX							TPH					MAH									
		Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Total BTEX	Xylene Total	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	Total MAH	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.1	0.1	0.1	0.2	0.1	0.2	0.3	10	20	50	50	50	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NSW 2014 General Solid Waste CT1 (No Leaching)		10	288	600				1,000	650				10,000									60	
NSW 2014 Restricted Solid Waste CT2 (No Leaching)		40	1,152	2,400				4,000	2,600				40,000									240	
NSW 2014 General Solid Waste SCC1 (with leached)		18	518	1,080				1,800	6500				10,000									108	
Field ID	**Date**																						
ASB2	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02_0.5	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
BH2_1.0	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
BH03_0.5	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
BH4_0.4	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	**370**	**1,600**	**1,970**	-	-	-	-	-	-	-	-	-	-
BH05_0.2-0.5	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP01_0.2	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	**62**	**62**	-	-	-	-	-	-	-	-	-	-
TP01_0.9	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP02_0.1	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	**63**	**110**	**173**	-	-	-	-	-	-	-	-	-	-
TP02_0.4	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP03_0.2	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP03_1.2	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP03_ASB1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04_0.1	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP04_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.1	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP05_0.9	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP06_0.1	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	**100**	**480**	**580**	-	-	-	-	-	-	-	-	-	-
TP06_0.3	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP07_0.1	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP07_0.4	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP07_0.6	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP08_0.4	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP09_0.3	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP10_0.1	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	**91**	**91**	-	-	-	-	-	-	-	-	-	-
TP11_0.2	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP11_1.2	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	**72**	**92**	**164**	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP12_0.2	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP13_0.1	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	**70**	**290**	**360**	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP13_0.4	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.7	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP15_0.1	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP15_0.6	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP16_0.1	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP16_0.8	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP17_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17_0.5	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP18_0.1	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP18_0.4	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
TP19_0.1	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP19_0.3	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
TP20_0.1	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
QA100	**10/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-
QA200	**10/11/2018**	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<10	<50	<100	<100	<50	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QA300	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	-	<0.3	<20	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
QA400	**17/11/2018**	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<10	<50	<100	<100	<50	-	-	-	-	-	-	-	-	-	-

Statistics

Number of Results	**43**	**43**	**43**	**43**	**43**	**2**	**43**	**41**	**41**	**41**	**41**	**41**	**14**	**15**	**15**	**15**	**1**	**1**	**1**	**1**	**15**	**1**
Minimum Concentration	**<0.1**	**<0.1**	**<0.1**	**<0.2**	**<0.1**	**<0.2**	**<0.3**	**<10**	**<20**	**<50**	**<50**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
Maximum Concentration	**83**	**82**	**82**	**83**	**84**	**<0.2**	**84**	**<20**	**<50**	**370**	**1,600**	**1,970**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
Average Concentration *	**2**	**2**	**2**	**2**	**2**	**0.1**	**2.1**	**9.8**	**11**	**40**	**88**	**104**	**0.25**	**0.25**	**0.25**	**0.25**					**0.25**	
Standard Deviation *	**13**	**12**	**12**	**13**	**13**	**0**	**13**	**1.1**	**3.3**	**55**	**256**	**316**	**0**	**0**	**0**	**0**					**0**	

* A Non Detect Multiplier of 0.5 has been applied.

Cardno

Soil Analytical Summary - Waste Classification
Kyeemagh Infants School
Project: 80818157

DWP Australia
Kyeemagh NSW

		PAH																				Asbestos		
		BaP TEQ (zero)	Benzo(a)pyrene TEQ (half LOR)_	Benzo(a)pyrene TEQ (upper bound) *	Benzo(b+j)fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Sum of total)	Phenanthrene	Pyrene	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil	Asbestos Reported Result
		mg/kg	mg/kg	MG/KG	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%w/w	%w/w	Comment
EQL		0.5	0.5		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5			
NSW 2014 General Solid Waste CT1 (No Leaching)										0.8									200					
NSW 2014 Restricted Solid Waste CT2 (No Leaching)										3.2									800					
NSW 2014 General Solid Waste SCC1 (with leached)										10														
Field ID	Date																							
ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y
BH02_0.5	17/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
BH2_1.0	17/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
BH03_0.5	17/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
BH4_0.4	10/11/2018	1.0	1.3	1.7	0.6	<0.5	<0.5	<0.5	<0.5	0.9	<0.5	0.8	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	3.4	<0.5	0.5	-	-	-
BH05_0.2-0.5	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP01_0.2	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP01_0.9	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP02_0.1	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP02_0.4	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP03_0.2	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP03_1.2	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP03_ASB1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y
TP04_0.1	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP04_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1908	<0.001	Y
TP05_0.1	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP05_0.9	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP06_0.1	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP06_0.3	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP07_0.1	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP07_0.4	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP07_0.6	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP08_0.4	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP09_0.3	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP10_0.1	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP11_0.2	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP11_1.2	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP12_0.2	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP13_0.1	17/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP13_0.4	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	N
TP14_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	N
TP14_0.7	17/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP15_0.1	17/11/2018	0.9	1.2	1.5	<0.5	<0.5	<0.5	<0.5	1.1	0.7	<0.5	0.7	1.0	<0.5	1.3	<0.5	<0.5	<0.5	6.9	0.8	1.3	-	-	-
TP15_0.6	17/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP16_0.1	17/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP16_0.8	17/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP17_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	N
TP17_0.5	17/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP18_0.1	17/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP18_0.4	17/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
TP19_0.1	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP19_0.3	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
TP20_0.1	17/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.001	<0.001	N
QA100	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
QA200	10/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
QA300	17/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
QA400	17/11/2018	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-

Statistics

Number of Results	41	41	39	41	41	41	41	41	41	41	41	41	41	41	41	41	83	41	41	41	25	25	25
Minimum Concentration	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	0	0	1
Maximum Concentration	1	1.3	1.7	0.6	<0.5	<0.5	<0.5	1.1	0.9	<0.5	0.8	1	<0.5	1.3	<0.5	<0.5	<1	6.9	0.8	1.3	0.1908	0	1
Average Concentration *	0.28	0.63	1.2	0.26	0.25	0.25	0.25	0.27	0.28	0.25	0.27	0.27	0.25	0.28	0.25	0.25	0.26	0.49	0.26	0.28	0.0076	0	1
Standard Deviation *	0.15	0.14	0.092	0.055	0	0	0	0.13	0.12	0	0.11	0.12	0	0.17	0	0	0.032	1.1	0.086	0.17	0.038	0	0

* A Non Detect Multiplier of 0.5 has been applied.

Soil Analytical Summary - Waste Classification
Kyeemagh Infants School
Project: 80818157

DWP Australia
Kyeemagh NSW

		Metals									VOCs			SVOCs												
		Arsenic	Cadmium	Chromium (III+VI)	Copper	Iron	Lead	Mercury	Nickel	Zinc	cis-1,4-Dichloro-2-butene	Pentachloroethane	trans-1,4-Dichloro-2-butene	EPN	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		2	0.4	2	5	20	5	0.1	2	5	0.5	0.5	0.5	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NSW 2014 General Solid Waste CT1 (No Leaching)		100	20	100			100	4	40						200	600	26	24		14				10		
NSW 2014 Restricted Solid Waste CT2 (No Leaching)		400	80	400			400	16	160						800	2,400	104	96		56				40		
NSW 2014 General Solid Waste SCC1 (with leached)		500	100	1,900			1,500	50	1,050						360	1,080	46.8	43.2		0.7				0.5		
Field ID	**Date**																									
ASB2	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02_0.5	**17/11/2018**	<2	<0.4	<5	<5	-	**9.8**	<0.1	<5	**17**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2_1.0	**17/11/2018**	<2	<0.4	<5	**5.6**	-	**12**	<0.1	<5	**24**	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
BH03_0.5	**17/11/2018**	<2	<0.4	<5	<5	-	**7.0**	<0.1	<5	**6.8**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4_0.4	**10/11/2018**	<2	<0.4	<5	**11**	-	**13**	<0.1	**13**	**25**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05_0.2-0.5	**10/11/2018**	<2	<0.4	<5	<5	-	<5	<0.1	<5	<5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP01_0.2	**10/11/2018**	<2	<0.4	**8.8**	**27**	-	**19**	<0.1	**15**	**44**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01_0.9	**10/11/2018**	<2	<0.4	<5	<5	-	**18**	<0.1	<5	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP02_0.1	**10/11/2018**	<2	<0.4	**18**	**9.4**	-	**35**	**0.7**	**15**	**72**	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
TP02_0.4	**10/11/2018**	<2	<0.4	**10**	**6.8**	-	**8.1**	<0.1	**9.6**	**27**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03_0.2	**10/11/2018**	<2	<0.4	<5	**6.6**	-	**19**	<0.1	<5	**35**	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
TP03_1.2	**10/11/2018**	<2	<0.4	<5	<5	-	**6.2**	<0.1	<5	**11**	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP03_ASB1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04_0.1	**10/11/2018**	<2	<0.4	<5	**8.7**	-	**38**	<0.1	<5	**36**	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
TP04_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.1	**10/11/2018**	<2	<0.4	<5	**5.2**	-	**23**	<0.1	<5	**23**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.9	**10/11/2018**	<2	<0.4	<5	<5	**360**	<5	<0.1	<5	<5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP06_0.1	**10/11/2018**	**2.8**	<0.4	**130**	**37**	-	**8.1**	<0.1	**130**	**86**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06_0.3	**10/11/2018**	<2	<0.4	**13**	**16**	-	**11**	<0.1	**17**	**26**	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP07_0.1	**10/11/2018**	**2.5**	<0.4	**6.4**	**8.4**	-	**17**	**1.5**	<5	**46**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.4	**10/11/2018**	<2	<0.4	<5	<5	**1,500**	**11**	**0.2**	<5	**15**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.6	**10/11/2018**	<2	<0.4	<5	**13**	-	**9.0**	**0.7**	<5	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP08_0.4	**10/11/2018**	<2	<0.4	<5	<5	-	**7.3**	<0.1	<5	**10**	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP09_0.3	**10/11/2018**	<2	<0.4	<5	<5	-	**10**	<0.1	<5	**14**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP10_0.1	**10/11/2018**	<2	<0.4	<5	<5	-	**10**	<0.1	<5	**21**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11_0.2	**10/11/2018**	<2	<0.4	<5	<5	-	<5	<0.1	<5	<5	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
TP11_1.2	**10/11/2018**	<2	<0.4	<5	<5	-	**19**	<0.1	<5	**12**	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP12_0.2	**10/11/2018**	<2	<0.4	<5	<5	**630**	**13**	<0.1	<5	**17**	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
TP13_0.1	**17/11/2018**	<2	<0.4	**32**	**12**	-	**11**	<0.1	**30**	**40**	-	-	-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP13_0.4	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.7	**17/11/2018**	<2	<0.4	<5	<5	-	<5	<0.1	<5	<5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP15_0.1	**17/11/2018**	<2	<0.4	<5	**16**	-	**65**	**0.1**	<5	**43**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15_0.6	**17/11/2018**	<2	<0.4	<5	<5	-	<5	<0.1	<5	**120**	-	-	-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP16_0.1	**17/11/2018**	<2	<0.4	<5	<5	-	**17**	<0.1	<5	**18**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP16_0.8	**17/11/2018**	<2	<0.4	<5	<5	-	**5.1**	<0.1	<5	**8.3**	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP17_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17_0.5	**17/11/2018**	<2	<0.4	<5	<5	-	<5	<0.1	<5	<5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP18_0.1	**17/11/2018**	<2	<0.4	<5	**11**	-	**56**	<0.1	<5	**130**	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
TP18_0.4	**17/11/2018**	<2	<0.4	<5	<5	-	<5	<0.1	<5	<5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
TP19_0.1	**10/11/2018**	<2	<0.4	<5	**7.3**	-	**32**	<0.1	<5	**29**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19_0.3	**10/11/2018**	<2	<0.4	<5	**10**	-	**10**	<0.1	<5	**25**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP20_0.1	**17/11/2018**	<2	<0.4	**5.3**	**12**	-	**42**	<0.1	<5	**66**	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
QA100	**10/11/2018**	<2	<0.4	<5	**11**	-	**14**	<0.1	<5	**15**	-	-	-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5
QA200	**10/11/2018**	<5	<1	<2	<5	-	**8**	<0.1	<2	**10**	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QA300	**17/11/2018**	<2	<0.4	<5	**5.2**	-	**19**	<0.1	<5	**20**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA400	**17/11/2018**	<5	<1	<2	**5**	-	**21**	<0.1	<2	**22**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistics

Number of Results	**41**	**41**	**41**	**41**	**3**	**41**	**41**	**41**	**41**	**1**	**1**	**1**	**10**	**15**	**15**	**15**	**15**	**15**	**15**	**1**	**15**	**1**	**15**	**15**	**15**
Minimum Concentration	**<2**	**<0.4**	**<2**	**5**	**360**	**<5**	**0.1**	**<2**	**<5**	**<0.5**	**<0.5**	**<0.5**	**<0.2**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
Maximum Concentration	**<5**	**<1**	**130**	**37**	**1,500**	**65**	**1.5**	**130**	**130**	**<0.5**	**<0.5**	**<0.5**	**<0.2**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
Average Concentration *	**1.2**	**0.21**	**7.4**	**7.2**	**830**	**16**	**0.12**	**7.6**	**29**				**0.1**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**		**0.25**		**0.25**	**0.25**	**0.25**
Standard Deviation *	**0.47**	**0.065**	**20**	**7.1**	**596**	**14**	**0.26**	**20**	**29**				**0**	**0**	**0**	**0**	**0**	**0**	**0**		**0**		**0**	**0**	**0**

* A Non Detect Multiplier of 0.5 has been applied.

		Chlorinated Hydrocarbons																		
		2,2-dichloropropane	Bromochloromethane	Bromodichloromethane	Bromoform	Carbon tetrachloride	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Dibromomethane	Dichloromethane	Hexachlorobutadiene	Trichloroethene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NSW 2014 General Solid Waste CT1 (No Leaching)						10			120					172		10	14			4
NSW 2014 Restricted Solid Waste CT2 (No Leaching)						40			480					688		40	56			16
NSW 2014 General Solid Waste SCC1 (with leached)						18			126					8.6		18	25.2			7.2
Field ID	**Date**																			
ASB2	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02_0.5	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2_1.0	17/11/2018	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
BH03_0.5	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05_0.2-0.5	10/11/2018	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP01_0.2	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01_0.9	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP02_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP02_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03_0.2	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03_1.2	10/11/2018	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP03_ASB1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.9	10/11/2018	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP06_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06_0.3	10/11/2018	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP07_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.4	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.6	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP08_0.4	10/11/2018	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP09_0.3	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP10_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11_0.2	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11_1.2	10/11/2018	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP12_0.2	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP13_0.1	17/11/2018	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP13_0.4	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.7	17/11/2018	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP15_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15_0.6	17/11/2018	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP16_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP16_0.8	17/11/2018	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP17_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17_0.5	17/11/2018	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP18_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP18_0.4	17/11/2018	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP19_0.1	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19_0.3	10/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP20_0.1	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA100	10/11/2018	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
QA200	10/11/2018	<0.5	-	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<5
QA300	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA400	17/11/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistics

Number of Results	**1**	**14**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**14**	**1**	**15**	**15**	**15**	**15**	**15**
Minimum Concentration	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
Maximum Concentration	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<5**	**<0.5**	**<5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<5**
Average Concentration *		**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.4**	**0.25**	**0.4**	**0.25**	**0.25**	**0.25**	**0.25**		**0.25**	**0.25**	**0.25**	**0.25**	**0.4**
Standard Deviation *		**0**	**0**	**0**	**0**	**0**	**0.58**	**0**	**0.58**	**0**	**0**	**0**	**0**		**0**	**0**	**0**	**0**	**0.58**

* A Non Detect Multiplier of 0.5 has been applied.

		Halogenated Hydrocarbons																						
		1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-dibromoethane	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	2-chlorotoluene	4-chlorotoluene	Bromobenzene	Bromomethane	Chlorobenzene	Dichlorodifluoromethane	Iodomethane	Trichlorofluoromethane	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
NSW 2014 General Solid Waste CT1 (No Leaching)					86		150					2,000												
NSW 2014 Restricted Solid Waste CT2 (No Leaching)					344		600					8,000												
NSW 2014 General Solid Waste SCC1 (with leached)					4.3		7.5					3,600												
Field ID	**Date**																							
ASB2	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02_0.5	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2_1.0	**17/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
BH03_0.5	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05_0.2-0.5	**10/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
TP01_0.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01_0.9	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP02_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.06**	<0.05	<0.05	**0.64**	<0.05	**0.7**	-	-	<0.05
TP02_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03_0.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05
TP03_1.2	**10/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
TP03_ASB1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05
TP04_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.9	**10/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
TP06_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06_0.3	**10/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
TP07_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.6	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP08_0.4	**10/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
TP09_0.3	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP10_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11_0.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05
TP11_1.2	**10/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
TP12_0.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05
TP13_0.1	**17/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05
TP13_0.4	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.7	**17/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
TP15_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15_0.6	**17/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05
TP16_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP16_0.8	**17/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
TP17_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17_0.5	**17/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
TP18_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	**0.05**	<0.05	<0.1	-	-	<0.05
TP18_0.4	**17/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-
TP19_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19_0.3	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP20_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05
QA100	**10/11/2018**	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	-	-	<0.05
QA200	**10/11/2018**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<5	<0.5	<5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
QA300	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA400	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistics

Number of Results	**1**	**1**	**15**	**15**	**15**	**15**	**1**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**11**	**11**	**11**	**11**	**11**	**11**	**1**	**1**	**11**
Minimum Concentration	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.05**	**<0.05**	**<0.05**	**0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**
Maximum Concentration	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<5**	**<0.5**	**<5**	**<0.5**	**<5**	**0.06**	**<0.05**	**<0.05**	**0.64**	**<0.05**	**0.7**	**<0.05**	**<0.05**	**<0.05**
Average Concentration *			**0.25**	**0.25**	**0.25**	**0.25**		**0.25**	**0.25**	**0.4**	**0.25**	**0.4**	**0.25**	**0.4**	**0.028**	**0.025**	**0.025**	**0.083**	**0.025**	**0.11**			**0.025**
Standard Deviation *			**0**	**0**	**0**	**0**		**0**	**0**	**0.58**	**0**	**0.58**	**0**	**0.58**	**0.011**	**0**	**0**	**0.18**	**0**	**0.2**			**0**

* A Non Detect Multiplier of 0.5 has been applied.

Soil Analytical Summary - Waste Classification
Kyeemagh Infants School
Project: 80818157

DWP Australia
Kyeemagh NSW

		Organochlorine Pesticides																							
		DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene	Azinophos methyl	Bolstar (Sulprofos)	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	1	0.05	0.2	0.05	0.05	0.05	0.05	0.05
NSW 2014 General Solid Waste CT1 (No Leaching)						60	60	60	60															4	
NSW 2014 Restricted Solid Waste CT2 (No Leaching)						240	240	240	240															16	
NSW 2014 General Solid Waste SCC1 (with leached)						3|108	108	108	108															7.5	
Field ID	**Date**																								
ASB2	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02_0.5	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2_1.0	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03_0.5	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05_0.2-0.5	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01_0.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01_0.9	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP02_0.1	**10/11/2018**	<0.05	**0.06**	**0.12**	**0.64**	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	-	-	<0.2	<0.2	<0.2
TP02_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03_0.2	**10/11/2018**	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	-	-	<0.2	<0.2	<0.2
TP03_1.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03_ASB1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04_0.1	**10/11/2018**	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	-	-	<0.2	<0.2	<0.2
TP04_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.9	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06_0.3	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.6	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP08_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP09_0.3	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP10_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11_0.2	**10/11/2018**	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	-	-	<0.2	<0.2	<0.2
TP11_1.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP12_0.2	**10/11/2018**	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	-	-	<0.2	<0.2	<0.2
TP13_0.1	**17/11/2018**	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	-	-	<0.2	<0.2	<0.2
TP13_0.4	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.7	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15_0.6	**17/11/2018**	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	-	-	<0.2	<0.2	<0.2
TP16_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP16_0.8	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17_0.5	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP18_0.1	**17/11/2018**	<0.05	<0.05	<0.05	**0.05**	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	-	-	<0.2	<0.2	<0.2
TP18_0.4	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19_0.3	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP20_0.1	**17/11/2018**	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	-	-	<0.2	<0.2	<0.2
QA100	**10/11/2018**	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	-	-	<0.2	<0.2	<0.2
QA200	**10/11/2018**	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05
QA300	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA400	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistics

Number of Results	**11**	**11**	**11**	**11**	**1**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**10**	**11**	**10**	**1**	**1**	**11**	**11**	**11**
Minimum Concentration	**<0.05**	**<0.05**	**<0.05**	**0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<1**	**<0.05**	**<0.2**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**
Maximum Concentration	**<0.05**	**<0.2**	**0.12**	**0.64**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.2**	**<1**	**<0.2**	**<0.2**	**<0.05**	**<0.05**	**<0.2**	**<0.2**	**<0.2**
Average Concentration *	**0.025**	**0.035**	**0.034**	**0.083**		**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.032**	**0.5**	**0.093**	**0.1**			**0.093**	**0.093**	**0.093**
Standard Deviation *	**0**	**0.024**	**0.029**	**0.18**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.023**	**0**	**0.023**	**0**			**0.023**	**0.023**	**0.023**

* A Non Detect Multiplier of 0.5 has been applied.

		Organophosphorous Pesticides																								
		Coumaphos	Demeton-O	Demeton-S	Diazinon	Dichlorvos	Dimethoate	Disulfoton	Ethion	Ethoprop	Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Phorate	Prothiofos	Pyrazophos	Ronnel	Terbufos	Trichloronate
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		2	0.2	0.2	0.05	0.05	0.05	0.2	0.05	0.2	0.2	0.2	0.05	0.05	0.2	0.2	0.2	0.2	0.2	2	0.2	0.05	0.2	0.2	0.2	0.2
NSW 2014 General Solid Waste CT1 (No Leaching)																										
NSW 2014 Restricted Solid Waste CT2 (No Leaching)																										
NSW 2014 General Solid Waste SCC1 (with leached)																										
Field ID	**Date**																									
ASB2	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02_0.5	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2_1.0	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03_0.5	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05_0.2-0.5	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01_0.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01_0.9	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP02_0.1	**10/11/2018**	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2
TP02_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03_0.2	**10/11/2018**	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2
TP03_1.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03_ASB1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04_0.1	**10/11/2018**	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2
TP04_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.9	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06_0.3	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.6	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP08_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP09_0.3	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP10_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11_0.2	**10/11/2018**	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2
TP11_1.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP12_0.2	**10/11/2018**	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2
TP13_0.1	**17/11/2018**	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2
TP13_0.4	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.7	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15_0.6	**17/11/2018**	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2
TP16_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP16_0.8	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17_0.5	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP18_0.1	**17/11/2018**	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2
TP18_0.4	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19_0.3	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP20_0.1	**17/11/2018**	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2
QA100	**10/11/2018**	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	-	<0.2	<0.2	<0.2	<0.2
QA200	**10/11/2018**	-	-	-	<0.05	<0.05	<0.05	-	<0.05	-	-	-	<0.05	<0.05	-	<0.2	-	<0.2	-	-	-	<0.05	-	-	-	-
QA300	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA400	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistics

	Coumaphos	Demeton-O	Demeton-S	Diazinon	Dichlorvos	Dimethoate	Disulfoton	Ethion	Ethoprop	Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Phorate	Prothiofos	Pyrazophos	Ronnel	Terbufos	Trichloronate
Number of Results	**10**	**10**	**10**	**11**	**11**	**11**	**10**	**11**	**10**	**10**	**10**	**11**	**11**	**10**	**11**	**10**	**11**	**10**	**10**	**10**	**1**	**10**	**10**	**10**	**10**
Minimum Concentration	**<2**	**<0.2**	**<0.2**	**<0.05**	**<0.05**	**<0.05**	**<0.2**	**<0.05**	**<0.2**	**<0.2**	**<0.2**	**<0.05**	**<0.05**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<2**	**<0.2**	**<0.05**	**<0.2**	**<0.2**	**<0.2**	**<0.2**
Maximum Concentration	**<2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<0.2**	**<2**	**<0.2**	**<2**	**<0.2**	**<0.05**	**<0.2**	**<0.2**	**<0.2**	**<0.2**
Average Concentration *	**1**	**0.1**	**0.1**	**0.093**	**0.093**	**0.093**	**0.1**	**0.093**	**0.1**	**0.1**	**0.1**	**0.093**	**0.093**	**0.1**	**0.1**	**0.1**	**0.92**	**0.1**	**1**	**0.1**		**0.1**	**0.1**	**0.1**	**0.1**
Standard Deviation *	**0**	**0**	**0**	**0.023**	**0.023**	**0.023**	**0**	**0.023**	**0**	**0**	**0**	**0.023**	**0.023**	**0**	**0**	**0**	**0.27**	**0**	**0**	**0**		**0**	**0**	**0**	**0**

* A Non Detect Multiplier of 0.5 has been applied.

Soil Analytical Summary - Waste Classification
Kyeemagh Infants School
Project: 80818157

DWP Australia
Kyeemagh NSW

			Solvents							Insecticides	Pesticides					Polychlorinated Biphenyls							
		Tetrachlorvinphos	Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Acetone	Allyl chloride	Carbon disulfide	Vinyl acetate	Tokuthion	Demeton-S-methyl	Fenamiphos	Parathion	Pirimiphos-methyl	Pirimphos-ethyl	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Sum of total)
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.2	0.5	5	0.5	0.5	0.5	0.5	5	0.2	0.05	0.05	0.2	0.2	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NSW 2014 General Solid Waste CT1 (No Leaching)			4,000																				50
NSW 2014 Restricted Solid Waste CT2 (No Leaching)			16,000																				50
NSW 2014 General Solid Waste SCC1 (with leached)			7,200																				50
Field ID	**Date**																						
ASB2	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02_0.5	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2_1.0	**17/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03_0.5	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05_0.2-0.5	**10/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01_0.2	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01_0.9	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP02_0.1	**10/11/2018**	<0.2	-	-	-	-	-	-	-	<0.2	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP02_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03_0.2	**10/11/2018**	<0.2	-	-	-	-	-	-	-	<0.2	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP03_1.2	**10/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03_ASB1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04_0.1	**10/11/2018**	<0.2	-	-	-	-	-	-	-	<0.2	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP04_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05_0.9	**10/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP06_0.3	**10/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.4	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07_0.6	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP08_0.4	**10/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP09_0.3	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP10_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11_0.2	**10/11/2018**	<0.2	-	-	-	-	-	-	-	<0.2	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP11_1.2	**10/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP12_0.2	**10/11/2018**	<0.2	-	-	-	-	-	-	-	<0.2	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP13_0.1	**17/11/2018**	<0.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.2	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP13_0.4	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14_0.7	**17/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15_0.6	**17/11/2018**	<0.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.2	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP16_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP16_0.8	**17/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17_0.1	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP17_0.5	**17/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP18_0.1	**17/11/2018**	<0.2	-	-	-	-	-	-	-	<0.2	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP18_0.4	**17/11/2018**	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19_0.1	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19_0.3	**10/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP20_0.1	**17/11/2018**	<0.2	-	-	-	-	-	-	-	<0.2	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
QA100	**10/11/2018**	<0.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.2	-	-	<0.2	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
QA200	**10/11/2018**	-	<5	<5	<5	-	-	<0.5	<5	-	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1
QA300	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA400	**17/11/2018**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Statistics																							
Number of Results		**10**	**15**	**1**	**15**	**14**	**14**	**15**	**1**	**10**	**1**	**1**	**11**	**10**	**1**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**11**
Minimum Concentration		**<0.2**	**<0.5**	**<5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<5**	**<0.2**	**<0.05**	**<0.05**	**<0.2**	**<0.2**	**<0.05**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**
Maximum Concentration		**<0.2**	**<5**	**<5**	**<5**	**<0.5**	**<0.5**	**<0.5**	**<5**	**<0.2**	**<0.05**	**<0.05**	**<0.2**	**<0.2**	**<0.05**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**
Average Concentration *		**0.1**	**0.4**		**0.4**	**0.25**	**0.25**	**0.25**		**0.1**			**0.1**	**0.1**		**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**
Standard Deviation *		**0**	**0.58**		**0.58**	**0**	**0**	**0**		**0**			**0**	**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

* A Non Detect Multiplier of 0.5 has been applied.

Cardno

Groundwater Analytical Summary
Kyeemagh Infant School
Project: 80818157

DWP Architects
Pyrmont NSW

	BTEX						TRH				
	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR	1	1	1	2	1	2	20	50	100	50	50
ANZECC 2000 Marine Water (90%)	900										
NEPM 2013 Table 1C GILs, Marine Waters	500										
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand											
2-4m	800										
4-8m	800										
>8m	900										
ANZECC 2000 Irrigation - Long-term trigger value											
PFAS NEMP 2018 Table 5 Interim marine 90%											

Field ID	Location	Sample Date											
MW01		**23/11/2018**	<1	<1	<1	<2	<1	<3	<20	<50	<100	<100	<100
MW02			<1	<1	<1	<2	<1	<3	<20	<50	<100	<100	<100
MW03			<1	<1	<1	<2	<1	<3	<20	<50	<100	<100	<100
QA100	**MW02**		<1	<1	<1	<2	<1	<3	<20	<50	<100	<100	<100
QA200	**MW02**		<1	<2	<2	<2	<2	<2	<20	<50	<100	<50	<50

Statistical Summary

Maximum Concentration	**<1**	**<2**	**<2**	**<2**	**<2**	**<3**	**<20**	**<50**	**<100**	**<100**	**<100**
Average Concentration *	**<1**	**<2**	**<2**	**<2**	**<2**	**<3**	**<20**	**<50**	**<100**	**<100**	**<100**
Standard Deviation *	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**11**

* A Non Detect Multiplier of 0.5 has been applied.

Groundwater Analytical Summary
Kyeemagh Infant School
Project: 80818157

DWP Architects
Pyrmont NSW

			CRC Care TRH Fractions							PAH				
			C6-C10	C10-C16	C16-C34	C34-C40	C10 - C40 (Sum of total)	F1: C6-C10 less BTEX	F2: >C10-C16 less Naphthalene	Benzo(b+j)fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR			20	50	100	100	100	20	50	1	1	1	1	1
ANZECC 2000 Marine Water (90%)														
NEPM 2013 Table 1C GILs, Marine Waters														
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand														
2-4m								1,000	1,000					
4-8m								1,000	1,000					
>8m								1,000	1,000					
ANZECC 2000 Irrigation - Long-term trigger value														
PFAS NEMP 2018 Table 5 Interim marine 90%														
Field ID	**Location**	**Sample Date**												
MW01		**23/11/2018**	<20	<50	<100	<100	<100	<20	<50	<1	<1	<1	<1	<1
MW02			<20	<50	<100	<100	<100	<20	<50	<1	<1	<1	<1	<1
MW03			<20	<50	<100	<100	<100	<20	<50	<1	<1	<1	<1	<1
QA100	**MW02**		<20	<50	<100	<100	<100	<20	<50	<1	<1	<1	<1	<1
QA200	**MW02**		<20	<100	<100	<100	<100	<20	<100	<1.0	<1.0	<1.0	<1.0	<1.0
Statistical Summary														
Maximum Concentration			**<20**	**<100**	**<100**	**<100**	**<100**	**<20**	**<100**	**<1**	**<1**	**<1**	**<1**	**<1**
Average Concentration *			**<20**	**<100**	**<100**	**<100**	**<100**	**<20**	**<100**	**<1**	**<1**	**<1**	**<1**	**<1**
Standard Deviation *			**0**	**11**	**0**	**0**	**0**	**0**	**11**	**0**	**0**	**0**	**0**	**0**

* A Non Detect Multiplier of 0.5 has been applied.

	PAH												
	BaP TEQ (zero)	**Benzo(a)pyrene**	**Benzo(g,h,i)perylene**	**Benzo(k)fluoranthene**	**Chrysene**	**Dibenz(a,h)anthracene**	**Fluoranthene**	**Fluorene**	**Indeno(1,2,3-c,d)pyrene**	**Naphthalene**	**PAHs (Sum of total)**	**Phenanthrene**	**Pyrene**
	µg/L	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
LOR	0.5	0.5	1	1	1	1	1	1	1	1	0.5	1	1
ANZECC 2000 Marine Water (90%)										90			
NEPM 2013 Table 1C GILs, Marine Waters										50			
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand													
2-4m													
4-8m													
>8m													
ANZECC 2000 Irrigation - Long-term trigger value													
PFAS NEMP 2018 Table 5 Interim marine 90%													

Field ID	**Location**	**Sample Date**													
MW01		**23/11/2018**		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW02				<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW03				<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
QA100	**MW02**			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
QA200	**MW02**		<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0

Statistical Summary

Maximum Concentration	**<0.5**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<10**	**<1**	**<1**	**<1**
Average Concentration *	**<0.6**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<10**	**<1**	**<1**	**<1**
Standard Deviation *		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

* A Non Detect Multiplier of 0.5 has been applied.

	Metals							
	Arsenic (filtered)	Cadmium (filtered)	Chromium (III+VI) (filtered)	Copper (filtered)	Lead (filtered)	Mercury (filtered)	Nickel (filtered)	Zinc (filtered)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR	0.001	0.0001	0.001	0.001	0.001	0.0001	0.001	0.005
ANZECC 2000 Marine Water (90%)		0.014		0.003	0.0066	0.0007	0.2	0.023
NEPM 2013 Table 1C GILs, Marine Waters		0.0007		0.0013	0.0044	0.0001	0.007	0.015
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand								
2-4m								
4-8m								
>8m								
ANZECC 2000 Irrigation - Long-term trigger value	0.1	0.01	0.1	0.2	2	0.002	0.2	2
PFAS NEMP 2018 Table 5 Interim marine 90%								

Field ID	Location	Sample Date	Arsenic (filtered)	Cadmium (filtered)	Chromium (III+VI) (filtered)	Copper (filtered)	Lead (filtered)	Mercury (filtered)	Nickel (filtered)	Zinc (filtered)
MW01		**23/11/2018**	<0.001	<0.0002	0.002	0.002	<0.001	<0.0001	<0.001	<0.005
MW02			<0.001	<0.0002	<0.001	<0.001	<0.001	<0.0001	0.001	<0.005
MW03			<0.001	<0.0002	0.002	0.001	<0.001	<0.0001	0.004	0.006
QA100	**MW02**		<0.001	<0.0002	<0.001	<0.001	<0.001	<0.0001	0.002	<0.005
QA200	**MW02**		<0.001	<0.0001	<0.001	0.001	<0.001	<0.0001	0.001	<0.005

Statistical Summary

	Arsenic (filtered)	Cadmium (filtered)	Chromium (III+VI) (filtered)	Copper (filtered)	Lead (filtered)	Mercury (filtered)	Nickel (filtered)	Zinc (filtered)
Maximum Concentration	**<0.001**	**<0.0002**	**0.002**	**0.002**	**<0.001**	**<0.0001**	**0.004**	**0.006**
Average Concentration *	**<0.001**	**<0.0002**	**0.001**	**0.001**	**<0.001**	**<0.0001**	**0.002**	**0.003**
Standard Deviation *	**0**	**0**	**0.001**	**0.001**	**0**	**0**	**0.001**	**0.002**

* A Non Detect Multiplier of 0.5 has been applied.

	Perfluorocarbons								
	2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)
	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR	5E-05	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01
ANZECC 2000 Marine Water (90%)									
NEPM 2013 Table 1C GILs, Marine Waters									
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand									
2-4m									
4-8m									
>8m									
ANZECC 2000 Irrigation - Long-term trigger value									
PFAS NEMP 2018 Table 5 Interim marine 90%						2			

Field ID	Location	Sample Date									
MW01		**23/11/2018**	<0.00005	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.05	<0.01
MW02			<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01
MW03			<0.00005	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.05	<0.01
QA100	**MW02**		<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01
QA200	**MW02**		<0.00005	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02

Statistical Summary

Maximum Concentration	**<5E-05**	**<0.02**	**<0.02**	**0.02**	**<0.02**	**<0.01**	**<0.02**	**<0.1**	**<0.02**
Average Concentration *	**<5E-06**	**<0.02**	**<0.02**	**0.01**	**<0.02**	**<0.01**	**<0.02**	**<0.1**	**<0.02**
Standard Deviation *	**0**	**0**	**0**	**0.01**	**0**	**0**	**0**	**0**	**0**

* A Non Detect Multiplier of 0.5 has been applied.

Groundwater Analytical Summary
Kyeemagh Infant School
Project: 80818157

	Perfluorocarbons										
	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoate (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.05
ANZECC 2000 Marine Water (90%)											
NEPM 2013 Table 1C GILs, Marine Waters											
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand											
2-4m											
4-8m											
>8m											
ANZECC 2000 Irrigation - Long-term trigger value											
PFAS NEMP 2018 Table 5 Interim marine 90%			632								

Field ID	Location	Sample Date	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA
MW01		**23/11/2018**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05
MW02			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05
MW03			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05
QA100	**MW02**		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05
QA200	**MW02**		<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05

Statistical Summary

	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA
Maximum Concentration	**<0.02**	**<0.02**	**<0.01**	**<0.02**	**<0.02**	**<0.02**	**<0.02**	**<0.02**	**<0.05**	**<0.05**	**<0.05**
Average Concentration *	**<0.02**	**<0.02**	**<0.01**	**<0.02**	**<0.02**	**<0.02**	**<0.02**	**<0.02**	**<0.05**	**<0.05**	**<0.05**
Standard Deviation *	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

* A Non Detect Multiplier of 0.5 has been applied.

Groundwater Analytical Summary
Kyeemagh Infant School
Project: 80818157

DWP Architects
Pyrmont NSW

	Perfluorocarbons										
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FtS)	8:2 Fluorotelomer sulfonate (8:2 FtS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Sum of PFAS	Sum of PFAS (WA DER List)	Sum of PFHxS and PFOS
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR	0.05	0.05	0.02	0.02	0.01	0.05	0.01	0.01	0.01	0.01	0.01
ANZECC 2000 Marine Water (90%)											
NEPM 2013 Table 1C GILs, Marine Waters											
NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand											
2-4m											
4-8m											
>8m											
ANZECC 2000 Irrigation - Long-term trigger value											
PFAS NEMP 2018 Table 5 Interim marine 90%											

Field ID	Location	Sample Date											
MW01		**23/11/2018**	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	<0.05	0.02
MW02			<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	<0.05	<0.01
MW03			<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	<0.05	0.01
QA100	**MW02**		<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	<0.05	<0.01
QA200	**MW02**		<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01

Statistical Summary

Maximum Concentration	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.1**	**<0.05**	**0.02**
Average Concentration *	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.05**	**<0.1**	**<0.05**	**1.02**
Standard Deviation *	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

* A Non Detect Multiplier of 0.5 has been applied.

Rinsate
Kyeemagh Infant School
Project: 80818157

		BTEX											
		Benzene		**Toluene**		**Ethylbenzene**		**Xylene (m & p)**		**Xylene (o)**		**Xylene Total**	
		mg/kg	**µg/L**	**mg/kg**	**µg/L**	**mg/kg**	**µg/L**	**mg/kg**	**µg/L**	**mg/kg**	**µg/L**	**mg/kg**	**µg/L**
LOR		0.1	1	0.1	1	0.1	1	0.2	2	0.1	1	0.3	3
Field ID	**Date**												
KYE_GUM	**17/11/2018**												
KYE_RIN			<1		<1		<1		<2		<1		<3

		TRH								
		C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	TPH C10-C14 Fraction after Silica Cleanup	TPH C15-C28 Fraction after Silica Cleanup	TPH C29-C36 Fraction after Silica Cleanup	C10 - C36 Fraction (sum) (SG)
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR		20	50	100	100	100	50	100	100	100
Field ID	**Date**									
KYE_GUM	**17/11/2018**	<20	<50	<100	<100	<100	<50	<100	<100	<100
KYE_RIN		<20	<50	<100	<100	<100				

Rinsate
Kyeemagh Infant School
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		CRC Care TRH Fractions									
		C6-C10	C10-C16	C16-C34	C34-C40	C10 - C40 (Sum of total)	F1: C6-C10 less BTEX	F2: >C10-C16 less Naphthalene	>C10 - C16 Fraction (SG)	>C16 - C34 Fraction (SG)	>C34 - C40 Fraction (SG)
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR		20	50	100	100	100	20	50	50	100	100
Field ID	**Date**										
KYE_GUM	**17/11/2018**	<20	<50	<100	<100	<100	<20	<50	<50	<100	<100
KYE_RIN		<20	<50	<100	<100	<100	<20	<50			

Rinsate
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		PAH							
		Benzo(b+j)fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR		1	1	1	1	1	1	1	1
Field ID	**Date**								
KYE_GUM	**17/11/2018**								
KYE_RIN		<1	<1	<1	<1	<1	<1	<1	<1

Rinsate
Kyeemagh Infant School
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		PAH								
		Chrysene	**Dibenz(a,h)anthracene**	**Fluoranthene**	**Fluorene**	**Indeno(1,2,3-c,d)pyrene**	**Naphthalene**	**PAHs (Sum of total)**	**Phenanthrene**	**Pyrene**
		µg/L	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
LOR		1	1	1	1	1	1	1	1	1
Field ID	**Date**									
KYE_GUM	**17/11/2018**						<10			
KYE_RIN		<1	<1	<1	<1	<1	<1	<1	<1	<1

		Metals							
		Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR		0.001	0.0002	0.001	0.001	0.001	0.0001	0.001	0.005
Field ID	**Date**								
KYE_GUM	**17/11/2018**								
KYE_RIN		<0.001	<0.0002	<0.001	<0.001	<0.001	<0.0001	<0.001	<0.005

Trip Blank / Trip Spike
Kyeemagh Infant School
Project: 80818157

DWP Architects
Pyrmont NSW

			BTEX					
			Benzene	**Toluene**	**Ethylbenzene**	**Xylene (m & p)**	**Xylene (o)**	**Xylene Total**
			mg/kg	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
	LOR		0.1	0.1	0.1	0.2	0.1	0.3
Site	**Field ID**	**Sample Date**						
Kyeemagh Infant School	**TB**	**17/11/2018**	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
	TS*		83	82	82	83	84	84

*This sample is a Trip Spike and therefore all results are reported as a percentage

RPD Table
Kyeemagh Infant School
Project: 80818157

		Field ID	TP12_0.2	QA100		QA200		TP16_0.1	QA300		QA400	
		Date	10/11/2018	10/11/2018	RPD	10/11/2018	RPD	17/11/2018	17/11/2018	RPD	17/11/2018	RPD
	Unit	LOR										
BTEX												
Benzene	mg/kg	0.1	<0.1	<0.1	0	<0.2	0	<0.1	<0.1	0	<0.2	0
Toluene	mg/kg	0.1	<0.1	<0.1	0	<0.5	0	<0.1	<0.1	0	<0.5	0
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	0	<0.5	0	<0.1	<0.1	0	<0.5	0
Xylene (m & p)	mg/kg	0.2	<0.2	<0.2	0	<0.5	0	<0.2	<0.2	0	<0.5	0
Xylene (o)	mg/kg	0.1	<0.1	<0.1	0	<0.5	0	<0.1	<0.1	0	<0.5	0
Xylene Total	mg/kg	0.3	<0.3	<0.3	0	<0.5	0	<0.3	<0.3	0	<0.5	0
Total BTEX	mg/kg	0.2				<0.2					<0.2	
TRH												
C6 - C9	mg/kg	10	<20	<20	0	<10	0	<20	<20	0	<10	0
C10 - C14	mg/kg	20	<20	<20	0	<50	0	<20	<20	0	<50	0
C15 - C28	mg/kg	50	<50	<50	0	<100	0	<50	<50	0	<100	0
C29-C36	mg/kg	50	<50	<50	0	<100	0	<50	<50	0	<100	0
+C10 - C36 (Sum of total)	mg/kg	50	<50	<50	0	<50	0	<50	<50	0	<50	0
CRC Care TRH Fractions												
C6-C10	mg/kg	10	<20	<20	0	<10	0	<20	<20	0	<10	0
C10-C16	mg/kg	50	<50	<50	0	<50	0	<50	<50	0	<50	0
C16-C34	mg/kg	100	<100	<100	0	<100	0	<100	<100	0	<100	0
C34-C40	mg/kg	100	<100	<100	0	<100	0	<100	<100	0	<100	0
C10 - C40 (Sum of total)	mg/kg	50	<100	<100	0	<50	0	<100	<100	0	<50	0
F1: C6-C10 less BTEX	mg/kg	10	<20	<20	0	<10	0	<20	<20	0	<10	0
F2: >C10-C16 less Naphthalene	mg/kg	50	<50	<50	0	<50	0	<50	<50	0	<50	0
PAH												
Benzo(a)pyrene TEQ (half LOR)_	mg/kg	0.5	0.6	0.6	0	0.6	0	0.6	0.6	0	0.6	0
Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5	1.2	1.2	0	1.2	0	1.2	1.2	0	1.2	0
Benzo(b+j)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	0	<0.5	<0.5	0	<0.5	0
Acenaphthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	0	<0.5	<0.5	0	<0.5	0
Acenaphthylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	0	<0.5	<0.5	0	<0.5	0
Anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	0	<0.5	<0.5	0	<0.5	0
Benz(a)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	0	<0.5	<0.5	0	<0.5	0
BaP TEQ (zero)	mg/kg	0.5	<0.5	<0.5	0	<0.5	0	<0.5	<0.5	0	<0.5	0
Benzo(a)pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	0	<0.5	<0.5	0	<0.5	0
Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	0	<0.5	<0.5	0	<0.5	0
Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	0	<0.5	<0.5	0	<0.5	0
Chrysene	mg/kg	0.5	<0.5	<0.5	0	<0.5	0	<0.5	<0.5	0	<0.5	0
Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	0	<0.5	<0.5	0	<0.5	0
Fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	0	<0.5	<0.5	0	<0.5	0
Fluorene	mg/kg	0.5	<0.5	<0.5	0	<0.5	0	<0.5	<0.5	0	<0.5	0
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	0	<0.5	<0.5	0	<0.5	0
Naphthalene	mg/kg	0.5	<0.5	<0.5	0	<0.5	0	<0.5	<0.5	0	<0.5	0
PAHs (Sum of total)	mg/kg	0.5	<0.5	<0.5	0	<0.5	0	<0.5	<0.5	0	<0.5	0
Phenanthrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	0	<0.5	<0.5	0	<0.5	0
Pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	0	<0.5	<0.5	0	<0.5	0

RPD Table
Kyeemagh Infant School
Project: 80818157

DWP Architects
Pyrmont NSW

		Field ID	TP12_0.2	QA100		QA200		TP16_0.1	QA300		QA400	
		Date	10/11/2018	10/11/2018	RPD	10/11/2018	RPD	17/11/2018	17/11/2018	RPD	17/11/2018	RPD
	Unit	LOR										
Metals												
Arsenic	mg/kg	2	<2	<2	0	<5	0	<2	<2	0	<5	0
Cadmium	mg/kg	0.4	<0.4	<0.4	0	<1	0	<0.4	<0.4	0	<1	0
Chromium (III+VI)	mg/kg	2	<5	<5	0	<2	0	<5	<5	0	<2	0
Copper	mg/kg	5	<5	11	75	<5	0	<5	5.2	4	5	0
Iron	mg/kg	20	630									
Lead	mg/kg	5	13	14	7	8	48	17	19	11	21	21
Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	0	<0.1	<0.1	0	<0.1	0
Nickel	mg/kg	2	<5	<5	0	<2	0	<5	<5	0	<2	0
Zinc	mg/kg	5	17	15	12	10	52	18	20	11	22	20
SVOCs												
EPN	mg/kg	0.2	<0.2	<0.2	0							
Organochlorine Pesticides												
Vic EPA IWRG 621 OCP (Total)*	MG/KG	0.1	<0.1	<0.1	0							
Vic EPA IWRG 621 Other OCP (Total)*	MG/KG	0.1	<0.1	<0.1	0							
4,4-DDE	mg/kg	0.05	<0.05	<0.05	0	<0.05	0					
a-BHC	mg/kg	0.05	<0.05	<0.05	0	<0.05	0					
Aldrin	mg/kg	0.05	<0.05	<0.05	0	<0.05	0					
Aldrin + Dieldrin	mg/kg	0.05	<0.05	<0.05	0	<0.05	0					
b-BHC	mg/kg	0.05	<0.05	<0.05	0	<0.05	0					
Chlordane	mg/kg	0.05	<0.1	<0.1	0	<0.05	0					
Chlordane (cis)	mg/kg	0.05				<0.05						
Chlordane (trans)	mg/kg	0.05				<0.05						
d-BHC	mg/kg	0.05	<0.05	<0.05	0	<0.05	0					
DDD	mg/kg	0.05	<0.05	<0.05	0	<0.05	0					
DDT	mg/kg	0.05	<0.05	<0.05	0	<0.2	0					
DDT+DDE+DDD	mg/kg	0.05	<0.05	<0.05	0	<0.05	0					
Dieldrin	mg/kg	0.05	<0.05	<0.05	0	<0.05	0					
Endosulfan	mg/kg	0.05				<0.05						
Endosulfan I	mg/kg	0.05	<0.05	<0.05	0	<0.05	0					
Endosulfan II	mg/kg	0.05	<0.05	<0.05	0	<0.05	0					
Endosulfan sulphate	mg/kg	0.05	<0.05	<0.05	0	<0.05	0					
Endrin	mg/kg	0.05	<0.05	<0.05	0	<0.05	0					
Endrin aldehyde	mg/kg	0.05	<0.05	<0.05	0	<0.05	0					
Endrin ketone	mg/kg	0.05	<0.05	<0.05	0	<0.05	0					
g-BHC (Lindane)	mg/kg	0.05	<0.05	<0.05	0	<0.05	0					
Heptachlor	mg/kg	0.05	<0.05	<0.05	0	<0.05	0					
Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05	0	<0.05	0					
Hexachlorobenzene	mg/kg	0.05	<0.05	<0.05	0	<0.05	0					
Methoxychlor	mg/kg	0.05	<0.05	<0.05	0	<0.2	0					
Toxaphene	mg/kg	1	<1	<1	0							

		Field ID	TP12_0.2	QA100		QA200		TP16_0.1	QA300		QA400	
		Date	10/11/2018	10/11/2018	RPD	10/11/2018	RPD	17/11/2018	17/11/2018	RPD	17/11/2018	RPD
	Unit	LOR										
Organophosphorous Pesticides												
Tokuthion	mg/kg	0.2	<0.2	<0.2	0							
Azinophos methyl	mg/kg	0.05	<0.2	<0.2	0	<0.05	0					
Bolstar (Sulprofos)	mg/kg	0.2	<0.2	<0.2	0							
Bromophos-ethyl	mg/kg	0.05				<0.05						
Carbophenothion	mg/kg	0.05				<0.05						
Chlorfenvinphos	mg/kg	0.05	<0.2	<0.2	0	<0.05	0					
Chlorpyrifos	mg/kg	0.05	<0.2	<0.2	0	<0.05	0					
Chlorpyrifos-methyl	mg/kg	0.05	<0.2	<0.2	0	<0.05	0					
Coumaphos	mg/kg	2	<2	<2	0							
Demeton-O	mg/kg	0.2	<0.2	<0.2	0							
Demeton-S	mg/kg	0.2	<0.2	<0.2	0							
Diazinon	mg/kg	0.05	<0.2	<0.2	0	<0.05	0					
Dichlorvos	mg/kg	0.05	<0.2	<0.2	0	<0.05	0					
Dimethoate	mg/kg	0.05	<0.2	<0.2	0	<0.05	0					
Disulfoton	mg/kg	0.2	<0.2	<0.2	0							
Ethion	mg/kg	0.05	<0.2	<0.2	0	<0.05	0					
Ethoprop	mg/kg	0.2	<0.2	<0.2	0							
Fenitrothion	mg/kg	0.2	<0.2	<0.2	0							
Fensulfothion	mg/kg	0.2	<0.2	<0.2	0							
Fenthion	mg/kg	0.05	<0.2	<0.2	0	<0.05	0					
Malathion	mg/kg	0.05	<0.2	<0.2	0	<0.05	0					
Merphos	mg/kg	0.2	<0.2	<0.2	0							
Methyl parathion	mg/kg	0.2	<0.2	<0.2	0	<0.2	0					
Mevinphos (Phosdrin)	mg/kg	0.2	<0.2	<0.2	0							
Monocrotophos	mg/kg	0.2	<2	<2	0	<0.2	0					
Naled (Dibrom)	mg/kg	0.2	<0.2	<0.2	0							
Omethoate	mg/kg	2	<2	<2	0							
Phorate	mg/kg	0.2	<0.2	<0.2	0							
Prothiofos	mg/kg	0.05				<0.05						
Pyrazophos	mg/kg	0.2	<0.2	<0.2	0							
Ronnel	mg/kg	0.2	<0.2	<0.2	0							
Terbufos	mg/kg	0.2	<0.2	<0.2	0							
Trichloronate	mg/kg	0.2	<0.2	<0.2	0							
Tetrachlorvinphos	mg/kg	0.2	<0.2	<0.2	0							
Pesticides												
Demeton-S-methyl	mg/kg	0.05				<0.05						
Fenamiphos	mg/kg	0.05				<0.05						
Parathion	mg/kg	0.2	<0.2	<0.2	0	<0.2	0					
Pirimiphos-methyl	mg/kg	0.2	<0.2	<0.2	0							
Pirimphos-ethyl	mg/kg	0.05				<0.05						
Polychlorinated Biphenyls												
Arochlor 1016	mg/kg	0.1	<0.1	<0.1	0							
Arochlor 1221	mg/kg	0.1	<0.1	<0.1	0							
Arochlor 1232	mg/kg	0.1	<0.1	<0.1	0							
Arochlor 1242	mg/kg	0.1	<0.1	<0.1	0							
Arochlor 1248	mg/kg	0.1	<0.1	<0.1	0							
Arochlor 1254	mg/kg	0.1	<0.1	<0.1	0							
Arochlor 1260	mg/kg	0.1	<0.1	<0.1	0							
PCBs (Sum of total)	mg/kg	0.1	<0.1	<0.1	0	<0.1	0					

RPD Table - Groundwater
Kyeemagh Infant School
Project: 80818157

DWP Australia
Kyeemagh NSW

		Lab Report Number	629653	629653		629653	ES1835239	
		Field ID	MW02	QA100	**RPD**	MW02	QA200	**RPD**
		Sampled Date/Time	23/11/2018	23/11/2018		23/11/2018	23/11/2018	
Chemistry Name	**Units**	**LOR**						
BTEX								
Benzene	µg/l	1	<1	<1	0	<1	<1	0
Toluene	µg/l	1 : 2 (Interlab)	<1	<1	0	<1	<2	0
Ethylbenzene	µg/l	1 : 2 (Interlab)	<1	<1	0	<1	<2	0
Xylene (m & p)	µg/l	2	<2	<2	0	<2	<2	0
Xylene (o)	µg/l	1 : 2 (Interlab)	<1	<1	0	<1	<2	0
Xylene Total	µg/l	3 : 2 (Interlab)	<3	<3	0	<3	<2	0
TPH								
C6 - C9	µg/l	20	<20	<20	0	<20	<20	0
C10 - C14	µg/l	50	<50	<50	0	<50	<50	0
C15 - C28	µg/l	100	<100	<100	0	<100	<100	0
C29-C36	µg/l	100 : 50 (Interlab)	<100	<100	0	<100	<50	0
+C10 - C36 (Sum of total)	µg/l	100 : 50 (Interlab)	<100	<100	0	<100	<50	0
CRC Care TPH Fractions								
C6-C10	µg/l	20	<20	<20	0	<20	<20	0
C10-C16	µg/l	50 : 100 (Interlab)	<50	<50	0	<50	<100	0
C16-C34	µg/l	100	<100	<100	0	<100	<100	0
C34-C40	µg/l	100	<100	<100	0	<100	<100	0
C10 - C40 (Sum of total)	µg/l	100	<100	<100	0	<100	<100	0
F1: C6-C10 less BTEX	µg/l	20	<20	<20	0	<20	<20	0
F2: >C10-C16 less Naphthalene	µg/l	50 : 100 (Interlab)	<50	<50	0	<50	<100	0
MAH								
Total MAH	mg/l	0.003	<0.003	<0.003	0	<0.003		
1,2,4-trimethylbenzene	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
1,3,5-trimethylbenzene	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
Isopropylbenzene	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
Styrene	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
PAH								
Benzo(b+j)fluoranthene	µg/l	1	<1	<1	0	<1	<1	0
Acenaphthene	µg/l	1	<1	<1	0	<1	<1	0
Acenaphthylene	µg/l	1	<1	<1	0	<1	<1	0
Anthracene	µg/l	1	<1	<1	0	<1	<1	0
Benz(a)anthracene	µg/l	1	<1	<1	0	<1	<1	0
Benzo(a)pyrene	µg/l	1 : 0.5 (Interlab)	<1	<1	0	<1	<0.5	0
Benzo(g,h,i)perylene	µg/l	1	<1	<1	0	<1	<1	0
Benzo(k)fluoranthene	µg/l	1	<1	<1	0	<1	<1	0
Chrysene	µg/l	1	<1	<1	0	<1	<1	0
Dibenz(a,h)anthracene	µg/l	1	<1	<1	0	<1	<1	0
Fluoranthene	µg/l	1	<1	<1	0	<1	<1	0
Fluorene	µg/l	1	<1	<1	0	<1	<1	0
Indeno(1,2,3-c,d)pyrene	µg/l	1	<1	<1	0	<1	<1	0
Naphthalene	µg/l	10 : 5 (Interlab)	<10	<10	0	<10	<1	0
Naphthalene	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<1	0
PAHs (Sum of total)	µg/l	1 : 0.5 (Interlab)	<1	<1	0	<1	<0.5	0
Phenanthrene	µg/l	1	<1	<1	0	<1	<1	0
Pyrene	µg/l	1	<1	<1	0	<1	<1	0

		Lab Report Number	629653	629653		629653	ES1835239	
		Field ID	MW02	QA100	**RPD**	MW02	QA200	**RPD**
		Sampled Date/Time	23/11/2018	23/11/2018		23/11/2018	23/11/2018	
Metals								
Arsenic (Filtered)	mg/l	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Cadmium (Filtered)	mg/l	0.0002 : 0.0001 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0001	0
Chromium (III+VI) (Filtered)	mg/l	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Copper (Filtered)	mg/l	0.001	<0.001	<0.001	0	<0.001	0.001	0
Lead (Filtered)	mg/l	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Mercury (Filtered)	mg/l	0.0001	<0.0001	<0.0001	0	<0.0001	<0.0001	0
Nickel (Filtered)	mg/l	0.001	0.001	0.002	67	0.001	0.001	0
Zinc (Filtered)	mg/l	0.005	<0.005	<0.005	0	<0.005	<0.005	0
Chlorinated Hydrocarbons								
Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.005	<0.005	<0.005	0	<0.005		
Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.005	<0.005	<0.005	0	<0.005		
1,1,1,2-tetrachloroethane	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
1,1,1-trichloroethane	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
1,1,2,2-tetrachloroethane	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
1,1,2-trichloroethane	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
1,1-dichloroethane	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
1,1-dichloroethene	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
1,2,3-trichloropropane	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
1,2-dichloroethane	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
1,2-dichloropropane	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
1,3-dichloropropane	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
Bromochloromethane	µg/l	1	<1	<1	0	<1		
Bromodichloromethane	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
Bromoform	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
Carbon tetrachloride	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
Chlorodibromomethane	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
Chloroethane	µg/l	1 : 50 (Interlab)	<1	<1	0	<1	<50	0
Chloroform	µg/l	5	<5	<5	0	<5	<5	0
Chloromethane	µg/l	1 : 50 (Interlab)	<1	<1	0	<1	<50	0
cis-1,2-dichloroethene	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
cis-1,3-dichloropropene	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
Dibromomethane	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
Dichloromethane	µg/l	1	<1	<1	0	<1		
Trichloroethene	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
Tetrachloroethene	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
trans-1,2-dichloroethene	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
trans-1,3-dichloropropene	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
Vinyl chloride	µg/l	1 : 50 (Interlab)	<1	<1	0	<1	<50	0
Halogenated Hydrocarbons								
1,2-dibromoethane	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
1,2-dichlorobenzene	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
1,3-dichlorobenzene	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
1,4-dichlorobenzene	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
4-chlorotoluene	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
Bromobenzene	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
Bromomethane	µg/l	1 : 50 (Interlab)	<1	<1	0	<1	<50	0
Chlorobenzene	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
Dichlorodifluoromethane	µg/l	1 : 50 (Interlab)	<1	<1	0	<1	<50	0
Iodomethane	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
Trichlorofluoromethane	µg/l	1 : 50 (Interlab)	<1	<1	0	<1	<50	0

		Lab Report Number	629653	629653		629653	ES1835239	
		Field ID	MW02	QA100	**RPD**	MW02	QA200	**RPD**
		Sampled Date/Time	23/11/2018	23/11/2018		23/11/2018	23/11/2018	
Solvents								
Methyl Ethyl Ketone	µg/l	1 : 50 (Interlab)	<1	<1	0	<1	<50	0
4-Methyl-2-pentanone	µg/l	1 : 50 (Interlab)	<1	<1	0	<1	<50	0
Acetone	µg/l	1	<1	<1	0	<1		
Allyl chloride	µg/l	1	<1	<1	0	<1		
Carbon disulfide	µg/l	1 : 5 (Interlab)	<1	<1	0	<1	<5	0
Perfluorocarbons								
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	mg/l	5e-005	<0.00005	<0.00005	0	<0.00005	<0.00005	0
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01 : 0.02 (Interlab)	<0.01	<0.01	0	<0.01	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01 : 0.02 (Interlab)	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01 : 0.02 (Interlab)	<0.01	<0.01	0	<0.01	<0.02	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01 : 0.02 (Interlab)	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.01 : 0.02 (Interlab)	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorobutanoic acid (PFBA)	µg/L	0.05 : 0.1 (Interlab)	<0.05	<0.05	0	<0.05	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01 : 0.02 (Interlab)	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01 : 0.02 (Interlab)	<0.01	<0.01	0	<0.01	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01 : 0.02 (Interlab)	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorooctanoate (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01 : 0.02 (Interlab)	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01 : 0.02 (Interlab)	<0.01	<0.01	0	<0.01	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01 : 0.02 (Interlab)	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01 : 0.02 (Interlab)	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01 : 0.02 (Interlab)	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01 : 0.05 (Interlab)	<0.01	<0.01	0	<0.01	<0.05	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01 : 0.05 (Interlab)	<0.01	<0.01	0	<0.01	<0.05	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonate (8:2 FtS)	µg/L	0.01 : 0.05 (Interlab)	<0.01	<0.01	0	<0.01	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01 : 0.05 (Interlab)	<0.01	<0.01	0	<0.01	<0.05	0
Sum of PFAS	µg/L	0.1 : 0.01 (Interlab)	<0.1	<0.1	0	<0.1	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0

RPD Duplicates Acceptance Criteria is 30%

In calculating the RPD values, the following protocols are adopted:-

Where both concentrations are above laboratory reporting limits the RPD formula is used;

Where both concentrations are below the laboratory reporting limits, no RPD is calculated; and

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

	A	B	C	D	E	F	G	H	I	J	K	L
1	**UCL Statistics for Uncensored Full Data Sets**											
2												
3	User Selected Options			Kyeemagh Infants School: TRH C16-C34 85% UCL Excluding Hotspots								
4	Date/Time of Computation			ProUCL 5.112/12/2018 5:18:13 PM								
5	From File			627289, 628416, ES1833866, ES1834552								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10												
11	**C0**											
12												
13	**General Statistics**											
14	Total Number of Observations					31	Number of Distinct Observations					4
15							Number of Missing Observations					0
16	Minimum					100	Mean					114.5
17	Maximum					350	Median					100
18	SD					53.47	Std. Error of Mean					9.603
19	Coefficient of Variation					0.467	Skewness					3.901
20												
21	**Normal GOF Test**											
22	Shapiro Wilk Test Statistic					0.308	**Shapiro Wilk GOF Test**					
23	5% Shapiro Wilk Critical Value					0.929	Data Not Normal at 5% Significance Level					
24	Lilliefors Test Statistic					0.51	**Lilliefors GOF Test**					
25	5% Lilliefors Critical Value					0.156	Data Not Normal at 5% Significance Level					
26	**Data Not Normal at 5% Significance Level**											
27												
28	**Assuming Normal Distribution**											
29	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
30	95% Student's-t UCL					130.8	95% Adjusted-CLT UCL (Chen-1995)					137.5
31							95% Modified-t UCL (Johnson-1978)					131.9
32												
33	**Gamma GOF Test**											
34	A-D Test Statistic					10.01	**Anderson-Darling Gamma GOF Test**					
35	5% A-D Critical Value					0.746	Data Not Gamma Distributed at 5% Significance Level					
36	K-S Test Statistic					0.519	**Kolmogorov-Smirnov Gamma GOF Test**					
37	5% K-S Critical Value					0.158	Data Not Gamma Distributed at 5% Significance Level					
38	**Data Not Gamma Distributed at 5% Significance Level**											
39												
40	**Gamma Statistics**											
41	k hat (MLE)					9.316	k star (bias corrected MLE)					8.436
42	Theta hat (MLE)					12.29	Theta star (bias corrected MLE)					13.57
43	nu hat (MLE)					577.6	nu star (bias corrected)					523
44	MLE Mean (bias corrected)					114.5	MLE Sd (bias corrected)					39.43
45							Approximate Chi Square Value (0.05)					471
46	Adjusted Level of Significance					0.0413	Adjusted Chi Square Value					468.3
47												
48	**Assuming Gamma Distribution**											
49	95% Approximate Gamma UCL (use when n>=50))					127.2	95% Adjusted Gamma UCL (use when n<50)					127.9
50												

51	**Lognormal GOF Test**			
52	Shapiro Wilk Test Statistic	0.322	**Shapiro Wilk Lognormal GOF Test**	
53	5% Shapiro Wilk Critical Value	0.929	Data Not Lognormal at 5% Significance Level	
54	Lilliefors Test Statistic	0.515	**Lilliefors Lognormal GOF Test**	
55	5% Lilliefors Critical Value	0.156	Data Not Lognormal at 5% Significance Level	
56	**Data Not Lognormal at 5% Significance Level**			
57				
58	**Lognormal Statistics**			
59	Minimum of Logged Data	4.605	Mean of logged Data	4.686
60	Maximum of Logged Data	5.858	SD of logged Data	0.284
61				
62	**Assuming Lognormal Distribution**			
63	95% H-UCL	123.8	90% Chebyshev (MVUE) UCL	130.3
64	95% Chebyshev (MVUE) UCL	138.2	97.5% Chebyshev (MVUE) UCL	149.2
65	99% Chebyshev (MVUE) UCL	170.8		
66				
67	**Nonparametric Distribution Free UCL Statistics**			
68	**Data do not follow a Discernible Distribution (0.05)**			
69				
70	**Nonparametric Distribution Free UCLs**			
71	95% CLT UCL	130.3	95% Jackknife UCL	130.8
72	95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
73	95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
74	95% BCA Bootstrap UCL	N/A		
75	90% Chebyshev(Mean, Sd) UCL	143.3	95% Chebyshev(Mean, Sd) UCL	156.4
76	97.5% Chebyshev(Mean, Sd) UCL	174.5	99% Chebyshev(Mean, Sd) UCL	210.1
77				
78	**Suggested UCL to Use**			
79	95% Student's-t UCL	130.8	or 95% Modified-t UCL	131.9
80				
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
82	Recommendations are based upon data size, data distribution, and skewness.			
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
85				

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Kyeemagh Infants School: Nickel 95% UCL Excluding Hotspots
Date/Time of Computation	ProUCL 5.112/12/2018 3:11:33 PM
From File	627289, 628416, ES1833866, ES1834552
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

C0

General Statistics

Total Number of Observations	30	Number of Distinct Observations	6
		Number of Missing Observations	0
Minimum	2	Mean	6.287
Maximum	17	Median	5
SD	3.702	Std. Error of Mean	0.676
Coefficient of Variation	0.589	Skewness	1.955

Normal GOF Test

Shapiro Wilk Test Statistic	0.587	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.927	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.469	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.159	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	7.435	95% Adjusted-CLT UCL (Chen-1995)	7.656
		95% Modified-t UCL (Johnson-1978)	7.475

Gamma GOF Test

A-D Test Statistic	5.738	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.749	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.447	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.161	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	4.243	k star (bias corrected MLE)	3.841
Theta hat (MLE)	1.482	Theta star (bias corrected MLE)	1.637
nu hat (MLE)	254.6	nu star (bias corrected)	230.4
MLE Mean (bias corrected)	6.287	MLE Sd (bias corrected)	3.208
		Approximate Chi Square Value (0.05)	196.3
Adjusted Level of Significance	0.041	Adjusted Chi Square Value	194.5

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	7.38	95% Adjusted Gamma UCL (use when n<50)	7.449

	A	B	C	D	E	F	G	H	I	J	K	L
51	**Lognormal GOF Test**											
52	Shapiro Wilk Test Statistic					0.672	**Shapiro Wilk Lognormal GOF Test**					
53	5% Shapiro Wilk Critical Value					0.927	Data Not Lognormal at 5% Significance Level					
54	Lilliefors Test Statistic					0.422	**Lilliefors Lognormal GOF Test**					
55	5% Lilliefors Critical Value					0.159	Data Not Lognormal at 5% Significance Level					
56	**Data Not Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59	Minimum of Logged Data					0.693	Mean of logged Data					1.716
60	Maximum of Logged Data					2.833	SD of logged Data					0.477
61												
62	**Assuming Lognormal Distribution**											
63	95% H-UCL					7.394	90% Chebyshev (MVUE) UCL					7.89
64	95% Chebyshev (MVUE) UCL					8.654	97.5% Chebyshev (MVUE) UCL					9.713
65	99% Chebyshev (MVUE) UCL					11.79						
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution (0.05)**											
69												
70	**Nonparametric Distribution Free UCLs**											
71	95% CLT UCL					7.398	95% Jackknife UCL					7.435
72	95% Standard Bootstrap UCL					7.375	95% Bootstrap-t UCL					7.903
73	95% Hall's Bootstrap UCL					7.467	95% Percentile Bootstrap UCL					7.387
74	95% BCA Bootstrap UCL					7.653						
75	90% Chebyshev(Mean, Sd) UCL					8.314	95% Chebyshev(Mean, Sd) UCL					9.233
76	97.5% Chebyshev(Mean, Sd) UCL					10.51	99% Chebyshev(Mean, Sd) UCL					13.01
77												
78	**Suggested UCL to Use**											
79	95% Student's-t UCL					7.435	or 95% Modified-t UCL					7.475
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	Recommendations are based upon data size, data distribution, and skewness.											
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
85												

	A	B	C	D	E	F	G	H	I	J	K	L
1	**UCL Statistics for Uncensored Full Data Sets**											
2												
3	User Selected Options			Kyeemagh Infatns School: B(a)P In Fill Material 95% UCL								
4	Date/Time of Computation			ProUCL 5.112/12/2018 3:16:45 PM								
5	From File			627289, 628416, ES1833866, ES1834552								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10												
11	C0											
12												
13	**General Statistics**											
14	Total Number of Observations					41	Number of Distinct Observations					3
15							Number of Missing Observations					0
16	Minimum					0.5	Mean					0.515
17	Maximum					0.9	Median					0.5
18	SD					0.0691	Std. Error of Mean					0.0108
19	Coefficient of Variation					0.134	Skewness					5.047
20												
21	**Normal GOF Test**											
22	Shapiro Wilk Test Statistic					0.235	**Shapiro Wilk GOF Test**					
23	5% Shapiro Wilk Critical Value					0.941	Data Not Normal at 5% Significance Level					
24	Lilliefors Test Statistic					0.535	**Lilliefors GOF Test**					
25	5% Lilliefors Critical Value					0.137	Data Not Normal at 5% Significance Level					
26	**Data Not Normal at 5% Significance Level**											
27												
28	**Assuming Normal Distribution**											
29	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
30	95% Student's-t UCL					0.533	95% Adjusted-CLT UCL (Chen-1995)					0.541
31							95% Modified-t UCL (Johnson-1978)					0.534
32												
33	**Gamma GOF Test**											
34	A-D Test Statistic					14.49	**Anderson-Darling Gamma GOF Test**					
35	5% A-D Critical Value					0.747	Data Not Gamma Distributed at 5% Significance Level					
36	K-S Test Statistic					0.538	**Kolmogorov-Smirnov Gamma GOF Test**					
37	5% K-S Critical Value					0.137	Data Not Gamma Distributed at 5% Significance Level					
38	**Data Not Gamma Distributed at 5% Significance Level**											
39												
40	**Gamma Statistics**											
41	k hat (MLE)					79.47	k star (bias corrected MLE)					73.67
42	Theta hat (MLE)					0.00648	Theta star (bias corrected MLE)					0.00699
43	nu hat (MLE)					6516	nu star (bias corrected)					6041
44	MLE Mean (bias corrected)					0.515	MLE Sd (bias corrected)					0.06
45							Approximate Chi Square Value (0.05)					5861
46	Adjusted Level of Significance					0.0441	Adjusted Chi Square Value					5855
47												
48	**Assuming Gamma Distribution**											
49	95% Approximate Gamma UCL (use when n>=50))					0.53	95% Adjusted Gamma UCL (use when n<50)					0.531
50												

	A	B	C	D	E	F	G	H	I	J	K	L
51	**Lognormal GOF Test**											
52	Shapiro Wilk Test Statistic					0.238	**Shapiro Wilk Lognormal GOF Test**					
53	5% Shapiro Wilk Critical Value					0.941	Data Not Lognormal at 5% Significance Level					
54	Lilliefors Test Statistic					0.537	**Lilliefors Lognormal GOF Test**					
55	5% Lilliefors Critical Value					0.137	Data Not Lognormal at 5% Significance Level					
56	**Data Not Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59	Minimum of Logged Data					-0.693	Mean of logged Data					-0.671
60	Maximum of Logged Data					-0.105	SD of logged Data					0.105
61												
62	**Assuming Lognormal Distribution**											
63	95% H-UCL					0.529	90% Chebyshev (MVUE) UCL					0.539
64	95% Chebyshev (MVUE) UCL					0.551	97.5% Chebyshev (MVUE) UCL					0.567
65	99% Chebyshev (MVUE) UCL					0.598						
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution (0.05)**											
69												
70	**Nonparametric Distribution Free UCLs**											
71	95% CLT UCL					0.532	95% Jackknife UCL					0.533
72	95% Standard Bootstrap UCL					N/A	95% Bootstrap-t UCL					N/A
73	95% Hall's Bootstrap UCL					N/A	95% Percentile Bootstrap UCL					N/A
74	95% BCA Bootstrap UCL					N/A						
75	90% Chebyshev(Mean, Sd) UCL					0.547	95% Chebyshev(Mean, Sd) UCL					0.562
76	97.5% Chebyshev(Mean, Sd) UCL					0.582	99% Chebyshev(Mean, Sd) UCL					0.622
77												
78	**Suggested UCL to Use**											
79	95% Student's-t UCL					0.533	or 95% Modified-t UCL					0.534
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	Recommendations are based upon data size, data distribution, and skewness.											
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
85												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Kyeemagh Infants School: Chromium 95% UCL
Date/Time of Computation	ProUCL 5.17/12/2018 11:50:02 AM
From File	627289, 628416, ES1833866, ES1834552
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

C0

General Statistics

Total Number of Observations	41	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	2	Mean	9.329
Maximum	130	Median	5
SD	19.92	Std. Error of Mean	3.112
Coefficient of Variation	2.136	Skewness	5.869

Normal GOF Test

Shapiro Wilk Test Statistic	0.267	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.941	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.412	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.137	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	14.57	95% Adjusted-CLT UCL (Chen-1995)	17.49
		95% Modified-t UCL (Johnson-1978)	15.04

Gamma GOF Test

A-D Test Statistic	9.792	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.772	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.434	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.141	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.249	k star (bias corrected MLE)	1.174
Theta hat (MLE)	7.469	Theta star (bias corrected MLE)	7.947
nu hat (MLE)	102.4	nu star (bias corrected)	96.26
MLE Mean (bias corrected)	9.329	MLE Sd (bias corrected)	8.611
		Approximate Chi Square Value (0.05)	74.63
Adjusted Level of Significance	0.0441	Adjusted Chi Square Value	73.93

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	12.03	95% Adjusted Gamma UCL (use when n<50)	12.15

	A	B	C	D	E	F	G	H	I	J	K	L
51	**Lognormal GOF Test**											
52					Shapiro Wilk Test Statistic	0.561	**Shapiro Wilk Lognormal GOF Test**					
53					5% Shapiro Wilk Critical Value	0.941	Data Not Lognormal at 5% Significance Level					
54					Lilliefors Test Statistic	0.407	**Lilliefors Lognormal GOF Test**					
55					5% Lilliefors Critical Value	0.137	Data Not Lognormal at 5% Significance Level					
56	**Data Not Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59					Minimum of Logged Data	0.693					Mean of logged Data	1.782
60					Maximum of Logged Data	4.868					SD of logged Data	0.67
61												
62	**Assuming Lognormal Distribution**											
63					95% H-UCL	9.218					90% Chebyshev (MVUE) UCL	9.897
64					95% Chebyshev (MVUE) UCL	11.03					97.5% Chebyshev (MVUE) UCL	12.61
65					99% Chebyshev (MVUE) UCL	15.71						
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution (0.05)**											
69												
70	**Nonparametric Distribution Free UCLs**											
71					95% CLT UCL	14.45					95% Jackknife UCL	14.57
72					95% Standard Bootstrap UCL	14.46					95% Bootstrap-t UCL	41.15
73					95% Hall's Bootstrap UCL	32.88					95% Percentile Bootstrap UCL	15.28
74					95% BCA Bootstrap UCL	18.87						
75					90% Chebyshev(Mean, Sd) UCL	18.66					95% Chebyshev(Mean, Sd) UCL	22.89
76					97.5% Chebyshev(Mean, Sd) UCL	28.76					99% Chebyshev(Mean, Sd) UCL	40.29
77												
78	**Suggested UCL to Use**											
79					95% Chebyshev (Mean, Sd) UCL	22.89						
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	Recommendations are based upon data size, data distribution, and skewness.											
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
85												

1	**UCL Statistics for Uncensored Full Data Sets**			
2				
3	User Selected Options	Kyeemagh Infants School: Fill material nickel 95% UCL		
4	Date/Time of Computation	ProUCL 5.112/12/2018 3:01:43 PM		
5	From File	627289, 628416, ES1833866, ES1834552		
6	Full Precision	OFF		
7	Confidence Coefficient	95%		
8	Number of Bootstrap Operations	2000		
9				
10				
11	**C0**			
12				
13	**General Statistics**			
14	Total Number of Observations	30	Number of Distinct Observations	8
15			Number of Missing Observations	0
16	Minimum	2	Mean	11.29
17	Maximum	130	Median	5
18	SD	23.13	Std. Error of Mean	4.222
19	Coefficient of Variation	2.049	Skewness	4.997
20				
21	**Normal GOF Test**			
22	Shapiro Wilk Test Statistic	0.331	**Shapiro Wilk GOF Test**	
23	5% Shapiro Wilk Critical Value	0.927	Data Not Normal at 5% Significance Level	
24	Lilliefors Test Statistic	0.374	**Lilliefors GOF Test**	
25	5% Lilliefors Critical Value	0.159	Data Not Normal at 5% Significance Level	
26	**Data Not Normal at 5% Significance Level**			
27				
28	**Assuming Normal Distribution**			
29	**95% Normal UCL**		**95% UCLs (Adjusted for Skewness)**	
30	95% Student's-t UCL	18.46	95% Adjusted-CLT UCL (Chen-1995)	22.35
31			95% Modified-t UCL (Johnson-1978)	19.1
32				
33	**Gamma GOF Test**			
34	A-D Test Statistic	5.446	**Anderson-Darling Gamma GOF Test**	
35	5% A-D Critical Value	0.774	Data Not Gamma Distributed at 5% Significance Level	
36	K-S Test Statistic	0.421	**Kolmogorov-Smirnov Gamma GOF Test**	
37	5% K-S Critical Value	0.165	Data Not Gamma Distributed at 5% Significance Level	
38	**Data Not Gamma Distributed at 5% Significance Level**			
39				
40	**Gamma Statistics**			
41	k hat (MLE)	1.063	k star (bias corrected MLE)	0.979
42	Theta hat (MLE)	10.62	Theta star (bias corrected MLE)	11.53
43	nu hat (MLE)	63.77	nu star (bias corrected)	58.72
44	MLE Mean (bias corrected)	11.29	MLE Sd (bias corrected)	11.41
45			Approximate Chi Square Value (0.05)	42.11
46	Adjusted Level of Significance	0.041	Adjusted Chi Square Value	41.29
47				
48	**Assuming Gamma Distribution**			
49	95% Approximate Gamma UCL (use when n>=50))	15.74	95% Adjusted Gamma UCL (use when n<50)	16.05
50				

	A	B	C	D	E	F	G	H	I	J	K	L
51	**Lognormal GOF Test**											
52					Shapiro Wilk Test Statistic	0.688	**Shapiro Wilk Lognormal GOF Test**					
53					5% Shapiro Wilk Critical Value	0.927	Data Not Lognormal at 5% Significance Level					
54					Lilliefors Test Statistic	0.401	**Lilliefors Lognormal GOF Test**					
55					5% Lilliefors Critical Value	0.159	Data Not Lognormal at 5% Significance Level					
56	**Data Not Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59					Minimum of Logged Data	0.693					Mean of logged Data	1.884
60					Maximum of Logged Data	4.868					SD of logged Data	0.798
61												
62	**Assuming Lognormal Distribution**											
63					95% H-UCL	12.62					90% Chebyshev (MVUE) UCL	13.24
64					95% Chebyshev (MVUE) UCL	15.19					97.5% Chebyshev (MVUE) UCL	17.89
65					99% Chebyshev (MVUE) UCL	23.21						
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution (0.05)**											
69												
70	**Nonparametric Distribution Free UCLs**											
71					95% CLT UCL	18.23					95% Jackknife UCL	18.46
72					95% Standard Bootstrap UCL	18.16					95% Bootstrap-t UCL	45.5
73					95% Hall's Bootstrap UCL	42.57					95% Percentile Bootstrap UCL	19.42
74					95% BCA Bootstrap UCL	24.23						
75					90% Chebyshev(Mean, Sd) UCL	23.95					95% Chebyshev(Mean, Sd) UCL	29.69
76					97.5% Chebyshev(Mean, Sd) UCL	37.66					99% Chebyshev(Mean, Sd) UCL	53.3
77												
78	**Suggested UCL to Use**											
79					95% Chebyshev (Mean, Sd) UCL	29.69						
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	Recommendations are based upon data size, data distribution, and skewness.											
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
85												

APPENDIX

E

BOREHOLE LOGS

BOREHOLE LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: BH01

Job No: 5017190157
Sheet: 1 of 2

Position: E330215.509 N6241986.553 56 MGA94
Angle from Horizontal: 90°
Surface Elevation: 3.480 m AHD
Rig Type: Ute Mounted Drill Rig
Mounting: Light Vehicle
Driller: TR
Casing Diameter:
Contractor: Stratacore
Data Started: 10/11/18
Date Completed: 10/11/18
Logged By: DD
Checked By: JB

Depth (m)	Method	Resistance	Casing	Water	Sample or Field Test	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
0.10m	AD/T	F-H					Silty SAND: fine grained, grey, with organics	D		TOPSOIL
0.30m							FILL: Gravelly SAND: fine grained, grey, fine to medium grained gravel			FILL
					SPT 1.00 - 1.45 m 4, 4, 6 N=10		Silty SAND: fine grained, grey yellow			MARINE
2.20m				10/11/18	SPT 2.50 - 2.95 m 5, 9, 15 N=24	SP	Silty SAND: fine to medium grained, white yellow	M	MD to D	
	WB				ES 4.00 - 4.45 m BH01 4.00-4.45 ASS SPT 4.00 - 4.45 m 8, 16, 26 N=42			W		
5.50m					5.50 - 5.95 m BH01 5.50-5.95 ASS SPT 5.50 - 5.95 m 17, 19, 19 N=38	SP	SAND: fine to medium grained, pale grey, trace fine grained rounded gravel		D	
7.38m					7.00 - 7.45 m BH01 7.00-7.45 ASS SPT 7.00 - 7.45 m 5, 5, 3 N=8	CI	Silty CLAY: medium plasticity, black, trace fine grained gravel, trace of shells		F to St	7.40 m: HP = 100 Kpa
8.30m					8.50 - 8.95 m BH01 8.50-8.95 ASS SPT 8.50 - 8.95 m 0, 0, 0 N=0	CL-CI	Sandy CLAY: low to medium plasticity, black, fine grained sand, with shell fragments		VS to S	
10.00m										

METHOD
- EX Excavator bucket
- R Ripper
- HA Hand auger
- PT Push tube
- SON Sonic drilling
- AH Air hammer
- PS Percussion sampler
- AS Short spiral auger
- AD/V Solid flight auger: V-Bit
- AD/T Solid flight auger: TC-Bit
- HFA Hollow flight auger
- WB Washbore drilling
- RR Rock roller

PENETRATION
- VE Very Easy (No Resistance)
- E Easy
- F Firm
- H Hard
- VH Very Hard (Refusal)

WATER
- ▽ Water Level on Date shown
- ▶ water inflow
- ◀ water outflow

FIELD TESTS
- SPT - Standard Penetration Test
- HP - Hand/Pocket Penetrometer
- DCP - Dynamic Cone Penetrometer
- PSP - Perth Sand Penetrometer
- MC - Moisture Content
- PBT - Plate Bearing Test
- IMP - Borehole Impression Test
- PID - Photoionisation Detector
- VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
- B - Bulk disturbed sample
- D - Disturbed sample
- ES - Environmental sample
- U - Thin wall tube 'undisturbed'

MOISTURE
- D - Dry
- M - Moist
- W - Wet
- PL - Plastic limit
- LL - Liquid limit
- *w* - Moisture content

SOIL CONSISTENCY
- VS - Very Soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard

RELATIVE DENSITY
- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
- VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO 2.01.4 LIB.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 18/12/2018 14:35 8.30.004 Datgel AGS RTA, Photo, Monitoring Tools

BOREHOLE LOG SHEET

Hole No: BH01

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157
Sheet: 2 of 2

Position: E330215.509 N6241986.553 56 MGA94
Angle from Horizontal: 90°
Surface Elevation: 3.480 m AHD
Rig Type: Ute Mounted Drill Rig
Mounting: Light Vehicle
Driller: TR
Casing Diameter:
Contractor: Stratacore
Data Started: 10/11/18
Date Completed: 10/11/18
Logged By: DD
Checked By: JB

Method	Resistance	Casing	Water	Sample or Field Test	Depth (m)	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
WB	F-H			10.00 - 10.45 m BH01 10.00-10.45 ASS SPT 10.00 - 10.45 m 1, 0, 1 N=1	10.00 – 11.50m	CL-CI	Clayey CLAY: fine to medium, black, low plasticity clay	W	VL	MARINE
				SPT 11.50 - 11.95 m 4, 5, 7 N=12	11.50m – 13.00m	SP	SAND: medium grained, yellow grey		MD	
				SPT 13.00 - 13.45 m 4, 7, 14 N=21	13.00m – 14.60m	SP	Clayey SAND: fine grained, grey, low plasticity clay			
				SPT 14.50 - 14.80 m 26, 30 N=R SPT 16.00 - 16.45 m 0, 8, 30 N=38	14.60m – 16.45m	SP	SAND: fine to medium grained, grey yellow		D to VD	WEATHERED ROCK
					16.45m		TERMINATED AT 16.45 m Target depth			

RL (m AHD): -7, -8, -9, -10, -11, -12, -13, -14, -15, -16
Depth (m): 11, 12, 13, 14, 15, 16, 17, 18, 19

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

- ▽ Water Level on Date shown
- ▶ water inflow
- ◀ water outflow

FIELD TESTS

SPT	Standard Penetration Test
HP	Hand/Pocket Penetrometer
DCP	Dynamic Cone Penetrometer
PSP	Perth Sand Penetrometer
MC	Moisture Content
PBT	Plate Bearing Test
IMP	Borehole Impression Test
PID	Photoionisation Detector
VS	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	Bulk disturbed sample
D	Disturbed sample
ES	Environmental sample
U	Thin wall tube 'undisturbed'

MOISTURE

D	Dry
M	Moist
W	Wet
PL	Plastic limit
LL	Liquid limit
w	Moisture content

SOIL CONSISTENCY

VS	Very Soft
S	Soft
F	Firm
St	Stiff
VSt	Very Stiff
H	Hard

RELATIVE DENSITY

VL	Very Loose
L	Loose
MD	Medium Dense
D	Dense
VD	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

BOREHOLE LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: BH02

Job No: 5017190157
Sheet: 1 of 2

Position: E330177.733 N6242026.438 56 MGA94
Angle from Horizontal: 90°
Surface Elevation: 4.600 m AHD
Rig Type: Ute Mounted Drill Rig
Mounting: Light Vehicle
Driller: TR
Casing Diameter:
Contractor: Stratacore
Data Started: 17/11/18
Date Completed: 17/11/18
Logged By: DD
Checked By: JB

Method	Resistance	Casing	Water	Sample or Field Test	RL (m AHD)	Depth (m)	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
AD/T (0.00 - 3.00)	E					0.00 - 0.10m		Silty SAND: fine to medium grained, black brown, with organics	M		TOPSOIL
					4	0.10 - 1.00m		FILL: Gravelly SAND: fine grained, grey brown, fine to medium grained gravel turning orange brown in colour			FILL
				SPT 1.00 - 1.45 m 3, 4, 5 N=9 D 1.50 - 2.00 m SPT 2.50 - 2.95 m 2, 3, 2 N=5	3 2 1	1.00 - 4.15m	SP	Silty SAND: fine grained, pale brown	D to M	L to MD	MARINE
WB (3.00 -)			07/11/18 (4.0)	SPT 4.00 - 4.45 m 2, 4, 8 N=12 SPT 5.50 - 5.95 m 10, 18, 30 N=48 SPT 7.00 - 7.45 m 21, 4, 4 N=8	0 -1 -2 -3	4.15 - 8.50m	SP	SAND: fine to medium grained, yellow white trace of shell fragments potential ass odour	W	D	
				SPT 8.50 - 8.95 m 0, 0, 0 N=0	-4 -5	8.50m -	CL	Sandy CLAY: low plasticity, black brown, fine grained sand		VS to S	

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽ Water Level on Date shown
► water inflow
◄ water outflow

FIELD TESTS

SPT	Standard Penetration Test
HP	Hand/Pocket Penetrometer
DCP	Dynamic Cone Penetrometer
PSP	Perth Sand Penetrometer
MC	Moisture Content
PBT	Plate Bearing Test
IMP	Borehole Impression Test
PID	Photoionisation Detector
VS	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	Bulk disturbed sample
D	Disturbed sample
ES	Environmental sample
U	Thin wall tube 'undisturbed'

MOISTURE

D	Dry
M	Moist
W	Wet
PL	Plastic limit
LL	Liquid limit
w	Moisture content

SOIL CONSISTENCY

VS	Very Soft
S	Soft
F	Firm
St	Stiff
VSt	Very Stiff
H	Hard

RELATIVE DENSITY

VL	Very Loose
L	Loose
MD	Medium Dense
D	Dense
VD	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

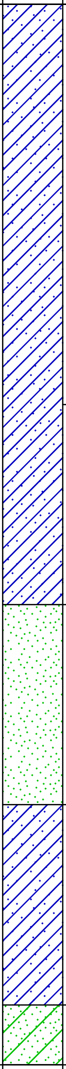
BOREHOLE LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157

Hole No: BH02

Sheet: 2 of 2

Position: E330177.733 N6242026.438 56 MGA94
Angle from Horizontal: 90°
Surface Elevation: 4.600 m AHD
Rig Type: Ute Mounted Drill Rig
Mounting: Light Vehicle
Driller: TR
Casing Diameter:
Contractor: Stratacore
Data Started: 17/11/18
Date Completed: 17/11/18
Logged By: DD
Checked By: JB



Drilling				Sampling & Testing			Material Description					
Method	Resistance	Casing	Water	Sample or Field Test	RL (m AHD)	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
WB	E			SPT 10.00 - 10.45 m 0, 0, 0 N=0 SPT 11.50 - 11.95 m 20, 2, 4 N=6	-6 -7 -8	11 12		CL	Sandy CLAY: low plasticity, black brown, fine grained sand *(continued)*	W	VS to S	MARINE
				SPT 13.00 - 13.45 m 2, 5, 8 N=13	-9	13.00m 13 14		CL-CI	Sandy CLAY: low to medium plasticity, grey, fine grained sand		St	
				SPT 14.50 - 14.68 m 24, 30/30mm N=R	-10 -11	14.50m 15		SP	SAND: medium grained, grey		D to VD	
				SPT 16.00 - 16.45 m 7, 5, 5 N=10	-12	16.00m 16 17		CI-CH	Sandy CLAY: medium to high plasticity, fine grained sand		H	
				SPT 17.50 - 17.95 m 16, 19, 17 N=36	-13	17.50m		SP	Clayey SAND: fine to medium grained, grey, low plasticity clay		D to VD	
					-14 -15	17.95m 18 19			TERMINATED AT 17.95 m Target depth			

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
RR Rock roller

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO 2.01.4 LIB.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 22/01/2019 15:46 8.30.004 Datgel AGS RTA, Photo, Monitoring Tools

BOREHOLE LOG SHEET

Hole No: BH03

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157
Sheet: 1 of 2

Position: E330229.353 N6241972.538 56 MGA94
Angle from Horizontal: 90°
Surface Elevation: 3.830 m AHD
Rig Type: Ute Mounted Drill Rig
Mounting: Light Vehicle
Driller: TR
Casing Diameter:
Contractor: Stratacore
Data Started: 17/11/18
Date Completed: 17/11/18
Logged By: DD
Checked By: JB

Drilling: Method	Drilling: Resistance	Drilling: Casing	Water	Sampling & Testing: Sample or Field Test	Depth (m)	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
AD/T (0.00 - 3.00 m)	E-F				0.10m		SAND: fine to medium grained, dark brown, with organics	D to M		TOPSOIL
				D 0.20 - 0.50 m SPT 1.00 - 1.45 m 1, 3, 3 N=6	1.50m	SP	SAND: fine to medium grained, pale brown			MARINE
				B 2.00 - 2.50 m SPT 2.50 - 2.95 m 2, 7, 10 N=17	4.00m		SAND: fine to medium grained, yellow brown		MD	
WB (3.00 m -)			07/11/18	SPT 4.00 - 4.45 m 6, 20, 22 N=42 SPT 5.50 - 5.95 m 3, 12, 27 N=39 SPT 7.00 - 7.45 m 7, 7, 6 N=13	8.20m	SP	SAND: fine to medium grained, white yellow medium grained sand turning grey in colour	W	MD to D	
				SPT 8.50 - 8.95 m 0, 0, 1 N=1		CL	Sandy CLAY: low plasticity, grey, fine to medium grained sand		VS	

RL (m AHD): 3, 2, 1, 0, -1, -2, -3, -4, -5, -6
Depth (m): 1, 2, 3, 4, 5, 6, 7, 8, 9

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽	Water Level on Date shown
▶	water inflow
◀	water outflow

FIELD TESTS

SPT -	Standard Penetration Test
HP -	Hand/Pocket Penetrometer
DCP -	Dynamic Cone Penetrometer
PSP -	Perth Sand Penetrometer
MC -	Moisture Content
PBT -	Plate Bearing Test
IMP -	Borehole Impression Test
PID -	Photoionisation Detector
VS -	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B -	Bulk disturbed sample
D -	Disturbed sample
ES -	Environmental sample
U -	Thin wall tube 'undisturbed'

MOISTURE

D -	Dry
M -	Moist
W -	Wet
PL -	Plastic limit
LL -	Liquid limit
w -	Moisture content

SOIL CONSISTENCY

VS -	Very Soft
S -	Soft
F -	Firm
St -	Stiff
VSt -	Very Stiff
H -	Hard

RELATIVE DENSITY

VL -	Very Loose
L -	Loose
MD -	Medium Dense
D -	Dense
VD -	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

BOREHOLE LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: BH03

Job No: 5017190157
Sheet: 2 of 2

Position: E330229.353 N6241972.538 56 MGA94
Angle from Horizontal: 90°
Surface Elevation: 3.830 m AHD
Rig Type: Ute Mounted Drill Rig
Mounting: Light Vehicle
Driller: TR
Casing Diameter:
Contractor: Stratacore
Data Started: 17/11/18
Date Completed: 17/11/18
Logged By: DD
Checked By: JB

Drilling				Sampling & Testing			Material Description					
Method	Resistance	Casing	Water	Sample or Field Test	RL (m AHD)	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
WB	E-F			SPT 10.00 - 10.45 m 0, 1, 0 N=1	-7	11	▨	CL	Sandy CLAY: low plasticity, grey, fine to medium grained sand *(continued)*	W	VS	MARINE
				SPT 11.50 - 11.95 m 12, 20, 18 N=38 SPT 13.00 - 13.45 m 12, 5, 8 N=13	-8 -9	12 13	░	SP	11.20m SAND: fine to medium grained, brown		MD to D	
					-10 -11 -12 -13 -14 -15 -16	14 15 16 17 18 19			13.45m TERMINATED AT 13.45 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽	Water Level on Date shown
▶	water inflow
◀	water outflow

FIELD TESTS

SPT	Standard Penetration Test
HP	Hand/Pocket Penetrometer
DCP	Dynamic Cone Penetrometer
PSP	Perth Sand Penetrometer
MC	Moisture Content
PBT	Plate Bearing Test
IMP	Borehole Impression Test
PID	Photoionisation Detector
VS	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	Bulk disturbed sample
D	Disturbed sample
ES	Environmental sample
U	Thin wall tube 'undisturbed'

MOISTURE

D	Dry
M	Moist
W	Wet
PL	Plastic limit
LL	Liquid limit
w	Moisture content

SOIL CONSISTENCY

VS	Very Soft
S	Soft
F	Firm
St	Stiff
VSt	Very Stiff
H	Hard

RELATIVE DENSITY

VL	Very Loose
L	Loose
MD	Medium Dense
D	Dense
VD	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO 2.01.4 LIB.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 18/12/2018 14:36 8.30.004 Datgel AGS RTA, Photo, Monitoring Tools

Cardno

BOREHOLE LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157

Hole No: BH04

Sheet: 1 of 1

Position: E330149.299 N6241929.836 56 MGA94
Angle from Horizontal: 90°
Surface Elevation: 4.380 m AHD
Rig Type: Ute Mounted Drill Rig
Mounting: Light Vehicle
Driller: TR
Casing Diameter:
Contractor: Stratacore
Data Started: 10/11/18
Date Completed: 10/11/18
Logged By: DD
Checked By: JB

Depth (m)	Method	Resistance	Casing	Water	Sample or Field Test	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
0.13m		E		Not Encountered			ASPHALT: corase grained gravel, black	D		PAVEMENT
0.50m							FILL: SAND: fine to medium grained, grey			FILL
1.50m					SPT 0.50 - 0.95 m 0, 0, 0 N=0 B 1.00 - 1.20 m	SP	SAND: fine to medium grained, pale brown		L	MARINE
4.00m					B 1.50 - 2.00 m SPT 1.50 - 1.95 m 3, 5, 6 N=11 SPT 3.00 - 3.45 m 5, 12, 15 N=27	SP	Silty SAND: fine to medium grained, brown Turning white/ pale brown in colour	D D to M	MD	

TERMINATED AT 4.00 m
Refusal
Borehole Refusal Depth Collapse at 4.0m
10/11/18 at 16:20

RL (m AHD): 4, 3, 2, 1, 0, -1, -2, -3, -4, -5
Depth (m): 1, 2, 3, 4, 5, 6, 7, 8, 9

METHOD
- EX Excavator bucket
- R Ripper
- HA Hand auger
- PT Push tube
- SON Sonic drilling
- AH Air hammer
- PS Percussion sampler
- AS Short spiral auger
- AD/V Solid flight auger: V-Bit
- AD/T Solid flight auger: TC-Bit
- HFA Hollow flight auger
- WB Washbore drilling
- RR Rock roller

PENETRATION
- VE Very Easy (No Resistance)
- E Easy
- F Firm
- H Hard
- VH Very Hard (Refusal)

WATER
- ▽ Water Level on Date shown
- ▶ water inflow
- ◀ water outflow

FIELD TESTS
- SPT - Standard Penetration Test
- HP - Hand/Pocket Penetrometer
- DCP - Dynamic Cone Penetrometer
- PSP - Perth Sand Penetrometer
- MC - Moisture Content
- PBT - Plate Bearing Test
- IMP - Borehole Impression Test
- PID - Photoionisation Detector
- VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
- B - Bulk disturbed sample
- D - Disturbed sample
- ES - Environmental sample
- U - Thin wall tube 'undisturbed'

MOISTURE
- D - Dry
- M - Moist
- W - Wet
- PL - Plastic limit
- LL - Liquid limit
- *w* - Moisture content

SOIL CONSISTENCY
- VS - Very Soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard

RELATIVE DENSITY
- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
- VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO 2.01.4 LIB.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 18/12/2018 14:36 8.30.004 Datgel AGS RTA, Photo, Monitoring Tools

Cardno

BOREHOLE LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: BH05

Job No: 5017190157
Sheet: 1 of 1

Position: E330122.818 N6241979.746 56 MGA94
Angle from Horizontal: 90°
Surface Elevation: 4.560 m AHD
Rig Type: Ute Mounted Drill Rig
Mounting: Light Vehicle
Driller: TR
Casing Diameter:
Contractor: Stratacore
Data Started: 10/11/18
Date Completed: 10/11/18
Logged By: DD
Checked By: JB

Drilling				Sampling & Testing			Material Description					
Method	Resistance	Casing	Water	Sample or Field Test	RL (m AHD)	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
AD/T			Not Encountered			0.20m			Gravelly SAND: fine grained, black			TOPSOIL
				D 0.20 - 0.50 m SPT 0.50 - 0.95 m 3, 6, 6 N=12 D 1.00 - 1.10 m SPT 1.50 - 1.95 m 2, 3, 4 N=7		2.00m		SP	Silty SAND: fine grained, dark grey	D	L to MD	MARINE
				SPT 3.00 - 3.45 m 3, 5, 9 N=14		4.50m		SP	Silty SAND: fine grained, brown	D to M	MD	
				SPT 4.50 - 4.95 m 2, 3, 9 N=12		5.50m		SP	SAND: fine to medium grained, pale brown	M	MD	
									TERMINATED AT 5.50 m Target depth			

RL (m AHD): 4, 3, 2, 1, 0, -1, -2, -3, -4, -5
Depth (m): 1, 2, 3, 4, 5, 6, 7, 8, 9

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

- ▽ Water Level on Date shown
- ▶ water inflow
- ◀ water outflow

FIELD TESTS

SPT -	Standard Penetration Test
HP -	Hand/Pocket Penetrometer
DCP -	Dynamic Cone Penetrometer
PSP -	Perth Sand Penetrometer
MC -	Moisture Content
PBT -	Plate Bearing Test
IMP -	Borehole Impression Test
PID -	Photoionisation Detector
VS -	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B -	Bulk disturbed sample
D -	Disturbed sample
ES -	Environmental sample
U -	Thin wall tube 'undisturbed'

MOISTURE

D -	Dry
M -	Moist
W -	Wet
PL -	Plastic limit
LL -	Liquid limit
w -	Moisture content

SOIL CONSISTENCY

VS -	Very Soft
S -	Soft
F -	Firm
St -	Stiff
VSt -	Very Stiff
H -	Hard

RELATIVE DENSITY

VL -	Very Loose
L -	Loose
MD -	Medium Dense
D -	Dense
VD -	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157

Hole No: TP01

Sheet: 1 of 1

Position: E330227.528 N6242031.053 56 MGA94
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX					0.20m			Silty SAND: fine to medium grained, poorly graded, black, with coal ash layer	D		TOPSOIL 0.00 m: PID = 0.1ppm
				ES 0.20 m TP01_0.2 ES 0.90 m TP01_0.9	0.5 0.90m			FILL: SAND: fine to medium grained, uniform, brown yellow grey	M		FILL 0.20 m: PID = 0.0 ppm
					1.0 1.40m			SAND: fine to medium grained, uniform, yellow brown	M	F	MARINE
					1.5 2.0 2.5 3.0 3.5 4.0 4.5			TERMINATED AT 1.40 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽ Water Level on Date shown
▶ water inflow
◀ water outflow

FIELD TESTS

SPT	-	Standard Penetration Test
HP	-	Hand/Pocket Penetrometer
DCP	-	Dynamic Cone Penetrometer
PSP	-	Perth Sand Penetrometer
MC	-	Moisture Content
PBT	-	Plate Bearing Test
IMP	-	Borehole Impression Test
PID	-	Photoionisation Detector
VS	-	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	-	Bulk disturbed sample
D	-	Disturbed sample
ES	-	Environmental sample
U	-	Thin wall tube 'undisturbed'

MOISTURE

D	-	Dry
M	-	Moist
W	-	Wet
PL	-	Plastic limit
LL	-	Liquid limit
w	-	Moisture content

SOIL CONSISTENCY

VS	-	Very Soft
S	-	Soft
F	-	Firm
St	-	Stiff
VSt	-	Very Stiff
H	-	Hard

RELATIVE DENSITY

VL	-	Very Loose
L	-	Loose
MD	-	Medium Dense
D	-	Dense
VD	-	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 03/12/2018 16:17 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

Cardno

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: TP02

Job No: 5017190157
Sheet: 1 of 1

Position: E330192.866 N6242040.364 56 MGA94
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP02_0.1	0.10m			Silty SAND: fine to medium grained, poorly graded, brown grey			TOPSOIL 0.00 m: PID = 3.5 ppm
				ES 0.40 m TP02_0.4	0.40m			FILL: Silty SAND: fine to medium grained, uniform, yellow brown	D		FILL 0.10 m: PID = 8.3 ppm
					0.5 0.90m			SAND: fine to medium grained, uniform, yellow brown	M	F	MARINE
					1.0			TERMINATED AT 0.90 m Target depth			
					1.5						
					2.0						
					2.5						
					3.0						
					3.5						
					4.0						
					4.5						

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽ Water Level on Date shown
▶ water inflow
◀ water outflow

FIELD TESTS

SPT	- Standard Penetration Test
HP	- Hand/Pocket Penetrometer
DCP	- Dynamic Cone Penetrometer
PSP	- Perth Sand Penetrometer
MC	- Moisture Content
PBT	- Plate Bearing Test
IMP	- Borehole Impression Test
PID	- Photoionisation Detector
VS	- Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	- Bulk disturbed sample
D	- Disturbed sample
ES	- Environmental sample
U	- Thin wall tube 'undisturbed'

MOISTURE

D	- Dry
M	- Moist
W	- Wet
PL	- Plastic limit
LL	- Liquid limit
w	- Moisture content

SOIL CONSISTENCY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard

RELATIVE DENSITY

VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 03/12/2018 16:17 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

TEST PIT LOG SHEET

Hole No: TP03

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157
Sheet: 1 of 1

Position: 56 MGA94	**Angle from Horizontal:** 90°	**Surface Elevation:**
Machine Type: 10 tonne Excavator	**Excavation Method:**	
Excavation Dimensions:		**Contractor:**
Date Excavated: 10/11/18	**Logged By:** JG	**Checked By:**

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.20 m TP03_0.2	0.20m			Silty SAND: fine to medium grained, poorly graded, grey brown mottled white	D		TOPSOIL 0.00 m: PID = 0.2ppm
				ES 1.20 m TP03_1.2	0.5 1.0 1.20m			FILL: Silty SAND: fine to medium grained, poorly graded, white grey brown mottled black	D		FILL 0.20 m: PID = 1.2ppm
					1.5 1.70m			SAND: fine to medium grained, uniform, yellow brown	M	F	MARINE
					2.0 2.5 3.0 3.5 4.0 4.5			TERMINATED AT 1.70 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

- ▽ Water Level on Date shown
- ▶ water inflow
- ◀ water outflow

FIELD TESTS

SPT	Standard Penetration Test
HP	Hand/Pocket Penetrometer
DCP	Dynamic Cone Penetrometer
PSP	Perth Sand Penetrometer
MC	Moisture Content
PBT	Plate Bearing Test
IMP	Borehole Impression Test
PID	Photoionisation Detector
VS	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	Bulk disturbed sample
D	Disturbed sample
ES	Environmental sample
U	Thin wall tube 'undisturbed'

MOISTURE

D	Dry
M	Moist
W	Wet
PL	Plastic limit
LL	Liquid limit
w	Moisture content

SOIL CONSISTENCY

VS	Very Soft
S	Soft
F	Firm
St	Stiff
VSt	Very Stiff
H	Hard

RELATIVE DENSITY

VL	Very Loose
L	Loose
MD	Medium Dense
D	Dense
VD	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: TP04

Job No: 5017190157
Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP04_0.1	0.10m			Silty SAND: fine to medium grained, poorly graded, brown black	D		TOPSOIL 0.00 m: PID = 2.6ppm
				ES 0.40 m TP04_0.4	0.40m	▨		FILL: Silty SAND: fine to medium grained, poorly graded, brown grey	D		FILL 0.10 m: PID = 1.7ppm
					0.5 0.90m			SAND: fine to medium grained, uniform, yellow brown	M	F	MARINE
					1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5			TERMINATED AT 0.90 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

- ▽ Water Level on Date shown
- ▶ water inflow
- ◀ water outflow

FIELD TESTS

SPT	- Standard Penetration Test
HP	- Hand/Pocket Penetrometer
DCP	- Dynamic Cone Penetrometer
PSP	- Perth Sand Penetrometer
MC	- Moisture Content
PBT	- Plate Bearing Test
IMP	- Borehole Impression Test
PID	- Photoionisation Detector
VS	- Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	- Bulk disturbed sample
D	- Disturbed sample
ES	- Environmental sample
U	- Thin wall tube 'undisturbed'

MOISTURE

D	- Dry
M	- Moist
W	- Wet
PL	- Plastic limit
LL	- Liquid limit
w	- Moisture content

SOIL CONSISTENCY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard

RELATIVE DENSITY

VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

Cardno

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: TP05

Job No: 5017190157
Sheet: 1 of 1

Position: See attached plan	**Angle from Horizontal:** 90°	**Surface Elevation:**
Machine Type: 10 tonne Excavator	**Excavation Method:**	
Excavation Dimensions:		**Contractor:**
Date Excavated: 10/11/18	**Logged By:** JG	**Checked By:**

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP05_0.1	0.10m	▨		FILL: Silty SAND: fine to medium grained, uniform, grey brown	D		FILL 0.00 m: PID = 3.7ppm
				ES 0.90 m TP05_0.9	0.5 0.90m	░		SAND: fine to medium grained, uniform, white yellow grey	M	F	MARINE 0.10 m: PID = 0.8ppm
					1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5			TERMINATED AT 0.90 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽ Water Level on Date shown
► water inflow
◄ water outflow

FIELD TESTS

SPT -	Standard Penetration Test
HP -	Hand/Pocket Penetrometer
DCP -	Dynamic Cone Penetrometer
PSP -	Perth Sand Penetrometer
MC -	Moisture Content
PBT -	Plate Bearing Test
IMP -	Borehole Impression Test
PID -	Photoionisation Detector
VS -	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B -	Bulk disturbed sample
D -	Disturbed sample
ES -	Environmental sample
U -	Thin wall tube 'undisturbed'

MOISTURE

D -	Dry
M -	Moist
W -	Wet
PL -	Plastic limit
LL -	Liquid limit
w -	Moisture content

SOIL CONSISTENCY

VS -	Very Soft
S -	Soft
F -	Firm
St -	Stiff
VSt -	Very Stiff
H -	Hard

RELATIVE DENSITY

VL -	Very Loose
L -	Loose
MD -	Medium Dense
D -	Dense
VD -	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157

Hole No: TP06

Sheet: 1 of 1

Position: See attached plan	**Angle from Horizontal:** 90°	**Surface Elevation:**
Machine Type: 10 tonne Excavator	**Excavation Method:**	
Excavation Dimensions:		**Contractor:**
Date Excavated: 10/11/18	**Logged By:** JG	**Checked By:**

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP06_0.1	0.10m	⺌⺌		Gravelly SAND: fine grained, poorly graded, brown black, medium to coarse grained gravel	D		TOPSOIL 0.00 m: PID = 1.8ppm
				ES 0.30 m TP06_0.3	0.30m	▩		FILL: GRAVEL: medium, poorly graded, black mottled yellow	D		FILL 0.10 m: PID = 3.4ppm
					0.5 0.80m	⁘		SAND: fine to medium grained, uniform, yellow brown	M	F	MARINE
					1.0			TERMINATED AT 0.80 m Target depth			
					1.5						
					2.0						
					2.5						
					3.0						
					3.5						
					4.0						
					4.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
RR Rock roller

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
▽ Water Level on Date shown
▶ water inflow
◀ water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 03/12/2018 16:17 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

Cardno

TEST PIT LOG SHEET

Hole No: TP07

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157
Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP07_0.1				Silty SAND: fine to medium grained, poorly graded, brown			TOPSOIL 0.00 m: PID = 4.2 ppm
				ES 0.40 m TP07_0.4	0.10m			FILL: Silty SAND: fine to medium grained, uniform, brown	D		FILL 0.10 m: PID = 2.3 ppm
				ES 0.60 m TP07_0.6	0.40m 0.5			FILL: Gravelly SAND: fine to medium grained, gap graded, brown yellow, medium to coarse grained gravel			0.40 m: PID = 1.3 ppm
					0.60m 1.0			SAND: fine to medium grained, uniform, yellow brown	M	F	MARINE
					1.10m 1.5 2.0 2.5 3.0 3.5 4.0 4.5			TERMINATED AT 1.10 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

- ▽ Water Level on Date shown
- ▶ water inflow
- ◀ water outflow

FIELD TESTS

SPT	Standard Penetration Test
HP	Hand/Pocket Penetrometer
DCP	Dynamic Cone Penetrometer
PSP	Perth Sand Penetrometer
MC	Moisture Content
PBT	Plate Bearing Test
IMP	Borehole Impression Test
PID	Photoionisation Detector
VS	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	Bulk disturbed sample
D	Disturbed sample
ES	Environmental sample
U	Thin wall tube 'undisturbed'

MOISTURE

D	Dry
M	Moist
W	Wet
PL	Plastic limit
LL	Liquid limit
w	Moisture content

SOIL CONSISTENCY

VS	Very Soft
S	Soft
F	Firm
St	Stiff
VSt	Very Stiff
H	Hard

RELATIVE DENSITY

VL	Very Loose
L	Loose
MD	Medium Dense
D	Dense
VD	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

Cardno

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: TP08

Job No: 5017190157

Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:

Machine Type: 10 tonne Excavator
Excavation Method:

Excavation Dimensions:
Contractor:

Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP08_0.1	0.10m			Silty SAND: fine to medium grained, gap graded, brown	D		TOPSOIL 0.00 m: PID = 2.9ppm
				ES 0.40 m TP08_0.4	0.40m	▨		FILL: SAND: fine to medium grained, uniform, brown	D		FILL 0.10 m: PID = 4.0ppm
					0.5 0.90m			SAND: fine to medium grained, uniform, yellow brown	M	F	MARINE
					1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5			TERMINATED AT 0.90 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽	Water Level on Date shown
▶	water inflow
◀	water outflow

FIELD TESTS

SPT -	Standard Penetration Test
HP -	Hand/Pocket Penetrometer
DCP -	Dynamic Cone Penetrometer
PSP -	Perth Sand Penetrometer
MC -	Moisture Content
PBT -	Plate Bearing Test
IMP -	Borehole Impression Test
PID -	Photoionisation Detector
VS -	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B -	Bulk disturbed sample
D -	Disturbed sample
ES -	Environmental sample
U -	Thin wall tube 'undisturbed'

MOISTURE

D -	Dry
M -	Moist
W -	Wet
PL -	Plastic limit
LL -	Liquid limit
w -	Moisture content

SOIL CONSISTENCY

VS -	Very Soft
S -	Soft
F -	Firm
St -	Stiff
VSt -	Very Stiff
H -	Hard

RELATIVE DENSITY

VL -	Very Loose
L -	Loose
MD -	Medium Dense
D -	Dense
VD -	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 03/12/2018 16:17 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

Cardno

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157

Hole No: TP09

Sheet: 1 of 1

Position: See attached plan	**Angle from Horizontal:** 90°	**Surface Elevation:**
Machine Type: 10 tonne Excavator	**Excavation Method:**	
Excavation Dimensions:		**Contractor:**
Date Excavated: 10/11/18	**Logged By:** JG	**Checked By:**

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.30 m TP09_0.3			0.30m	Silty SAND: fine to medium grained, uniform, brown yellow	D		TOPSOIL 0.00 m: PID = 3.3ppm
				ES 0.80 m TP09_0.8	0.5		0.80m	SAND: fine to medium grained, uniform, yellow brown	M	F	MARINE 0.30 m: PID = 2.0ppm
					1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5			TERMINATED AT 0.80 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽ Water Level on Date shown
► water inflow
◄ water outflow

FIELD TESTS

SPT	-	Standard Penetration Test
HP	-	Hand/Pocket Penetrometer
DCP	-	Dynamic Cone Penetrometer
PSP	-	Perth Sand Penetrometer
MC	-	Moisture Content
PBT	-	Plate Bearing Test
IMP	-	Borehole Impression Test
PID	-	Photoionisation Detector
VS	-	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	-	Bulk disturbed sample
D	-	Disturbed sample
ES	-	Environmental sample
U	-	Thin wall tube 'undisturbed'

MOISTURE

D	-	Dry
M	-	Moist
W	-	Wet
PL	-	Plastic limit
LL	-	Liquid limit
w	-	Moisture content

SOIL CONSISTENCY

VS	-	Very Soft
S	-	Soft
F	-	Firm
St	-	Stiff
VSt	-	Very Stiff
H	-	Hard

RELATIVE DENSITY

VL	-	Very Loose
L	-	Loose
MD	-	Medium Dense
D	-	Dense
VD	-	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 03/12/2018 16:17 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

Cardno

TEST PIT LOG SHEET

Client:	**DWP Australia**		**Hole No: TP10**
Project:	**Detailed Site Investigation and Geotechnical Investigation**		
Location:	**Kyeemagh Infants School, Kyeemagh, NSW**	**Job No: 5017190157**	**Sheet: 1 of 1**

Position: See attached plan	**Angle from Horizontal: 90°**	**Surface Elevation:**
Machine Type: 10 tonne Excavator	**Excavation Method:**	
Excavation Dimensions:		**Contractor:**
Date Excavated: 10/11/18	**Logged By: JG**	**Checked By:**

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP10_0.1	0.10m			Silty SAND: fine to medium grained, uniform, brown			TOPSOIL 0.00 m: PID = 2.3ppm
				ES 0.40 m TP10_0.4	0.40m			FILL: SAND: fine to medium grained, uniform, brown yellow	D		FILL 0.10 m: PID = 3.4ppm
					0.5 0.90m			SAND: fine to medium grained, uniform, yellow brown	M	F	MARINE
					1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5			TERMINATED AT 0.90 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

- Water Level on Date shown
- ▶ water inflow
- ◀ water outflow

FIELD TESTS

SPT	-	Standard Penetration Test
HP	-	Hand/Pocket Penetrometer
DCP	-	Dynamic Cone Penetrometer
PSP	-	Perth Sand Penetrometer
MC	-	Moisture Content
PBT	-	Plate Bearing Test
IMP	-	Borehole Impression Test
PID	-	Photoionisation Detector
VS	-	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	-	Bulk disturbed sample
D	-	Disturbed sample
ES	-	Environmental sample
U	-	Thin wall tube 'undisturbed'

MOISTURE

D	-	Dry
M	-	Moist
W	-	Wet
PL	-	Plastic limit
LL	-	Liquid limit
w	-	Moisture content

SOIL CONSISTENCY

VS	-	Very Soft
S	-	Soft
F	-	Firm
St	-	Stiff
VSt	-	Very Stiff
H	-	Hard

RELATIVE DENSITY

VL	-	Very Loose
L	-	Loose
MD	-	Medium Dense
D	-	Dense
VD	-	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 03/12/2018 16:17 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157

Hole No: TP11

Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.20 m TP11_0.2	0.20m			Silty SAND: fine to medium grained, uniform, brown white	D		TOPSOIL 0.00 m: PID = 2.0ppm
				ES 1.20 m TP11_1.2	0.5 1.0 1.20m			SAND: fine to medium grained, uniform, yellow brown	M	F	MARINE 0.20 m: PID = 2.5ppm
					1.5 2.0 2.5 3.0 3.5 4.0 4.5			TERMINATED AT 1.20 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

- ▽ Water Level on Date shown
- ▶ water inflow
- ◀ water outflow

FIELD TESTS

SPT	- Standard Penetration Test
HP	- Hand/Pocket Penetrometer
DCP	- Dynamic Cone Penetrometer
PSP	- Perth Sand Penetrometer
MC	- Moisture Content
PBT	- Plate Bearing Test
IMP	- Borehole Impression Test
PID	- Photoionisation Detector
VS	- Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	- Bulk disturbed sample
D	- Disturbed sample
ES	- Environmental sample
U	- Thin wall tube 'undisturbed'

MOISTURE

D	- Dry
M	- Moist
W	- Wet
PL	- Plastic limit
LL	- Liquid limit
w	- Moisture content

SOIL CONSISTENCY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard

RELATIVE DENSITY

VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 03/12/2018 16:17 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Job No: 5017190157

Hole No: TP12

Sheet: 1 of 1

Position: See attached plan	**Angle from Horizontal:** 90°	**Surface Elevation:**
Machine Type: 10 tonne Excavator	**Excavation Method:**	
Excavation Dimensions:		**Contractor:**
Date Excavated: 10/11/18	**Logged By:** JG	**Checked By:**

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.20 m TP12_0.2, QA100, QA200	0.20m	▨		FILL: SAND: fine to medium grained, uniform, brown yellow	D		FILL 0.00 m: PID = 2.2ppm
				ES 1.00 m TP12_1.0	0.5 1.00m	░	SP	SAND: fine to medium grained, uniform, yellow brown		L	MARINE 0.20 m: PID = 2.5ppm
					1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5			TERMINATED AT 1.00 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

- Water Level on Date shown
- ▶ water inflow
- ◀ water outflow

FIELD TESTS

SPT	- Standard Penetration Test
HP	- Hand/Pocket Penetrometer
DCP	- Dynamic Cone Penetrometer
PSP	- Perth Sand Penetrometer
MC	- Moisture Content
PBT	- Plate Bearing Test
IMP	- Borehole Impression Test
PID	- Photoionisation Detector
VS	- Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	- Bulk disturbed sample
D	- Disturbed sample
ES	- Environmental sample
U	- Thin wall tube 'undisturbed'

MOISTURE

D	- Dry
M	- Moist
W	- Wet
PL	- Plastic limit
LL	- Liquid limit
w	- Moisture content

SOIL CONSISTENCY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard

RELATIVE DENSITY

VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157

Hole No: TP13

Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP13_0.1	0.10m			Silty SAND: fine to medium grained, poorly graded, brown grey, trace fine to medium grained gravel	D		TOPSOIL 0.00 m: PID = 0.6 ppm, bricks, concrete chuncks, plastic sheeting
				ES 0.40 m TP13_0.4	0.40m			FILL: SAND: fine to medium grained, gap graded, brown, trace fine to medium grained gravel			FILL 0.10 m: PID = 0.8 ppm, large concrete chunks present
					0.5 0.90m		SP	SAND: fine to medium grained, uniform, yellow brown	M	MD	MARINE
					1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5			TERMINATED AT 0.90 m Target depth			

METHOD
- EX Excavator bucket
- R Ripper
- HA Hand auger
- PT Push tube
- SON Sonic drilling
- AH Air hammer
- PS Percussion sampler
- AS Short spiral auger
- AD/V Solid flight auger: V-Bit
- AD/T Solid flight auger: TC-Bit
- HFA Hollow flight auger
- WB Washbore drilling
- RR Rock roller

PENETRATION
- VE Very Easy (No Resistance)
- E Easy
- F Firm
- H Hard
- VH Very Hard (Refusal)

WATER
- ▽ Water Level on Date shown
- ▶ water inflow
- ◀ water outflow

FIELD TESTS
- SPT - Standard Penetration Test
- HP - Hand/Pocket Penetrometer
- DCP - Dynamic Cone Penetrometer
- PSP - Perth Sand Penetrometer
- MC - Moisture Content
- PBT - Plate Bearing Test
- IMP - Borehole Impression Test
- PID - Photoionisation Detector
- VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
- B - Bulk disturbed sample
- D - Disturbed sample
- ES - Environmental sample
- U - Thin wall tube 'undisturbed'

MOISTURE
- D - Dry
- M - Moist
- W - Wet
- PL - Plastic limit
- LL - Liquid limit
- *w* - Moisture content

SOIL CONSISTENCY
- VS - Very Soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard

RELATIVE DENSITY
- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
- VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: TP14

Job No: 5017190157
Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:

Machine Type: 10 tonne Excavator
Excavation Method:

Excavation Dimensions:
Contractor:

Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP14_0.1	0.10m	▨		FILL: Silty SAND: fine to medium grained, gap graded, grey	D		FILL 0.00 m: PID = 0.6 ppm
				ES 0.70 m TP14_0.7	0.5 0.70m		SP	SAND: fine to medium grained, uniform, grey yellow	M	L	MARINE 0.10 m: PID = 0.7 ppm
					1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5			TERMINATED AT 0.70 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

▽ Water Level on Date shown
► water inflow
◄ water outflow

FIELD TESTS

SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE

D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY

VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY

VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157

Hole No: TP15

Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP15_0.1				0.10m SAND: fine to medium grained, gap graded, grey	D		TOPSOIL 0.00 m: PID = 0.4ppm
				ES 0.60 m TP15_0.6	0.5	▨		0.60m FILL: SAND: fine to medium grained, poorly graded, grey brown	M		FILL 0.10 m: PID = 0.2ppm , large concrete chunk present
					1.0		SP	1.10m SAND: fine to medium grained, uniform, yellow brown		MD	MARINE
					1.5 2.0 2.5 3.0 3.5 4.0 4.5			TERMINATED AT 1.10 m Target depth			

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

- Water Level on Date shown
- water inflow
- water outflow

FIELD TESTS

SPT	Standard Penetration Test
HP	Hand/Pocket Penetrometer
DCP	Dynamic Cone Penetrometer
PSP	Perth Sand Penetrometer
MC	Moisture Content
PBT	Plate Bearing Test
IMP	Borehole Impression Test
PID	Photoionisation Detector
VS	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	Bulk disturbed sample
D	Disturbed sample
ES	Environmental sample
U	Thin wall tube 'undisturbed'

MOISTURE

D	Dry
M	Moist
W	Wet
PL	Plastic limit
LL	Liquid limit
w	Moisture content

SOIL CONSISTENCY

VS	Very Soft
S	Soft
F	Firm
St	Stiff
VSt	Very Stiff
H	Hard

RELATIVE DENSITY

VL	Very Loose
L	Loose
MD	Medium Dense
D	Dense
VD	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157

Hole No: TP16

Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP16_0.1 , QA 300, QA 400	0.10m			Silty SAND: fine to medium grained, poorly graded, grey	D		TOPSOIL 0.00 m: PID = 0.6ppm
				ES 0.80 m TP16_0.8	0.5 0.80m		SP	SAND: fine to medium grained, poorly graded, yellow grey	M	L	MARINE 0.10 m: PID = 0.3ppm
					1.0			TERMINATED AT 0.80 m Target depth			
					1.5						
					2.0						
					2.5						
					3.0						
					3.5						
					4.0						
					4.5						

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

- ▽ Water Level on Date shown
- ▶ water inflow
- ◀ water outflow

FIELD TESTS

SPT	- Standard Penetration Test
HP	- Hand/Pocket Penetrometer
DCP	- Dynamic Cone Penetrometer
PSP	- Perth Sand Penetrometer
MC	- Moisture Content
PBT	- Plate Bearing Test
IMP	- Borehole Impression Test
PID	- Photoionisation Detector
VS	- Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	- Bulk disturbed sample
D	- Disturbed sample
ES	- Environmental sample
U	- Thin wall tube 'undisturbed'

MOISTURE

D	- Dry
M	- Moist
W	- Wet
PL	- Plastic limit
LL	- Liquid limit
w	- Moisture content

SOIL CONSISTENCY

VS	- Very Soft
S	- Soft
F	- Firm
St	- Stiff
VSt	- Very Stiff
H	- Hard

RELATIVE DENSITY

VL	- Very Loose
L	- Loose
MD	- Medium Dense
D	- Dense
VD	- Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 03/12/2018 16:17 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: TP17

Job No: 5017190157
Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation: Method	Excavation: Resistance	Excavation: Stability	Water	Sampling & Testing: Sample or Field Test	Depth (m)	Material Description: Graphic Log	Material Description: Classification	Material Description: SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Material Description: Moisture Condition	Material Description: Consistency Relative Density	Material Description: STRUCTURE & Other Observations
EX				ES 0.10 m TP17_0.1	0.10m			SAND: fine to medium grained, poorly graded, grey brown, silt	D		TOPSOIL 0.00 m: PID = 0.4ppm
				ES 0.50 m TP17_0.5	0.50m		SP	SAND: fine to medium grained, uniform, yellow grey	M	MD	MARINE 0.10 m: PID = 0.4ppm
								TERMINATED AT 0.50 m Target depth			

Depth scale: 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
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VH	Very Hard (Refusal)

WATER

- ▽ Water Level on Date shown
- ▶ water inflow
- ◀ water outflow

FIELD TESTS

SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE

D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY

VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY

VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

CARDNO.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 03/12/2018 16:17 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157

Hole No: TP18

Sheet: 1 of 1

Position: See attached plan | **Angle from Horizontal:** 90° | **Surface Elevation:**
Machine Type: 10 tonne Excavator | **Excavation Method:**
Excavation Dimensions: | **Contractor:**
Date Excavated: 10/11/18 | **Logged By:** JG | **Checked By:**

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP18_0.1				0.10m Silty SAND: fine to medium grained, poorly graded, grey brown	D		TOPSOIL 0.00 m: PID = 0.1ppm
				ES 0.40 m TP18_0.4			SP	0.40m SAND: fine to medium grained, uniform, yellow grey	M	L	MARINE 0.10 m: PID = 0.1ppm
								TERMINATED AT 0.40 m Target depth			
					0.5						
					1.0						
					1.5						
					2.0						
					2.5						
					3.0						
					3.5						
					4.0						
					4.5						

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
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WATER

▽	Water Level on Date shown
►	water inflow
◄	water outflow

FIELD TESTS

SPT -	Standard Penetration Test
HP -	Hand/Pocket Penetrometer
DCP -	Dynamic Cone Penetrometer
PSP -	Perth Sand Penetrometer
MC -	Moisture Content
PBT -	Plate Bearing Test
IMP -	Borehole Impression Test
PID -	Photoionisation Detector
VS -	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B -	Bulk disturbed sample
D -	Disturbed sample
ES -	Environmental sample
U -	Thin wall tube 'undisturbed'

MOISTURE

D -	Dry
M -	Moist
W -	Wet
PL -	Plastic limit
LL -	Liquid limit
w -	Moisture content

SOIL CONSISTENCY

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S -	Soft
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RELATIVE DENSITY

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Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

Cardno

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW

Hole No: TP19

Job No: 5017190157
Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:

Machine Type: 10 tonne Excavator
Excavation Method:

Excavation Dimensions:
Contractor:

Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation				Sampling & Testing		Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP19_0.1				Silty SAND: fine to medium grained, poorly graded, brown grey			TOPSOIL 0.00 m: PID = 0.3ppm
				ES 0.30 m TP19_0.3	0.10m			FILL: Gravelly SAND: fine to medium grained, gap graded, brown grey, fine to medium grained gravel	D		FILL 0.10 m: PID = 3.3ppm
					0.30m 0.5		SP	SAND: fine to medium grained, uniform, yellow grey	M	L	MARINE
					0.80m			TERMINATED AT 0.80 m Target depth			
					1.0						
					1.5						
					2.0						
					2.5						
					3.0						
					3.5						
					4.0						
					4.5						

CARDNO.GLB Log CARDNO NON-CORED KYEEMAGH BOREHOLE LOGS.GPJ <<DrawingFile>> 03/12/2018 16:17 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
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WATER

▽ Water Level on Date shown
▶ water inflow
◀ water outflow

FIELD TESTS

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DCP -	Dynamic Cone Penetrometer
PSP -	Perth Sand Penetrometer
MC -	Moisture Content
PBT -	Plate Bearing Test
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PID -	Photoionisation Detector
VS -	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

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U -	Thin wall tube 'undisturbed'

MOISTURE

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Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD

TEST PIT LOG SHEET

Client: DWP Australia
Project: Detailed Site Investigation and Geotechnical Investigation
Location: Kyeemagh Infants School, Kyeemagh, NSW
Job No: 5017190157

Hole No: TP20

Sheet: 1 of 1

Position: See attached plan
Angle from Horizontal: 90°
Surface Elevation:
Machine Type: 10 tonne Excavator
Excavation Method:
Excavation Dimensions:
Contractor:
Date Excavated: 10/11/18
Logged By: JG
Checked By:

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX				ES 0.10 m TP20_0.1	0.10m			Silty SAND: fine to medium grained, poorly graded, grey	D		TOPSOIL 0.00 m: PID = 0.5ppm
				ES 0.40 m TP20_0.4	0.40m			FILL: SAND: fine to medium grained, uniform, yellow brown	M		FILL 0.10 m: PID = 0.3ppm
					0.5 0.90m		SP	SAND: fine to medium grained, uniform, yellow grey		L	MARINE
					1.0			TERMINATED AT 0.90 m Target depth			
					1.5						
					2.0						
					2.5						
					3.0						
					3.5						
					4.0						
					4.5						

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
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AD/V	Solid flight auger: V-Bit
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PENETRATION

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WATER

- ▽ Water Level on Date shown
- ▶ water inflow
- ◀ water outflow

FIELD TESTS

SPT	Standard Penetration Test
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MC	Moisture Content
PBT	Plate Bearing Test
IMP	Borehole Impression Test
PID	Photoionisation Detector
VS	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	Bulk disturbed sample
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U	Thin wall tube 'undisturbed'

MOISTURE

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SOIL CONSISTENCY

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RELATIVE DENSITY

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MD	Medium Dense
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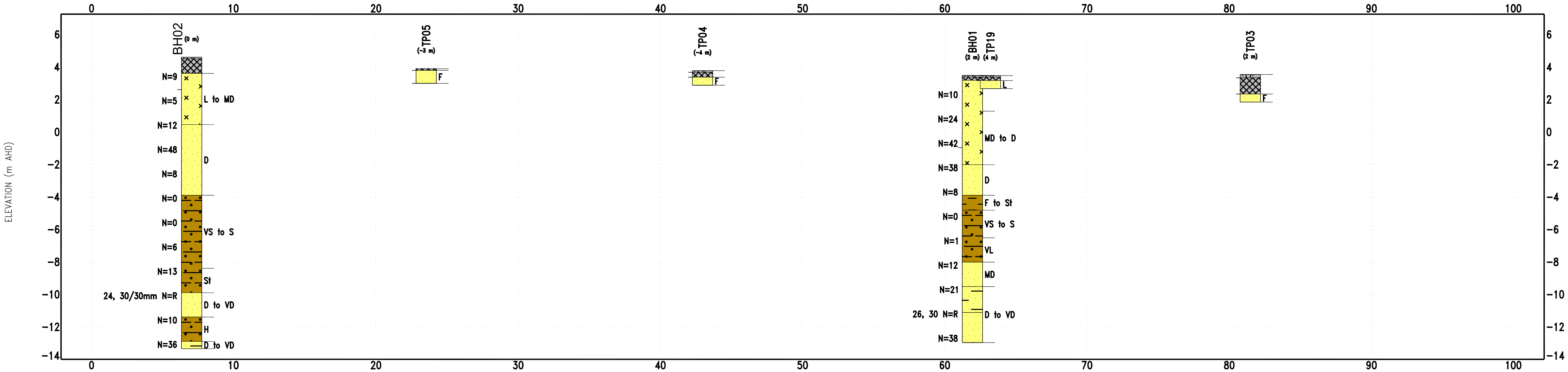
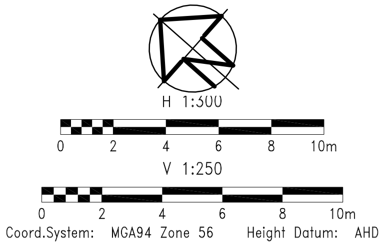
Refer to explanatory notes for details of abbreviations and basis of descriptions

CARDNO (NSW/ACT) PTY LTD





Coord.System: MGA94 Zone 56 Height Datum: AHD

MATERIAL GRAPHIC

TOPSOIL
FILL
Silty SAND
SAND
Silty CLAY
Sandy CLAY
Clayey SAND

INDICATIVE GEOLOGICAL CROSS SECTION
KYEEMAGH INFANTS SCHOOL

Cardno

APPENDIX

F

LABORATORY ANALYTICAL REPORTS

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Cardno (NSW/ACT) Pty Ltd
Level 9, 203 Pacific Highway
St Leonards
NSW 2065

Attention: **Ben Withnall**

Report **627289-S**
Project name KYEEMAGH INFANTS SCHOOL
Project ID 80818157
Received Date Nov 12, 2018

Client Sample ID			**TP03_0.2**	**TP03_1.2**	**TP19_0.1**	**TP19_0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14957**	**S18-No14958**	**S18-No14960**	**S18-No14961**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	-	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	97	-	93	85
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	< 0.5	-	-
1.1-Dichloroethene	0.5	mg/kg	-	< 0.5	-	-
1.1.1-Trichloroethane	0.5	mg/kg	-	< 0.5	-	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	< 0.5	-	-
1.1.2-Trichloroethane	0.5	mg/kg	-	< 0.5	-	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	< 0.5	-	-
1.2-Dibromoethane	0.5	mg/kg	-	< 0.5	-	-
1.2-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	-
1.2-Dichloroethane	0.5	mg/kg	-	< 0.5	-	-
1.2-Dichloropropane	0.5	mg/kg	-	< 0.5	-	-
1.2.3-Trichloropropane	0.5	mg/kg	-	< 0.5	-	-
1.2.4-Trimethylbenzene	0.5	mg/kg	-	< 0.5	-	-
1.3-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	-
1.3-Dichloropropane	0.5	mg/kg	-	< 0.5	-	-
1.3.5-Trimethylbenzene	0.5	mg/kg	-	< 0.5	-	-
1.4-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	-
2-Butanone (MEK)	0.5	mg/kg	-	< 0.5	-	-
2-Propanone (Acetone)	0.5	mg/kg	-	< 0.5	-	-
4-Chlorotoluene	0.5	mg/kg	-	< 0.5	-	-
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	-	< 0.5	-	-
Allyl chloride	0.5	mg/kg	-	< 0.5	-	-

Client Sample ID			**TP03_0.2**	**TP03_1.2**	**TP19_0.1**	**TP19_0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14957**	**S18-No14958**	**S18-No14960**	**S18-No14961**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit				
Volatile Organics						
Benzene	0.1	mg/kg	-	< 0.1	-	-
Bromobenzene	0.5	mg/kg	-	< 0.5	-	-
Bromochloromethane	0.5	mg/kg	-	< 0.5	-	-
Bromodichloromethane	0.5	mg/kg	-	< 0.5	-	-
Bromoform	0.5	mg/kg	-	< 0.5	-	-
Bromomethane	0.5	mg/kg	-	< 0.5	-	-
Carbon disulfide	0.5	mg/kg	-	< 0.5	-	-
Carbon Tetrachloride	0.5	mg/kg	-	< 0.5	-	-
Chlorobenzene	0.5	mg/kg	-	< 0.5	-	-
Chloroethane	0.5	mg/kg	-	< 0.5	-	-
Chloroform	0.5	mg/kg	-	< 0.5	-	-
Chloromethane	0.5	mg/kg	-	< 0.5	-	-
cis-1.2-Dichloroethene	0.5	mg/kg	-	< 0.5	-	-
cis-1.3-Dichloropropene	0.5	mg/kg	-	< 0.5	-	-
Dibromochloromethane	0.5	mg/kg	-	< 0.5	-	-
Dibromomethane	0.5	mg/kg	-	< 0.5	-	-
Dichlorodifluoromethane	0.5	mg/kg	-	< 0.5	-	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	-
Iodomethane	0.5	mg/kg	-	< 0.5	-	-
Isopropyl benzene (Cumene)	0.5	mg/kg	-	< 0.5	-	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	-
Methylene Chloride	0.5	mg/kg	-	< 0.5	-	-
o-Xylene	0.1	mg/kg	-	< 0.1	-	-
Styrene	0.5	mg/kg	-	< 0.5	-	-
Tetrachloroethene	0.5	mg/kg	-	< 0.5	-	-
Toluene	0.1	mg/kg	-	< 0.1	-	-
trans-1.2-Dichloroethene	0.5	mg/kg	-	< 0.5	-	-
trans-1.3-Dichloropropene	0.5	mg/kg	-	< 0.5	-	-
Trichloroethene	0.5	mg/kg	-	< 0.5	-	-
Trichlorofluoromethane	0.5	mg/kg	-	< 0.5	-	-
Vinyl chloride	0.5	mg/kg	-	< 0.5	-	-
Xylenes - Total	0.3	mg/kg	-	< 0.3	-	-
Total MAH*	0.5	mg/kg	-	< 0.5	-	-
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	-	< 0.5	-	-
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	-	< 0.5	-	-
4-Bromofluorobenzene (surr.)	1	%	-	107	-	-
Toluene-d8 (surr.)	1	%	-	99	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**TP03_0.2** **Soil** **S18-No14957** **Nov 10, 2018**	**TP03_1.2** **Soil** **S18-No14958** **Nov 10, 2018**	**TP19_0.1** **Soil** **S18-No14960** **Nov 10, 2018**	**TP19_0.3** **Soil** **S18-No14961** **Nov 10, 2018**
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	92	116	125	134
p-Terphenyl-d14 (surr.)	1	%	117	111	133	149
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.05	mg/kg	< 0.05	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	-	-
Dibutylchlorendate (surr.)	1	%	69	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	57	-	-	-

Client Sample ID			**TP03_0.2**	**TP03_1.2**	**TP19_0.1**	**TP19_0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14957**	**S18-No14958**	**S18-No14960**	**S18-No14961**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	-	-
Bolstar	0.2	mg/kg	< 0.2	-	-	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	-	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	-	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	-	-
Coumaphos	2	mg/kg	< 2	-	-	-
Demeton-S	0.2	mg/kg	< 0.2	-	-	-
Demeton-O	0.2	mg/kg	< 0.2	-	-	-
Diazinon	0.2	mg/kg	< 0.2	-	-	-
Dichlorvos	0.2	mg/kg	< 0.2	-	-	-
Dimethoate	0.2	mg/kg	< 0.2	-	-	-
Disulfoton	0.2	mg/kg	< 0.2	-	-	-
EPN	0.2	mg/kg	< 0.2	-	-	-
Ethion	0.2	mg/kg	< 0.2	-	-	-
Ethoprop	0.2	mg/kg	< 0.2	-	-	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	-	-
Fenitrothion	0.2	mg/kg	< 0.2	-	-	-
Fensulfothion	0.2	mg/kg	< 0.2	-	-	-
Fenthion	0.2	mg/kg	< 0.2	-	-	-
Malathion	0.2	mg/kg	< 0.2	-	-	-
Merphos	0.2	mg/kg	< 0.2	-	-	-
Methyl parathion	0.2	mg/kg	< 0.2	-	-	-
Mevinphos	0.2	mg/kg	< 0.2	-	-	-
Monocrotophos	2	mg/kg	< 2	-	-	-
Naled	0.2	mg/kg	< 0.2	-	-	-
Omethoate	2	mg/kg	< 2	-	-	-
Phorate	0.2	mg/kg	< 0.2	-	-	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	-	-
Pyrazophos	0.2	mg/kg	< 0.2	-	-	-
Ronnel	0.2	mg/kg	< 0.2	-	-	-
Terbufos	0.2	mg/kg	< 0.2	-	-	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	-	-
Tokuthion	0.2	mg/kg	< 0.2	-	-	-
Trichloronate	0.2	mg/kg	< 0.2	-	-	-
Triphenylphosphate (surr.)	1	%	59	-	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1232	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1242	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1248	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1254	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1260	0.1	mg/kg	< 0.1	-	-	-
Total PCB*	0.1	mg/kg	< 0.1	-	-	-
Dibutylchlorendate (surr.)	1	%	69	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	57	-	-	-
% Moisture	1	%	2.8	3.8	1.4	18

Client Sample ID			**TP03_0.2**	**TP03_1.2**	**TP19_0.1**	**TP19_0.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14957**	**S18-No14958**	**S18-No14960**	**S18-No14961**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	< 5	< 5	< 5
Copper	5	mg/kg	6.6	< 5	7.3	10
Lead	5	mg/kg	19	6.2	32	10
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	35	11	29	25

Client Sample ID			**TP01_0.2**	**TP01_0.9**	**TP02_0.1**	**TP02_0.4**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14962**	**S18-No14963**	**S18-No14964**	**S18-No14965**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	63	< 50
TRH C29-C36	50	mg/kg	62	< 50	110	< 50
TRH C10-36 (Total)	50	mg/kg	62	< 50	173	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	89	92	107	95
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	130	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	130	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			**TP01_0.2**	**TP01_0.9**	**TP02_0.1**	**TP02_0.4**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14962**	**S18-No14963**	**S18-No14964**	**S18-No14965**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	121	96	87	86
p-Terphenyl-d14 (surr.)	1	%	115	102	100	93
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	0.7	-
4.4'-DDD	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	-	0.06	-
4.4'-DDT	0.05	mg/kg	-	-	0.06	-
a-BHC	0.05	mg/kg	-	-	< 0.05	-
Aldrin	0.05	mg/kg	-	-	< 0.05	-
b-BHC	0.05	mg/kg	-	-	< 0.05	-
d-BHC	0.05	mg/kg	-	-	< 0.05	-
Dieldrin	0.05	mg/kg	-	-	0.64	-
Endosulfan I	0.05	mg/kg	-	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	-
Endrin	0.05	mg/kg	-	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	-
Endrin ketone	0.05	mg/kg	-	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Methoxychlor	0.05	mg/kg	-	-	< 0.05	-
Toxaphene	1	mg/kg	-	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	0.64	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	0.12	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	1.46	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	0.7	-
Dibutylchlorendate (surr.)	1	%	-	-	84	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	95	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	-	< 0.2	-
Bolstar	0.2	mg/kg	-	-	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	-	-	< 0.2	-
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	-	-	< 0.2	-
Coumaphos	2	mg/kg	-	-	< 2	-
Demeton-S	0.2	mg/kg	-	-	< 0.2	-
Demeton-O	0.2	mg/kg	-	-	< 0.2	-

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**TP01_0.2** **Soil** **S18-No14962** **Nov 10, 2018**	**TP01_0.9** **Soil** **S18-No14963** **Nov 10, 2018**	**TP02_0.1** **Soil** **S18-No14964** **Nov 10, 2018**	**TP02_0.4** **Soil** **S18-No14965** **Nov 10, 2018**
Organophosphorus Pesticides						
Diazinon	0.2	mg/kg	-	-	< 0.2	-
Dichlorvos	0.2	mg/kg	-	-	< 0.2	-
Dimethoate	0.2	mg/kg	-	-	< 0.2	-
Disulfoton	0.2	mg/kg	-	-	< 0.2	-
EPN	0.2	mg/kg	-	-	< 0.2	-
Ethion	0.2	mg/kg	-	-	< 0.2	-
Ethoprop	0.2	mg/kg	-	-	< 0.2	-
Ethyl parathion	0.2	mg/kg	-	-	< 0.2	-
Fenitrothion	0.2	mg/kg	-	-	< 0.2	-
Fensulfothion	0.2	mg/kg	-	-	< 0.2	-
Fenthion	0.2	mg/kg	-	-	< 0.2	-
Malathion	0.2	mg/kg	-	-	< 0.2	-
Merphos	0.2	mg/kg	-	-	< 0.2	-
Methyl parathion	0.2	mg/kg	-	-	< 0.2	-
Mevinphos	0.2	mg/kg	-	-	< 0.2	-
Monocrotophos	2	mg/kg	-	-	< 2	-
Naled	0.2	mg/kg	-	-	< 0.2	-
Omethoate	2	mg/kg	-	-	< 2	-
Phorate	0.2	mg/kg	-	-	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	-	-	< 0.2	-
Pyrazophos	0.2	mg/kg	-	-	< 0.2	-
Ronnel	0.2	mg/kg	-	-	< 0.2	-
Terbufos	0.2	mg/kg	-	-	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	-	-	< 0.2	-
Tokuthion	0.2	mg/kg	-	-	< 0.2	-
Trichloronate	0.2	mg/kg	-	-	< 0.2	-
Triphenylphosphate (surr.)	1	%	-	-	94	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1232	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1242	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1248	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1254	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1260	0.1	mg/kg	-	-	< 0.1	-
Total PCB*	0.1	mg/kg	-	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	-	-	84	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	95	-
% Moisture	1	%	4.0	3.6	5.3	4.7
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	8.8	< 5	18	10
Copper	5	mg/kg	27	< 5	9.4	6.8
Lead	5	mg/kg	19	18	35	8.1
Mercury	0.1	mg/kg	< 0.1	< 0.1	0.7	< 0.1
Nickel	5	mg/kg	15	< 5	15	9.6
Zinc	5	mg/kg	44	20	72	27

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**TP04_0.1** **Soil** **S18-No14966** **Nov 10, 2018**	**TP05_0.1** **Soil** **S18-No14967** **Nov 10, 2018**	**TP05_0.9** **Soil** **S18-No14968** **Nov 10, 2018**	**TP06_0.1** **Soil** **S18-No14969** **Nov 10, 2018**
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	100
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	480
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	580
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	95	80	-	90
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	-	< 0.5	-
1.1-Dichloroethene	0.5	mg/kg	-	-	< 0.5	-
1.1.1-Trichloroethane	0.5	mg/kg	-	-	< 0.5	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	-	< 0.5	-
1.1.2-Trichloroethane	0.5	mg/kg	-	-	< 0.5	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	-	< 0.5	-
1.2-Dibromoethane	0.5	mg/kg	-	-	< 0.5	-
1.2-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	-
1.2-Dichloroethane	0.5	mg/kg	-	-	< 0.5	-
1.2-Dichloropropane	0.5	mg/kg	-	-	< 0.5	-
1.2.3-Trichloropropane	0.5	mg/kg	-	-	< 0.5	-
1.2.4-Trimethylbenzene	0.5	mg/kg	-	-	< 0.5	-
1.3-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	-
1.3-Dichloropropane	0.5	mg/kg	-	-	< 0.5	-
1.3.5-Trimethylbenzene	0.5	mg/kg	-	-	< 0.5	-
1.4-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	-
2-Butanone (MEK)	0.5	mg/kg	-	-	< 0.5	-
2-Propanone (Acetone)	0.5	mg/kg	-	-	< 0.5	-
4-Chlorotoluene	0.5	mg/kg	-	-	< 0.5	-
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	-	-	< 0.5	-
Allyl chloride	0.5	mg/kg	-	-	< 0.5	-
Benzene	0.1	mg/kg	-	-	< 0.1	-
Bromobenzene	0.5	mg/kg	-	-	< 0.5	-
Bromochloromethane	0.5	mg/kg	-	-	< 0.5	-
Bromodichloromethane	0.5	mg/kg	-	-	< 0.5	-
Bromoform	0.5	mg/kg	-	-	< 0.5	-
Bromomethane	0.5	mg/kg	-	-	< 0.5	-
Carbon disulfide	0.5	mg/kg	-	-	< 0.5	-
Carbon Tetrachloride	0.5	mg/kg	-	-	< 0.5	-
Chlorobenzene	0.5	mg/kg	-	-	< 0.5	-
Chloroethane	0.5	mg/kg	-	-	< 0.5	-
Chloroform	0.5	mg/kg	-	-	< 0.5	-
Chloromethane	0.5	mg/kg	-	-	< 0.5	-
cis-1.2-Dichloroethene	0.5	mg/kg	-	-	< 0.5	-
cis-1.3-Dichloropropene	0.5	mg/kg	-	-	< 0.5	-

Client Sample ID			**TP04_0.1**	**TP05_0.1**	**TP05_0.9**	**TP06_0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14966**	**S18-No14967**	**S18-No14968**	**S18-No14969**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit				
Volatile Organics						
Dibromochloromethane	0.5	mg/kg	-	-	< 0.5	-
Dibromomethane	0.5	mg/kg	-	-	< 0.5	-
Dichlorodifluoromethane	0.5	mg/kg	-	-	< 0.5	-
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	-
Iodomethane	0.5	mg/kg	-	-	< 0.5	-
Isopropyl benzene (Cumene)	0.5	mg/kg	-	-	< 0.5	-
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	-
Methylene Chloride	0.5	mg/kg	-	-	< 0.5	-
o-Xylene	0.1	mg/kg	-	-	< 0.1	-
Styrene	0.5	mg/kg	-	-	< 0.5	-
Tetrachloroethene	0.5	mg/kg	-	-	< 0.5	-
Toluene	0.1	mg/kg	-	-	< 0.1	-
trans-1.2-Dichloroethene	0.5	mg/kg	-	-	< 0.5	-
trans-1.3-Dichloropropene	0.5	mg/kg	-	-	< 0.5	-
Trichloroethene	0.5	mg/kg	-	-	< 0.5	-
Trichlorofluoromethane	0.5	mg/kg	-	-	< 0.5	-
Vinyl chloride	0.5	mg/kg	-	-	< 0.5	-
Xylenes - Total	0.3	mg/kg	-	-	< 0.3	-
Total MAH*	0.5	mg/kg	-	-	< 0.5	-
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	-	-	< 0.5	-
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	-	-	< 0.5	-
4-Bromofluorobenzene (surr.)	1	%	-	-	101	-
Toluene-d8 (surr.)	1	%	-	-	98	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	350
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	520
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	870
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	TP04_0.1 Soil S18-No14966 Nov 10, 2018	TP05_0.1 Soil S18-No14967 Nov 10, 2018	TP05_0.9 Soil S18-No14968 Nov 10, 2018	TP06_0.1 Soil S18-No14969 Nov 10, 2018
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	88	102	110	88
p-Terphenyl-d14 (surr.)	1	%	87	119	126	92
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.05	mg/kg	< 0.05	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	-	-
Dibutylchlorendate (surr.)	1	%	79	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	65	-	-	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	-	-
Bolstar	0.2	mg/kg	< 0.2	-	-	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	-	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	-	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	-	-
Coumaphos	2	mg/kg	< 2	-	-	-
Demeton-S	0.2	mg/kg	< 0.2	-	-	-
Demeton-O	0.2	mg/kg	< 0.2	-	-	-
Diazinon	0.2	mg/kg	< 0.2	-	-	-
Dichlorvos	0.2	mg/kg	< 0.2	-	-	-
Dimethoate	0.2	mg/kg	< 0.2	-	-	-
Disulfoton	0.2	mg/kg	< 0.2	-	-	-
EPN	0.2	mg/kg	< 0.2	-	-	-
Ethion	0.2	mg/kg	< 0.2	-	-	-

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**TP04_0.1** **Soil** **S18-No14966** **Nov 10, 2018**	**TP05_0.1** **Soil** **S18-No14967** **Nov 10, 2018**	**TP05_0.9** **Soil** **S18-No14968** **Nov 10, 2018**	**TP06_0.1** **Soil** **S18-No14969** **Nov 10, 2018**
Organophosphorus Pesticides						
Ethoprop	0.2	mg/kg	< 0.2	-	-	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	-	-
Fenitrothion	0.2	mg/kg	< 0.2	-	-	-
Fensulfothion	0.2	mg/kg	< 0.2	-	-	-
Fenthion	0.2	mg/kg	< 0.2	-	-	-
Malathion	0.2	mg/kg	< 0.2	-	-	-
Merphos	0.2	mg/kg	< 0.2	-	-	-
Methyl parathion	0.2	mg/kg	< 0.2	-	-	-
Mevinphos	0.2	mg/kg	< 0.2	-	-	-
Monocrotophos	2	mg/kg	< 2	-	-	-
Naled	0.2	mg/kg	< 0.2	-	-	-
Omethoate	2	mg/kg	< 2	-	-	-
Phorate	0.2	mg/kg	< 0.2	-	-	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	-	-
Pyrazophos	0.2	mg/kg	< 0.2	-	-	-
Ronnel	0.2	mg/kg	< 0.2	-	-	-
Terbufos	0.2	mg/kg	< 0.2	-	-	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	-	-
Tokuthion	0.2	mg/kg	< 0.2	-	-	-
Trichloronate	0.2	mg/kg	< 0.2	-	-	-
Triphenylphosphate (surr.)	1	%	112	-	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1232	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1242	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1248	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1254	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1260	0.1	mg/kg	< 0.1	-	-	-
Total PCB*	0.1	mg/kg	< 0.1	-	-	-
Dibutylchlorendate (surr.)	1	%	79	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	65	-	-	-
% Clay	1	%	-	-	< 1	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	-	12	-
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	-	5.9	-
Total Organic Carbon	0.1	%	-	-	0.1	-
% Moisture	1	%	2.4	4.5	4.3	6.6
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	< 2	2.8
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	< 5	< 5	130
Copper	5	mg/kg	8.7	5.2	< 5	37
Iron	20	mg/kg	-	-	360	-
Lead	5	mg/kg	38	23	< 5	8.1
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	130
Zinc	5	mg/kg	36	23	< 5	86
Heavy Metals						
Iron (%)	0.01	%	-	-	0.04	-

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**TP04_0.1** **Soil** **S18-No14966** **Nov 10, 2018**	**TP05_0.1** **Soil** **S18-No14967** **Nov 10, 2018**	**TP05_0.9** **Soil** **S18-No14968** **Nov 10, 2018**	**TP06_0.1** **Soil** **S18-No14969** **Nov 10, 2018**
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	0.76	-

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**TP06_0.3** **Soil** **S18-No14970** **Nov 10, 2018**	**TP07_0.1** **Soil** **S18-No14971** **Nov 10, 2018**	**TP07_0.4** **Soil** **S18-No14972** **Nov 10, 2018**	**TP07_0.6** **Soil** **S18-No14973** **Nov 10, 2018**
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	-	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	98	114	93
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
1.1.1-Trichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.2-Trichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dibromoethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.2.3-Trichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.2.4-Trimethylbenzene	0.5	mg/kg	< 0.5	-	-	-
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
1.3-Dichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.3.5-Trimethylbenzene	0.5	mg/kg	< 0.5	-	-	-
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
2-Butanone (MEK)	0.5	mg/kg	< 0.5	-	-	-
2-Propanone (Acetone)	0.5	mg/kg	< 0.5	-	-	-
4-Chlorotoluene	0.5	mg/kg	< 0.5	-	-	-
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	< 0.5	-	-	-
Allyl chloride	0.5	mg/kg	< 0.5	-	-	-
Benzene	0.1	mg/kg	< 0.1	-	-	-
Bromobenzene	0.5	mg/kg	< 0.5	-	-	-
Bromochloromethane	0.5	mg/kg	< 0.5	-	-	-
Bromodichloromethane	0.5	mg/kg	< 0.5	-	-	-
Bromoform	0.5	mg/kg	< 0.5	-	-	-

Client Sample ID			**TP06_0.3**	**TP07_0.1**	**TP07_0.4**	**TP07_0.6**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14970**	**S18-No14971**	**S18-No14972**	**S18-No14973**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit				
Volatile Organics						
Bromomethane	0.5	mg/kg	< 0.5	-	-	-
Carbon disulfide	0.5	mg/kg	< 0.5	-	-	-
Carbon Tetrachloride	0.5	mg/kg	< 0.5	-	-	-
Chlorobenzene	0.5	mg/kg	< 0.5	-	-	-
Chloroethane	0.5	mg/kg	< 0.5	-	-	-
Chloroform	0.5	mg/kg	< 0.5	-	-	-
Chloromethane	0.5	mg/kg	< 0.5	-	-	-
cis-1.2-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
cis-1.3-Dichloropropene	0.5	mg/kg	< 0.5	-	-	-
Dibromochloromethane	0.5	mg/kg	< 0.5	-	-	-
Dibromomethane	0.5	mg/kg	< 0.5	-	-	-
Dichlorodifluoromethane	0.5	mg/kg	< 0.5	-	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	-	-
Iodomethane	0.5	mg/kg	< 0.5	-	-	-
Isopropyl benzene (Cumene)	0.5	mg/kg	< 0.5	-	-	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	-	-
Methylene Chloride	0.5	mg/kg	< 0.5	-	-	-
o-Xylene	0.1	mg/kg	< 0.1	-	-	-
Styrene	0.5	mg/kg	< 0.5	-	-	-
Tetrachloroethene	0.5	mg/kg	< 0.5	-	-	-
Toluene	0.1	mg/kg	< 0.1	-	-	-
trans-1.2-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
trans-1.3-Dichloropropene	0.5	mg/kg	< 0.5	-	-	-
Trichloroethene	0.5	mg/kg	< 0.5	-	-	-
Trichlorofluoromethane	0.5	mg/kg	< 0.5	-	-	-
Vinyl chloride	0.5	mg/kg	< 0.5	-	-	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	-	-
Total MAH*	0.5	mg/kg	< 0.5	-	-	-
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	< 0.5	-	-	-
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	< 0.5	-	-	-
4-Bromofluorobenzene (surr.)	1	%	100	-	-	-
Toluene-d8 (surr.)	1	%	94	-	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	TP06_0.3 Soil S18-No14970 Nov 10, 2018	TP07_0.1 Soil S18-No14971 Nov 10, 2018	TP07_0.4 Soil S18-No14972 Nov 10, 2018	TP07_0.6 Soil S18-No14973 Nov 10, 2018
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	101	90	100	105
p-Terphenyl-d14 (surr.)	1	%	104	98	111	120
% Clay	1	%	-	-	< 1	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	-	58	-
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	-	5.8	-
Total Organic Carbon	0.1	%	-	-	0.6	-
% Moisture	1	%	7.7	7.7	2.1	24
Heavy Metals						
Arsenic	2	mg/kg	< 2	2.5	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	13	6.4	< 5	< 5
Copper	5	mg/kg	16	8.4	< 5	13
Iron	20	mg/kg	-	-	1500	-
Lead	5	mg/kg	11	17	11	9.0
Mercury	0.1	mg/kg	< 0.1	1.5	0.2	0.7
Nickel	5	mg/kg	17	< 5	< 5	< 5
Zinc	5	mg/kg	26	46	15	20
Heavy Metals						
Iron (%)	0.01	%	-	-	0.15	-
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	2.8	-

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	TP08_0.4 Soil S18-No14974 Nov 10, 2018	TP09_0.3 Soil S18-No14975 Nov 10, 2018	TP10_0.1 Soil S18-No14976 Nov 10, 2018	TP11_0.2 Soil S18-No14977 Nov 10, 2018
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	91	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	91	< 50

Client Sample ID			**TP08_0.4**	**TP09_0.3**	**TP10_0.1**	**TP11_0.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14974**	**S18-No14975**	**S18-No14976**	**S18-No14977**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	-	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	113	106	103
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
1.1.1-Trichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.2-Trichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dibromoethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.2.3-Trichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.2.4-Trimethylbenzene	0.5	mg/kg	< 0.5	-	-	-
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
1.3-Dichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.3.5-Trimethylbenzene	0.5	mg/kg	< 0.5	-	-	-
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
2-Butanone (MEK)	0.5	mg/kg	< 0.5	-	-	-
2-Propanone (Acetone)	0.5	mg/kg	< 0.5	-	-	-
4-Chlorotoluene	0.5	mg/kg	< 0.5	-	-	-
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	< 0.5	-	-	-
Allyl chloride	0.5	mg/kg	< 0.5	-	-	-
Benzene	0.1	mg/kg	< 0.1	-	-	-
Bromobenzene	0.5	mg/kg	< 0.5	-	-	-
Bromochloromethane	0.5	mg/kg	< 0.5	-	-	-
Bromodichloromethane	0.5	mg/kg	< 0.5	-	-	-
Bromoform	0.5	mg/kg	< 0.5	-	-	-
Bromomethane	0.5	mg/kg	< 0.5	-	-	-
Carbon disulfide	0.5	mg/kg	< 0.5	-	-	-
Carbon Tetrachloride	0.5	mg/kg	< 0.5	-	-	-
Chlorobenzene	0.5	mg/kg	< 0.5	-	-	-
Chloroethane	0.5	mg/kg	< 0.5	-	-	-
Chloroform	0.5	mg/kg	< 0.5	-	-	-
Chloromethane	0.5	mg/kg	< 0.5	-	-	-
cis-1.2-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
cis-1.3-Dichloropropene	0.5	mg/kg	< 0.5	-	-	-
Dibromochloromethane	0.5	mg/kg	< 0.5	-	-	-
Dibromomethane	0.5	mg/kg	< 0.5	-	-	-
Dichlorodifluoromethane	0.5	mg/kg	< 0.5	-	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	-	-
Iodomethane	0.5	mg/kg	< 0.5	-	-	-
Isopropyl benzene (Cumene)	0.5	mg/kg	< 0.5	-	-	-

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**TP08_0.4** **Soil** **S18-No14974** **Nov 10, 2018**	**TP09_0.3** **Soil** **S18-No14975** **Nov 10, 2018**	**TP10_0.1** **Soil** **S18-No14976** **Nov 10, 2018**	**TP11_0.2** **Soil** **S18-No14977** **Nov 10, 2018**
Volatile Organics						
m&p-Xylenes	0.2	mg/kg	< 0.2	-	-	-
Methylene Chloride	0.5	mg/kg	< 0.5	-	-	-
o-Xylene	0.1	mg/kg	< 0.1	-	-	-
Styrene	0.5	mg/kg	< 0.5	-	-	-
Tetrachloroethene	0.5	mg/kg	< 0.5	-	-	-
Toluene	0.1	mg/kg	< 0.1	-	-	-
trans-1.2-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
trans-1.3-Dichloropropene	0.5	mg/kg	< 0.5	-	-	-
Trichloroethene	0.5	mg/kg	< 0.5	-	-	-
Trichlorofluoromethane	0.5	mg/kg	< 0.5	-	-	-
Vinyl chloride	0.5	mg/kg	< 0.5	-	-	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	-	-
Total MAH*	0.5	mg/kg	< 0.5	-	-	-
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	< 0.5	-	-	-
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	< 0.5	-	-	-
4-Bromofluorobenzene (surr.)	1	%	103	-	-	-
Toluene-d8 (surr.)	1	%	97	-	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	150	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	150	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	105	100	112	102
p-Terphenyl-d14 (surr.)	1	%	118	114	129	122

Client Sample ID			**TP08_0.4**	**TP09_0.3**	**TP10_0.1**	**TP11_0.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14974**	**S18-No14975**	**S18-No14976**	**S18-No14977**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-BHC	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-BHC	0.05	mg/kg	-	-	-	< 0.05
d-BHC	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.05	mg/kg	-	-	-	< 0.05
Toxaphene	1	mg/kg	-	-	-	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	-	-	70
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	73
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	-	-	< 0.2
Bolstar	0.2	mg/kg	-	-	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	-	-	< 0.2
Chlorpyrifos	0.2	mg/kg	-	-	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	-	-	< 0.2
Coumaphos	2	mg/kg	-	-	-	< 2
Demeton-S	0.2	mg/kg	-	-	-	< 0.2
Demeton-O	0.2	mg/kg	-	-	-	< 0.2
Diazinon	0.2	mg/kg	-	-	-	< 0.2
Dichlorvos	0.2	mg/kg	-	-	-	< 0.2
Dimethoate	0.2	mg/kg	-	-	-	< 0.2
Disulfoton	0.2	mg/kg	-	-	-	< 0.2
EPN	0.2	mg/kg	-	-	-	< 0.2
Ethion	0.2	mg/kg	-	-	-	< 0.2
Ethoprop	0.2	mg/kg	-	-	-	< 0.2
Ethyl parathion	0.2	mg/kg	-	-	-	< 0.2
Fenitrothion	0.2	mg/kg	-	-	-	< 0.2
Fensulfothion	0.2	mg/kg	-	-	-	< 0.2
Fenthion	0.2	mg/kg	-	-	-	< 0.2
Malathion	0.2	mg/kg	-	-	-	< 0.2
Merphos	0.2	mg/kg	-	-	-	< 0.2

Client Sample ID			**TP08_0.4**	**TP09_0.3**	**TP10_0.1**	**TP11_0.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14974**	**S18-No14975**	**S18-No14976**	**S18-No14977**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Methyl parathion	0.2	mg/kg	-	-	-	< 0.2
Mevinphos	0.2	mg/kg	-	-	-	< 0.2
Monocrotophos	2	mg/kg	-	-	-	< 2
Naled	0.2	mg/kg	-	-	-	< 0.2
Omethoate	2	mg/kg	-	-	-	< 2
Phorate	0.2	mg/kg	-	-	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	-	-	< 0.2
Pyrazophos	0.2	mg/kg	-	-	-	< 0.2
Ronnel	0.2	mg/kg	-	-	-	< 0.2
Terbufos	0.2	mg/kg	-	-	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	-	-	< 0.2
Tokuthion	0.2	mg/kg	-	-	-	< 0.2
Trichloronate	0.2	mg/kg	-	-	-	< 0.2
Triphenylphosphate (surr.)	1	%	-	-	-	104
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1221	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1232	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1242	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1248	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1254	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1260	0.1	mg/kg	-	-	-	< 0.1
Total PCB*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	-	-	70
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	73
% Moisture	1	%	5.4	2.5	4.3	1.5
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	< 5	< 5	< 5
Copper	5	mg/kg	< 5	< 5	< 5	< 5
Lead	5	mg/kg	7.3	10	10	< 5
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	10	14	21	< 5

Client Sample ID			**TP11_1.2**	**TP12_0.2**	**QA100**	**BH4_0.4**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14978**	**S18-No14979**	**S18-No14980**	**S18-No14981**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	72	< 50	< 50	370
TRH C29-C36	50	mg/kg	92	< 50	< 50	1600
TRH C10-36 (Total)	50	mg/kg	164	< 50	< 50	1970

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**TP11_1.2** **Soil** **S18-No14978** **Nov 10, 2018**	**TP12_0.2** **Soil** **S18-No14979** **Nov 10, 2018**	**QA100** **Soil** **S18-No14980** **Nov 10, 2018**	**BH4_0.4** **Soil** **S18-No14981** **Nov 10, 2018**
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	-	< 0.1
Xylenes - Total	0.3	mg/kg	-	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	114	-	112
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	< 0.5	-	< 0.5	-
1.1-Dichloroethene	0.5	mg/kg	< 0.5	-	< 0.5	-
1.1.1-Trichloroethane	0.5	mg/kg	< 0.5	-	< 0.5	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	< 0.5	-	< 0.5	-
1.1.2-Trichloroethane	0.5	mg/kg	< 0.5	-	< 0.5	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	< 0.5	-	< 0.5	-
1.2-Dibromoethane	0.5	mg/kg	< 0.5	-	< 0.5	-
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5	-	< 0.5	-
1.2-Dichloroethane	0.5	mg/kg	< 0.5	-	< 0.5	-
1.2-Dichloropropane	0.5	mg/kg	< 0.5	-	< 0.5	-
1.2.3-Trichloropropane	0.5	mg/kg	< 0.5	-	< 0.5	-
1.2.4-Trimethylbenzene	0.5	mg/kg	< 0.5	-	< 0.5	-
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5	-	< 0.5	-
1.3-Dichloropropane	0.5	mg/kg	< 0.5	-	< 0.5	-
1.3.5-Trimethylbenzene	0.5	mg/kg	< 0.5	-	< 0.5	-
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5	-	< 0.5	-
2-Butanone (MEK)	0.5	mg/kg	< 0.5	-	< 0.5	-
2-Propanone (Acetone)	0.5	mg/kg	< 0.5	-	< 0.5	-
4-Chlorotoluene	0.5	mg/kg	< 0.5	-	< 0.5	-
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	< 0.5	-	< 0.5	-
Allyl chloride	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	-
Bromobenzene	0.5	mg/kg	< 0.5	-	< 0.5	-
Bromochloromethane	0.5	mg/kg	< 0.5	-	< 0.5	-
Bromodichloromethane	0.5	mg/kg	< 0.5	-	< 0.5	-
Bromoform	0.5	mg/kg	< 0.5	-	< 0.5	-
Bromomethane	0.5	mg/kg	< 0.5	-	< 0.5	-
Carbon disulfide	0.5	mg/kg	< 0.5	-	< 0.5	-
Carbon Tetrachloride	0.5	mg/kg	< 0.5	-	< 0.5	-
Chlorobenzene	0.5	mg/kg	< 0.5	-	< 0.5	-
Chloroethane	0.5	mg/kg	< 0.5	-	< 0.5	-
Chloroform	0.5	mg/kg	< 0.5	-	< 0.5	-
Chloromethane	0.5	mg/kg	< 0.5	-	< 0.5	-
cis-1.2-Dichloroethene	0.5	mg/kg	< 0.5	-	< 0.5	-
cis-1.3-Dichloropropene	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibromochloromethane	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibromomethane	0.5	mg/kg	< 0.5	-	< 0.5	-
Dichlorodifluoromethane	0.5	mg/kg	< 0.5	-	< 0.5	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	-
Iodomethane	0.5	mg/kg	< 0.5	-	< 0.5	-
Isopropyl benzene (Cumene)	0.5	mg/kg	< 0.5	-	< 0.5	-

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**TP11_1.2** **Soil** **S18-No14978** **Nov 10, 2018**	**TP12_0.2** **Soil** **S18-No14979** **Nov 10, 2018**	**QA100** **Soil** **S18-No14980** **Nov 10, 2018**	**BH4_0.4** **Soil** **S18-No14981** **Nov 10, 2018**
Volatile Organics						
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	-
Methylene Chloride	0.5	mg/kg	< 0.5	-	< 0.5	-
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	-
Styrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Tetrachloroethene	0.5	mg/kg	< 0.5	-	< 0.5	-
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	-
trans-1.2-Dichloroethene	0.5	mg/kg	< 0.5	-	< 0.5	-
trans-1.3-Dichloropropene	0.5	mg/kg	< 0.5	-	< 0.5	-
Trichloroethene	0.5	mg/kg	< 0.5	-	< 0.5	-
Trichlorofluoromethane	0.5	mg/kg	< 0.5	-	< 0.5	-
Vinyl chloride	0.5	mg/kg	< 0.5	-	< 0.5	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	< 0.3	-
Total MAH*	0.5	mg/kg	< 0.5	-	< 0.5	-
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	< 0.5	-	< 0.5	-
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	< 0.5	-	< 0.5	-
4-Bromofluorobenzene (surr.)	1	%	102	-	102	-
Toluene-d8 (surr.)	1	%	99	-	97	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	1200
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	940
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	2140
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.0
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	1.3
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.7
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.9
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.6
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.8
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.6
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	3.4
2-Fluorobiphenyl (surr.)	1	%	93	95	107	89
p-Terphenyl-d14 (surr.)	1	%	114	116	130	89

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**TP11_1.2** **Soil** **S18-No14978** **Nov 10, 2018**	**TP12_0.2** **Soil** **S18-No14979** **Nov 10, 2018**	**QA100** **Soil** **S18-No14980** **Nov 10, 2018**	**BH4_0.4** **Soil** **S18-No14981** **Nov 10, 2018**
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	< 0.05	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	< 0.05	-
a-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	-	< 0.05	< 0.05	-
b-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
d-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan I	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	-	< 0.05	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	< 0.05	-
Methoxychlor	0.05	mg/kg	-	< 0.05	< 0.05	-
Toxaphene	1	mg/kg	-	< 1	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	-
Dibutylchlorendate (surr.)	1	%	-	69	73	-
Tetrachloro-m-xylene (surr.)	1	%	-	67	80	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	< 0.2	< 0.2	-
Bolstar	0.2	mg/kg	-	< 0.2	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	-	< 0.2	< 0.2	-
Chlorpyrifos	0.2	mg/kg	-	< 0.2	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	-	< 0.2	< 0.2	-
Coumaphos	2	mg/kg	-	< 2	< 2	-
Demeton-S	0.2	mg/kg	-	< 0.2	< 0.2	-
Demeton-O	0.2	mg/kg	-	< 0.2	< 0.2	-
Diazinon	0.2	mg/kg	-	< 0.2	< 0.2	-
Dichlorvos	0.2	mg/kg	-	< 0.2	< 0.2	-
Dimethoate	0.2	mg/kg	-	< 0.2	< 0.2	-
Disulfoton	0.2	mg/kg	-	< 0.2	< 0.2	-
EPN	0.2	mg/kg	-	< 0.2	< 0.2	-
Ethion	0.2	mg/kg	-	< 0.2	< 0.2	-
Ethoprop	0.2	mg/kg	-	< 0.2	< 0.2	-
Ethyl parathion	0.2	mg/kg	-	< 0.2	< 0.2	-
Fenitrothion	0.2	mg/kg	-	< 0.2	< 0.2	-
Fensulfothion	0.2	mg/kg	-	< 0.2	< 0.2	-
Fenthion	0.2	mg/kg	-	< 0.2	< 0.2	-
Malathion	0.2	mg/kg	-	< 0.2	< 0.2	-
Merphos	0.2	mg/kg	-	< 0.2	< 0.2	-

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**TP11_1.2** **Soil** **S18-No14978** **Nov 10, 2018**	**TP12_0.2** **Soil** **S18-No14979** **Nov 10, 2018**	**QA100** **Soil** **S18-No14980** **Nov 10, 2018**	**BH4_0.4** **Soil** **S18-No14981** **Nov 10, 2018**
Organophosphorus Pesticides						
Methyl parathion	0.2	mg/kg	-	< 0.2	< 0.2	-
Mevinphos	0.2	mg/kg	-	< 0.2	< 0.2	-
Monocrotophos	2	mg/kg	-	< 2	< 2	-
Naled	0.2	mg/kg	-	< 0.2	< 0.2	-
Omethoate	2	mg/kg	-	< 2	< 2	-
Phorate	0.2	mg/kg	-	< 0.2	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	-	< 0.2	< 0.2	-
Pyrazophos	0.2	mg/kg	-	< 0.2	< 0.2	-
Ronnel	0.2	mg/kg	-	< 0.2	< 0.2	-
Terbufos	0.2	mg/kg	-	< 0.2	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	-	< 0.2	< 0.2	-
Tokuthion	0.2	mg/kg	-	< 0.2	< 0.2	-
Trichloronate	0.2	mg/kg	-	< 0.2	< 0.2	-
Triphenylphosphate (surr.)	1	%	-	96	108	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	< 0.1	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	< 0.1	-
Aroclor-1232	0.1	mg/kg	-	< 0.1	< 0.1	-
Aroclor-1242	0.1	mg/kg	-	< 0.1	< 0.1	-
Aroclor-1248	0.1	mg/kg	-	< 0.1	< 0.1	-
Aroclor-1254	0.1	mg/kg	-	< 0.1	< 0.1	-
Aroclor-1260	0.1	mg/kg	-	< 0.1	< 0.1	-
Total PCB*	0.1	mg/kg	-	< 0.1	< 0.1	-
Dibutylchlorendate (surr.)	1	%	-	69	73	-
Tetrachloro-m-xylene (surr.)	1	%	-	67	80	-
% Clay	1	%	-	< 1	-	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	31	-	-
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	5.9	-	-
Total Organic Carbon	0.1	%	-	0.7	-	-
% Moisture	1	%	2.4	3.7	6.9	< 1
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	< 5	< 5	< 5
Copper	5	mg/kg	< 5	< 5	11	11
Iron	20	mg/kg	-	630	-	-
Lead	5	mg/kg	19	13	14	13
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	13
Zinc	5	mg/kg	12	17	15	25
Heavy Metals						
Iron (%)	0.01	%	-	0.06	-	-
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	1.9	-	-

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**BH05_0.2-0.5** **Soil** **S18-No14982** **Nov 10, 2018**	**BH01_1.0-1.45** **Soil** **S18-No14983** **Nov 10, 2018**	**BH01_2.5-2.95** **Soil** **S18-No14984** **Nov 10, 2018**	**BH01_3.0-3.45** **Soil** **S18-No14985** **Nov 10, 2018**
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	-	-
TRH C10-C14	20	mg/kg	< 20	-	-	-
TRH C15-C28	50	mg/kg	< 50	-	-	-
TRH C29-C36	50	mg/kg	< 50	-	-	-
TRH C10-36 (Total)	50	mg/kg	< 50	-	-	-
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
1.1.1-Trichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.2-Trichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dibromoethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.2.3-Trichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.2.4-Trimethylbenzene	0.5	mg/kg	< 0.5	-	-	-
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
1.3-Dichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.3.5-Trimethylbenzene	0.5	mg/kg	< 0.5	-	-	-
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
2-Butanone (MEK)	0.5	mg/kg	< 0.5	-	-	-
2-Propanone (Acetone)	0.5	mg/kg	< 0.5	-	-	-
4-Chlorotoluene	0.5	mg/kg	< 0.5	-	-	-
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	< 0.5	-	-	-
Allyl chloride	0.5	mg/kg	< 0.5	-	-	-
Benzene	0.1	mg/kg	< 0.1	-	-	-
Bromobenzene	0.5	mg/kg	< 0.5	-	-	-
Bromochloromethane	0.5	mg/kg	< 0.5	-	-	-
Bromodichloromethane	0.5	mg/kg	< 0.5	-	-	-
Bromoform	0.5	mg/kg	< 0.5	-	-	-
Bromomethane	0.5	mg/kg	< 0.5	-	-	-
Carbon disulfide	0.5	mg/kg	< 0.5	-	-	-
Carbon Tetrachloride	0.5	mg/kg	< 0.5	-	-	-
Chlorobenzene	0.5	mg/kg	< 0.5	-	-	-
Chloroethane	0.5	mg/kg	< 0.5	-	-	-
Chloroform	0.5	mg/kg	< 0.5	-	-	-
Chloromethane	0.5	mg/kg	< 0.5	-	-	-
cis-1.2-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
cis-1.3-Dichloropropene	0.5	mg/kg	< 0.5	-	-	-
Dibromochloromethane	0.5	mg/kg	< 0.5	-	-	-
Dibromomethane	0.5	mg/kg	< 0.5	-	-	-
Dichlorodifluoromethane	0.5	mg/kg	< 0.5	-	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	-	-
Iodomethane	0.5	mg/kg	< 0.5	-	-	-
Isopropyl benzene (Cumene)	0.5	mg/kg	< 0.5	-	-	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	-	-
Methylene Chloride	0.5	mg/kg	< 0.5	-	-	-

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**BH05_0.2-0.5** **Soil** **S18-No14982** **Nov 10, 2018**	**BH01_1.0-1.45** **Soil** **S18-No14983** **Nov 10, 2018**	**BH01_2.5-2.95** **Soil** **S18-No14984** **Nov 10, 2018**	**BH01_3.0-3.45** **Soil** **S18-No14985** **Nov 10, 2018**
Volatile Organics						
o-Xylene	0.1	mg/kg	< 0.1	-	-	-
Styrene	0.5	mg/kg	< 0.5	-	-	-
Tetrachloroethene	0.5	mg/kg	< 0.5	-	-	-
Toluene	0.1	mg/kg	< 0.1	-	-	-
trans-1.2-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
trans-1.3-Dichloropropene	0.5	mg/kg	< 0.5	-	-	-
Trichloroethene	0.5	mg/kg	< 0.5	-	-	-
Trichlorofluoromethane	0.5	mg/kg	< 0.5	-	-	-
Vinyl chloride	0.5	mg/kg	< 0.5	-	-	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	-	-
Total MAH*	0.5	mg/kg	< 0.5	-	-	-
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	< 0.5	-	-	-
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	< 0.5	-	-	-
4-Bromofluorobenzene (surr.)	1	%	102	-	-	-
Toluene-d8 (surr.)	1	%	99	-	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	< 0.5	-	-	-
TRH C6-C10	20	mg/kg	< 20	-	-	-
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20	-	-	-
TRH >C10-C16	50	mg/kg	< 50	-	-	-
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	-	-	-
TRH >C16-C34	100	mg/kg	< 100	-	-	-
TRH >C34-C40	100	mg/kg	< 100	-	-	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	-	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	-	-
Acenaphthene	0.5	mg/kg	< 0.5	-	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	-	-
Anthracene	0.5	mg/kg	< 0.5	-	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	-	-
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	-	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	-	-
Chrysene	0.5	mg/kg	< 0.5	-	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	-	-
Fluoranthene	0.5	mg/kg	< 0.5	-	-	-
Fluorene	0.5	mg/kg	< 0.5	-	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	-	-
Naphthalene	0.5	mg/kg	< 0.5	-	-	-
Phenanthrene	0.5	mg/kg	< 0.5	-	-	-
Pyrene	0.5	mg/kg	< 0.5	-	-	-
Total PAH*	0.5	mg/kg	< 0.5	-	-	-
2-Fluorobiphenyl (surr.)	1	%	99	-	-	-
p-Terphenyl-d14 (surr.)	1	%	121	-	-	-
% Moisture	1	%	2.5	-	-	-

Client Sample ID			**BH05_0.2-0.5**	**BH01_1.0-1.45**	**BH01_2.5-2.95**	**BH01_3.0-3.45**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14982**	**S18-No14983**	**S18-No14984**	**S18-No14985**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	< 2	-	-	-
Cadmium	0.4	mg/kg	< 0.4	-	-	-
Chromium	5	mg/kg	< 5	-	-	-
Copper	5	mg/kg	< 5	-	-	-
Lead	5	mg/kg	< 5	-	-	-
Mercury	0.1	mg/kg	< 0.1	-	-	-
Nickel	5	mg/kg	< 5	-	-	-
Zinc	5	mg/kg	< 5	-	-	-
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	-	6.4	6.3	7.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	-	4.2	4.8	5.7
Reaction Ratings*S05		comment	-	1.0	1.0	1.0

Client Sample ID			**BH01_4.0-4.45**	**BH01_5.0-5.95**	**BH01_7.0-7.45**	**BH01_8.0-8.95**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14986**	**S18-No14987**	**S18-No14988**	**S18-No14989**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.7	9.2	9.0	8.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.0	7.7	5.1	4.2
Reaction Ratings*S05		comment	1.0	1.0	2.0	3.0

Client Sample ID			**BH01_10.0-10.45**	**BH01_11.0-11.45**	**BH01_13.0-13.45**	**BH01_14.5-14.95**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14990**	**S18-No14991**	**S18-No14992**	**S18-No14993**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.2	8.5	8.3	8.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.3	7.1	5.2	5.8
Reaction Ratings*S05		comment	3.0	1.0	4.0	1.0

Client Sample ID			**BH01_16.0-16.45**	**BH04_0.5-0.95**	**BH04_2.0-2.45**	**BH04_3.0-3.45**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14994**	**S18-No14995**	**S18-No14996**	**S18-No14997**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.9	6.2	4.9	5.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.1	3.9	3.3	3.4
Reaction Ratings*S05		comment	2.0	1.0	1.0	1.0

Client Sample ID			**BH05_1.5-1.95**	**BH05_4.5-4.95**
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No14998**	**S18-No14999**
Date Sampled			**Nov 10, 2018**	**Nov 10, 2018**
Test/Reference	LOR	Unit		
Acid Sulfate Soils Field pH Test				
pH-F (Field pH test)*	0.1	pH Units	5.6	6.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.5	5.0
Reaction Ratings*S05		comment	1.0	1.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B8			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Volatile Organics	Melbourne	Nov 15, 2018	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Melbourne	Nov 15, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins | mgt Suite B7			
BTEX	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Eurofins | mgt Suite B15			
Organochlorine Pesticides	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Polychlorinated Biphenyls	Melbourne	Nov 15, 2018	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
NEPM Screen for Soil Classification			
% Clay	Brisbane	Nov 15, 2018	6 Day
- Method: LTM-GEN-7040			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Melbourne	Nov 15, 2018	7 Day
- Method: LTM-INO-4030 Conductivity			
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Melbourne	Nov 15, 2018	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
Total Organic Carbon	Melbourne	Nov 17, 2018	28 Day
- Method: APHA 5310B Total Organic Carbon			
Heavy Metals	Melbourne	Nov 15, 2018	180 Day
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Cation Exchange Capacity	Melbourne	Nov 16, 2018	180 Days
- Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage			
% Moisture	Melbourne	Nov 12, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			
Acid Sulfate Soils Field pH Test	Brisbane	Nov 12, 2018	7 Days
- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests			

Company Name: Cardno (NSW/ACT) Pty Ltd
Address: Level 9, 203 Pacific Highway
St Leonards
NSW 2065

Project Name: KYEEMAGH INFANTS SCHOOL
Project ID: 80818157

Order No.:
Report #: 627289
Phone: 0294967700
Fax: 02 9499 3902

Received: Nov 12, 2018 4:31 PM
Due: Nov 19, 2018
Priority: 5 Day
Contact Name: Ben Withnall

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Acid Sulfate Soils Field pH Test	Eurofins | mgt Suite B15	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X		X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X							
Brisbane Laboratory - NATA Site # 20794									X			X		
Perth Laboratory - NATA Site # 23736														
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	TP03_0.2	Nov 10, 2018		Soil	S18-No14957	X				X	X		X	
2	TP03_1.2	Nov 10, 2018		Soil	S18-No14958	X					X			X
3	TP03_ASB1	Nov 10, 2018		Building Materials	S18-No14959		X							
4	TP19_0.1	Nov 10, 2018		Soil	S18-No14960	X					X		X	
5	TP19_0.3	Nov 10, 2018		Soil	S18-No14961	X					X		X	
6	TP01_0.2	Nov 10, 2018		Soil	S18-No14962	X					X		X	
7	TP01_0.9	Nov 10, 2018		Soil	S18-No14963						X		X	
8	TP02_0.1	Nov 10, 2018		Soil	S18-No14964	X				X	X		X	
9	TP02_0.4	Nov 10, 2018		Soil	S18-No14965	X					X		X	

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Melbourne Laboratory - NATA Site # 1254 & 14271								X		X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X							
Brisbane Laboratory - NATA Site # 20794									X			X		
Perth Laboratory - NATA Site # 23736														
10	TP04_0.1	Nov 10, 2018		Soil	S18-No14966	X				X	X		X	
11	TP05_0.1	Nov 10, 2018		Soil	S18-No14967	X					X		X	
12	TP05_0.9	Nov 10, 2018		Soil	S18-No14968						X	X		X
13	TP06_0.1	Nov 10, 2018		Soil	S18-No14969	X					X		X	
14	TP06_0.3	Nov 10, 2018		Soil	S18-No14970						X			X
15	TP07_0.1	Nov 10, 2018		Soil	S18-No14971	X					X		X	
16	TP07_0.4	Nov 10, 2018		Soil	S18-No14972						X	X	X	
17	TP07_0.6	Nov 10, 2018		Soil	S18-No14973						X		X	
18	TP08_0.4	Nov 10, 2018		Soil	S18-No14974						X			X
19	TP09_0.3	Nov 10, 2018		Soil	S18-No14975	X					X		X	
20	TP10_0.1	Nov 10, 2018		Soil	S18-No14976						X		X	
21	TP11_0.2	Nov 10, 2018		Soil	S18-No14977	X				X	X		X	

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Melbourne Laboratory - NATA Site # 1254 & 14271								X		X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X							
Brisbane Laboratory - NATA Site # 20794									X			X		
Perth Laboratory - NATA Site # 23736														
22	TP11_1.2	Nov 10, 2018		Soil	S18-No14978						X			X
23	TP12_0.2	Nov 10, 2018		Soil	S18-No14979	X				X	X	X	X	
24	QA100	Nov 10, 2018		Soil	S18-No14980					X	X			X
25	BH4_0.4	Nov 10, 2018		Soil	S18-No14981						X		X	
26	BH05_0.2-0.5	Nov 10, 2018		Soil	S18-No14982						X			X
27	BH01_1.0-1.45	Nov 10, 2018		Soil	S18-No14983				X					
28	BH01_2.5-2.95	Nov 10, 2018		Soil	S18-No14984				X					
29	BH01_3.0-3.45	Nov 10, 2018		Soil	S18-No14985				X					
30	BH01_4.0-4.45	Nov 10, 2018		Soil	S18-No14986				X					
31	BH01_5.0-5.95	Nov 10, 2018		Soil	S18-No14987				X					
32	BH01_7.0-7.45	Nov 10, 2018		Soil	S18-No14988				X					
33	BH01_8.0-8.95	Nov 10, 2018		Soil	S18-No14989				X					

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Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Acid Sulfate Soils Field pH Test	Eurofins | mgt Suite B15	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X		X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X							
Brisbane Laboratory - NATA Site # 20794									X			X		
Perth Laboratory - NATA Site # 23736														
34	BH01_10.0-10.45	Nov 10, 2018		Soil	S18-No14990				X					
35	BH01_11.0-11.45	Nov 10, 2018		Soil	S18-No14991				X					
36	BH01_13.0-13.45	Nov 10, 2018		Soil	S18-No14992				X					
37	BH01_14.5-14.95	Nov 10, 2018		Soil	S18-No14993				X					
38	BH01_16.0-16.45	Nov 10, 2018		Soil	S18-No14994				X					
39	BH04_0.5-0.95	Nov 10, 2018		Soil	S18-No14995				X					
40	BH04_2.0-2.45	Nov 10, 2018		Soil	S18-No14996				X					
41	BH04_3.0-3.45	Nov 10, 2018		Soil	S18-No14997				X					
42	BH05_1.5-1.95	Nov 10, 2018		Soil	S18-No14998				X					

Company Name:	Cardno (NSW/ACT) Pty Ltd	**Order No.:**		**Received:**	Nov 12, 2018 4:31 PM
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		Phone:	0294967700	**Priority:**	5 Day
		Fax:	02 9499 3902	**Contact Name:**	Ben Withnall

Project Name: KYEEMAGH INFANTS SCHOOL
Project ID: 80818157

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Acid Sulfate Soils Field pH Test	Eurofins | mgt Suite B15	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X		X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X							
Brisbane Laboratory - NATA Site # 20794									X			X		
Perth Laboratory - NATA Site # 23736														
43	BH05_4.5-4.95	Nov 10, 2018		Soil	S18-No14999				X					
44	TP04_0.4	Nov 10, 2018		Soil	S18-No15000			X						
45	TP08_0.1	Nov 10, 2018		Soil	S18-No15001			X						
46	TP09_0.8	Nov 10, 2018		Soil	S18-No15002			X						
47	TP10_0.4	Nov 10, 2018		Soil	S18-No15003			X						
48	TP12_1.0	Nov 10, 2018		Soil	S18-No15004			X						
49	BH04_0.5-0.95	Nov 10, 2018		Soil	S18-No15005			X						
Test Counts						14	1	6	17	6	25	3	18	7

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ug/L:** micrograms per litre
ppm: Parts per million	**ppb:** Parts per billion	**%:** Percentage
org/100mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dibromoethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.4-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.3.5-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
2-Butanone (MEK)	mg/kg	< 0.5			0.5	Pass	
2-Propanone (Acetone)	mg/kg	< 0.5			0.5	Pass	
4-Chlorotoluene	mg/kg	< 0.5			0.5	Pass	
4-Methyl-2-pentanone (MIBK)	mg/kg	< 0.5			0.5	Pass	
Allyl chloride	mg/kg	< 0.5			0.5	Pass	
Benzene	mg/kg	< 0.1			0.1	Pass	
Bromobenzene	mg/kg	< 0.5			0.5	Pass	
Bromochloromethane	mg/kg	< 0.5			0.5	Pass	
Bromodichloromethane	mg/kg	< 0.5			0.5	Pass	
Bromoform	mg/kg	< 0.5			0.5	Pass	
Bromomethane	mg/kg	< 0.5			0.5	Pass	
Carbon disulfide	mg/kg	< 0.5			0.5	Pass	
Carbon Tetrachloride	mg/kg	< 0.5			0.5	Pass	
Chlorobenzene	mg/kg	< 0.5			0.5	Pass	
Chloroethane	mg/kg	< 0.5			0.5	Pass	
Chloroform	mg/kg	< 0.5			0.5	Pass	
Chloromethane	mg/kg	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
cis-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Dibromochloromethane	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dibromomethane	mg/kg	< 0.5			0.5	Pass	
Dichlorodifluoromethane	mg/kg	< 0.5			0.5	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
Iodomethane	mg/kg	< 0.5			0.5	Pass	
Isopropyl benzene (Cumene)	mg/kg	< 0.5			0.5	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
Methylene Chloride	mg/kg	< 0.5			0.5	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Styrene	mg/kg	< 0.5			0.5	Pass	
Tetrachloroethene	mg/kg	< 0.5			0.5	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
trans-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
trans-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Trichloroethene	mg/kg	< 0.5			0.5	Pass	
Trichlorofluoromethane	mg/kg	< 0.5			0.5	Pass	
Vinyl chloride	mg/kg	< 0.5			0.5	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							
% Clay	%	< 1			1	Pass	
Total Organic Carbon	%	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Iron	mg/kg	< 20			20	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Cation Exchange Capacity							
Cation Exchange Capacity	meq/100g	< 0.05			0.05	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	102			70-130	Pass	
TRH C10-C14	%	106			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	93			70-130	Pass	
Toluene	%	105			70-130	Pass	
Ethylbenzene	%	116			70-130	Pass	
m&p-Xylenes	%	119			70-130	Pass	
Xylenes - Total	%	120			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	117			70-130	Pass	
1.1.1-Trichloroethane	%	113			70-130	Pass	
1.2-Dichlorobenzene	%	104			70-130	Pass	
1.2-Dichloroethane	%	118			70-130	Pass	
Trichloroethene	%	116			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	88			70-130	Pass	
TRH C6-C10	%	98			70-130	Pass	
TRH >C10-C16	%	114			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	100			70-130	Pass	
Acenaphthylene	%	112			70-130	Pass	
Anthracene	%	123			70-130	Pass	
Benz(a)anthracene	%	105			70-130	Pass	
Benzo(a)pyrene	%	75			70-130	Pass	
Benzo(b&j)fluoranthene	%	91			70-130	Pass	
Benzo(g.h.i)perylene	%	88			70-130	Pass	
Benzo(k)fluoranthene	%	84			70-130	Pass	
Chrysene	%	90			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dibenz(a.h)anthracene	%	105			70-130	Pass	
Fluoranthene	%	121			70-130	Pass	
Fluorene	%	96			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	91			70-130	Pass	
Naphthalene	%	82			70-130	Pass	
Phenanthrene	%	92			70-130	Pass	
Pyrene	%	110			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	77			70-130	Pass	
4.4'-DDE	%	90			70-130	Pass	
4.4'-DDT	%	89			70-130	Pass	
a-BHC	%	127			70-130	Pass	
Aldrin	%	92			70-130	Pass	
b-BHC	%	90			70-130	Pass	
d-BHC	%	74			70-130	Pass	
Dieldrin	%	92			70-130	Pass	
Endosulfan I	%	106			70-130	Pass	
Endosulfan II	%	71			70-130	Pass	
Endosulfan sulphate	%	105			70-130	Pass	
Endrin	%	103			70-130	Pass	
Endrin aldehyde	%	103			70-130	Pass	
Endrin ketone	%	113			70-130	Pass	
g-BHC (Lindane)	%	103			70-130	Pass	
Heptachlor	%	73			70-130	Pass	
Heptachlor epoxide	%	88			70-130	Pass	
Hexachlorobenzene	%	86			70-130	Pass	
Methoxychlor	%	106			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	90			70-130	Pass	
Dimethoate	%	112			70-130	Pass	
Ethion	%	123			70-130	Pass	
Fenitrothion	%	95			70-130	Pass	
Methyl parathion	%	89			70-130	Pass	
Mevinphos	%	70			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	98			70-130	Pass	
LCS - % Recovery							
% Clay	%	82			70-130	Pass	
Total Organic Carbon	%	86			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	108			80-120	Pass	
Cadmium	%	105			80-120	Pass	
Chromium	%	110			80-120	Pass	
Copper	%	109			80-120	Pass	
Lead	%	112			80-120	Pass	
Mercury	%	94			75-125	Pass	
Nickel	%	107			80-120	Pass	
Zinc	%	108			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M18-No12287	NCP	%	112			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-No12287	NCP	%	95			70-130	Pass	
Toluene	M18-No12287	NCP	%	104			70-130	Pass	
Ethylbenzene	M18-No12287	NCP	%	111			70-130	Pass	
m&p-Xylenes	M18-No12287	NCP	%	115			70-130	Pass	
o-Xylene	M18-No12287	NCP	%	116			70-130	Pass	
Xylenes - Total	M18-No12287	NCP	%	115			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-No12287	NCP	%	92			70-130	Pass	
TRH C6-C10	M18-No12287	NCP	%	106			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S18-No14508	NCP	%	124			70-130	Pass	
Acenaphthylene	S18-No14508	NCP	%	85			70-130	Pass	
Anthracene	S18-No14508	NCP	%	96			70-130	Pass	
Benz(a)anthracene	S18-No14508	NCP	%	122			70-130	Pass	
Benzo(a)pyrene	S18-No14508	NCP	%	87			70-130	Pass	
Benzo(b&j)fluoranthene	S18-No14508	NCP	%	109			70-130	Pass	
Benzo(g.h.i)perylene	S18-No14508	NCP	%	82			70-130	Pass	
Benzo(k)fluoranthene	S18-No14508	NCP	%	99			70-130	Pass	
Chrysene	S18-No14508	NCP	%	105			70-130	Pass	
Dibenz(a.h)anthracene	S18-No14508	NCP	%	97			70-130	Pass	
Fluoranthene	S18-No14508	NCP	%	91			70-130	Pass	
Fluorene	S18-No14508	NCP	%	112			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S18-No14508	NCP	%	85			70-130	Pass	
Naphthalene	S18-No14508	NCP	%	92			70-130	Pass	
Phenanthrene	S18-No14508	NCP	%	106			70-130	Pass	
Pyrene	S18-No14508	NCP	%	124			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	S18-No16633	NCP	%	85			70-130	Pass	
4.4'-DDE	S18-No16633	NCP	%	92			70-130	Pass	
4.4'-DDT	M18-No14233	NCP	%	121			70-130	Pass	
a-BHC	S18-No16633	NCP	%	124			70-130	Pass	
Aldrin	S18-No16633	NCP	%	101			70-130	Pass	
b-BHC	S18-No16633	NCP	%	100			70-130	Pass	
d-BHC	S18-No16633	NCP	%	103			70-130	Pass	
Dieldrin	S18-No16633	NCP	%	84			70-130	Pass	
Endosulfan I	S18-No16633	NCP	%	103			70-130	Pass	
Endosulfan II	S18-No16633	NCP	%	74			70-130	Pass	
Endosulfan sulphate	S18-No16633	NCP	%	81			70-130	Pass	
Endrin	S18-No16633	NCP	%	88			70-130	Pass	
Endrin aldehyde	S18-No16633	NCP	%	74			70-130	Pass	
Endrin ketone	S18-No16633	NCP	%	76			70-130	Pass	
g-BHC (Lindane)	S18-No16633	NCP	%	121			70-130	Pass	
Heptachlor	S18-No16633	NCP	%	88			70-130	Pass	
Heptachlor epoxide	S18-No16633	NCP	%	90			70-130	Pass	
Hexachlorobenzene	S18-No16633	NCP	%	124			70-130	Pass	
Methoxychlor	M18-No14233	NCP	%	123			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S18-No14513	NCP	%	108			70-130	Pass	
Dimethoate	S18-No14513	NCP	%	95			70-130	Pass	
Ethion	S18-No14513	NCP	%	88			70-130	Pass	
Fenitrothion	S18-No14513	NCP	%	92			70-130	Pass	
Methyl parathion	S18-No14513	NCP	%	82			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S18-No14523	NCP	%	96			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
1.1-Dichloroethene	S18-No13762	NCP	%	73			70-130	Pass	
1.1.1-Trichloroethane	S18-No13762	NCP	%	86			70-130	Pass	
1.2-Dichlorobenzene	S18-No13762	NCP	%	94			70-130	Pass	
1.2-Dichloroethane	S18-No13762	NCP	%	108			70-130	Pass	
Trichloroethene	S18-No13762	NCP	%	92			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S18-No14970	CP	%	82			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S18-No14970	CP	%	99			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S18-No14970	CP	%	97			75-125	Pass	
Cadmium	S18-No14970	CP	%	96			75-125	Pass	
Chromium	S18-No14970	CP	%	96			75-125	Pass	
Copper	S18-No14970	CP	%	93			75-125	Pass	
Lead	S18-No14970	CP	%	96			75-125	Pass	
Mercury	S18-No14970	CP	%	89			70-130	Pass	
Nickel	S18-No14970	CP	%	91			75-125	Pass	
Zinc	S18-No14970	CP	%	86			75-125	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Mevinphos	S18-No13245	NCP	%	84			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M18-No15527	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M18-No15527	NCP	mg/kg	160	89	56	30%	Fail	Q15
TRH C29-C36	M18-No15527	NCP	mg/kg	170	69	84	30%	Fail	Q15
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M18-No15527	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M18-No15527	NCP	mg/kg	290	140	68	30%	Fail	Q15
TRH >C34-C40	M18-No15527	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-No14520	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S18-No14520	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S18-No14520	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S18-No14520	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S18-No14520	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Benzo(b&j)fluoranthene	S18-No14520	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S18-No14520	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S18-No14520	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S18-No14520	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S18-No14520	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S18-No14520	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S18-No14520	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S18-No14520	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S18-No14520	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S18-No14520	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S18-No14520	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S18-No14522	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S18-No14522	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S18-No14522	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S18-No14522	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S18-No14522	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S18-No14522	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S18-No14522	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S18-No14522	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S18-No14522	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S18-No14522	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S18-No14522	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S18-No14522	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S18-No14522	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S18-No14522	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S18-No14522	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S18-No14522	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S18-No14522	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S18-No14522	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S18-No14522	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S18-No14522	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	S18-No14522	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S18-No14522	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	S18-No14522	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S18-No14522	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	S18-No14522	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	S18-No14522	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	S18-No14522	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	S18-No14522	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	S18-No14522	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S18-No14920	NCP	%	15	15	4.0	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1-Dichloroethene	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1-Trichloroethane	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2-Trichloroethane	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1.2.2-Tetrachloroethane	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dibromoethane	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichlorobenzene	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloroethane	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloropropane	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.3-Trichloropropane	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4-Trimethylbenzene	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichlorobenzene	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichloropropane	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3.5-Trimethylbenzene	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.4-Dichlorobenzene	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Butanone (MEK)	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Propanone (Acetone)	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chlorotoluene	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Allyl chloride	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromobenzene	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromochloromethane	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromodichloromethane	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromoform	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromomethane	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon disulfide	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon Tetrachloride	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chlorobenzene	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroethane	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroform	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloromethane	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.2-Dichloroethene	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.3-Dichloropropene	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromochloromethane	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromomethane	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorodifluoromethane	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Iodomethane	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Isopropyl benzene (Cumene)	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Methylene Chloride	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Styrene	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Tetrachloroethene	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.2-Dichloroethene	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.3-Dichloropropene	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichloroethene	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichlorofluoromethane	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Vinyl chloride	S18-No13761	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Clay	M18-Oc24970	NCP	%	8.8	8.8	<1	30%	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	S18-No16804	NCP	uS/cm	80	110	28	30%	Pass	
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	S18-No16804	NCP	pH Units	7.1	7.2	pass	30%	Pass	
Total Organic Carbon	S18-No14968	CP	%	0.1	< 0.1	9.3	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Iron (%)	M18-No15610	NCP	%	5.5	5.4	2.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S18-No14969	CP	mg/kg	< 20	< 20	<1	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-No14969	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S18-No14969	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S18-No14969	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S18-No14969	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S18-No14969	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S18-No14969	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-No14969	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S18-No14969	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S18-No14970	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	S18-No14970	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S18-No14970	CP	mg/kg	13	13	1.0	30%	Pass	
Copper	S18-No14970	CP	mg/kg	16	16	1.0	30%	Pass	
Iron	S18-No14970	CP	mg/kg	6700	6700	1.0	30%	Pass	
Lead	S18-No14970	CP	mg/kg	11	11	1.0	30%	Pass	
Mercury	S18-No14970	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S18-No14970	CP	mg/kg	17	17	1.0	30%	Pass	
Zinc	S18-No14970	CP	mg/kg	26	26	1.0	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	S18-No14983	CP	pH Units	6.4	6.3	pass	30%	Pass	
Reaction Ratings*	S18-No14983	CP	comment	1.0	1.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	S18-No14993	CP	pH Units	8.2	8.3	pass	30%	Pass	
Reaction Ratings*	S18-No14993	CP	comment	1.0	1.0	pass	30%	Pass	

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Nibha Vaidya	Analytical Services Manager
Chris Bennett	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Jonathon Angell	Senior Analyst-Inorganic (QLD)
Joseph Edouard	Senior Analyst-Organic (VIC)
Julie Kay	Senior Analyst-Inorganic (VIC)
Myles Clark	Senior Analyst-SPOCAS (QLD)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Cardno (NSW/ACT) Pty Ltd
Level 9, 203 Pacific Highway
St Leonards
NSW 2065

Attention:	Ben Withnall
Report	627289-AID
Project Name	KYEEMAGH INFANTS SCHOOL
Project ID	80818157
Received Date	Nov 12, 2018
Date Reported	Nov 21, 2018

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name KYEEMAGH INFANTS SCHOOL
Project ID 80818157
Date Sampled Nov 10, 2018
Report 627289-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
TP03_0.2	18-No14957	Nov 10, 2018	Approximate Sample 678g Sample consisted of: Brown fine-grained sandy soil	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP03_1.2	18-No14958	Nov 10, 2018	Approximate Sample 709g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP03_ASB1	18-No14959	Nov 10, 2018	Approximate Sample 116g / 100x70x5mm Sample consisted of: Grey compressed fibre cement material	Chrysotile asbestos detected.
TP19_0.1	18-No14960	Nov 10, 2018	Approximate Sample 575g Sample consisted of: Brown fine-grained sandy soil and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP19_0.3	18-No14961	Nov 10, 2018	Approximate Sample 355g Sample consisted of: Brown fine-grained sandy soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP01_0.2	18-No14962	Nov 10, 2018	Approximate Sample 363g Sample consisted of: Dark brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP02_0.1	18-No14964	Nov 10, 2018	Approximate Sample 693g Sample consisted of: Brown fine-grained sandy soil, rocks and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP02_0.4	18-No14965	Nov 10, 2018	Approximate Sample 753g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
TP04_0.1	18-No14966	Nov 10, 2018	Approximate Sample 729g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP05_0.1	18-No14967	Nov 10, 2018	Approximate Sample 674g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP06_0.1	18-No14969	Nov 10, 2018	Approximate Sample 893g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP07_0.1	18-No14971	Nov 10, 2018	Approximate Sample 556g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP09_0.3	18-No14975	Nov 10, 2018	Approximate Sample 717g Sample consisted of: Brown fine-grained sandy soil and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP11_0.2	18-No14977	Nov 10, 2018	Approximate Sample 798g Sample consisted of: Brown fine-grained sandy soil and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP12_0.2	18-No14979	Nov 10, 2018	Approximate Sample 629g Sample consisted of: Brown fine-grained sandy soil and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Nov 12, 2018	Indefinite
Asbestos - LTM-ASB-8020	Sydney	Nov 12, 2018	Indefinite

Company Name: Cardno (NSW/ACT) Pty Ltd
Address: Level 9, 203 Pacific Highway
St Leonards
NSW 2065

Project Name: KYEEMAGH INFANTS SCHOOL
Project ID: 80818157

Order No.:
Report #: 627289
Phone: 0294967700
Fax: 02 9499 3902

Received: Nov 12, 2018 4:31 PM
Due: Nov 19, 2018
Priority: 5 Day
Contact Name: Ben Withnall

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Acid Sulfate Soils Field pH Test	Eurofins | mgt Suite B15	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X		X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X							
Brisbane Laboratory - NATA Site # 20794									X			X		
Perth Laboratory - NATA Site # 23736														
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	TP03_0.2	Nov 10, 2018		Soil	S18-No14957	X				X	X		X	
2	TP03_1.2	Nov 10, 2018		Soil	S18-No14958	X					X			X
3	TP03_ASB1	Nov 10, 2018		Building Materials	S18-No14959		X							
4	TP19_0.1	Nov 10, 2018		Soil	S18-No14960	X					X		X	
5	TP19_0.3	Nov 10, 2018		Soil	S18-No14961	X					X		X	
6	TP01_0.2	Nov 10, 2018		Soil	S18-No14962	X					X		X	
7	TP01_0.9	Nov 10, 2018		Soil	S18-No14963						X		X	
8	TP02_0.1	Nov 10, 2018		Soil	S18-No14964	X				X	X		X	
9	TP02_0.4	Nov 10, 2018		Soil	S18-No14965	X					X		X	

Company Name: Cardno (NSW/ACT) Pty Ltd
Address: Level 9, 203 Pacific Highway
St Leonards
NSW 2065

Project Name: KYEEMAGH INFANTS SCHOOL
Project ID: 80818157

Order No.:
Report #: 627289
Phone: 0294967700
Fax: 02 9499 3902

Received: Nov 12, 2018 4:31 PM
Due: Nov 19, 2018
Priority: 5 Day
Contact Name: Ben Withnall

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Acid Sulfate Soils Field pH Test	Eurofins | mgt Suite B15	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X		X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X							
Brisbane Laboratory - NATA Site # 20794									X			X		
Perth Laboratory - NATA Site # 23736														
10	TP04_0.1	Nov 10, 2018		Soil	S18-No14966	X				X	X		X	
11	TP05_0.1	Nov 10, 2018		Soil	S18-No14967	X					X		X	
12	TP05_0.9	Nov 10, 2018		Soil	S18-No14968						X	X		X
13	TP06_0.1	Nov 10, 2018		Soil	S18-No14969	X					X		X	
14	TP06_0.3	Nov 10, 2018		Soil	S18-No14970						X			X
15	TP07_0.1	Nov 10, 2018		Soil	S18-No14971	X					X		X	
16	TP07_0.4	Nov 10, 2018		Soil	S18-No14972						X	X	X	
17	TP07_0.6	Nov 10, 2018		Soil	S18-No14973						X		X	
18	TP08_0.4	Nov 10, 2018		Soil	S18-No14974						X			X
19	TP09_0.3	Nov 10, 2018		Soil	S18-No14975	X					X		X	
20	TP10_0.1	Nov 10, 2018		Soil	S18-No14976						X		X	
21	TP11_0.2	Nov 10, 2018		Soil	S18-No14977	X				X	X		X	

Company Name: Cardno (NSW/ACT) Pty Ltd
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St Leonards
NSW 2065

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Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Acid Sulfate Soils Field pH Test	Eurofins | mgt Suite B15	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X		X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X							
Brisbane Laboratory - NATA Site # 20794									X			X		
Perth Laboratory - NATA Site # 23736														
22	TP11_1.2	Nov 10, 2018		Soil	S18-No14978						X			X
23	TP12_0.2	Nov 10, 2018		Soil	S18-No14979	X				X	X	X	X	
24	QA100	Nov 10, 2018		Soil	S18-No14980					X	X			X
25	BH4_0.4	Nov 10, 2018		Soil	S18-No14981						X		X	
26	BH05_0.2-0.5	Nov 10, 2018		Soil	S18-No14982						X			X
27	BH01_1.0-1.45	Nov 10, 2018		Soil	S18-No14983				X					
28	BH01_2.5-2.95	Nov 10, 2018		Soil	S18-No14984				X					
29	BH01_3.0-3.45	Nov 10, 2018		Soil	S18-No14985				X					
30	BH01_4.0-4.45	Nov 10, 2018		Soil	S18-No14986				X					
31	BH01_5.0-5.95	Nov 10, 2018		Soil	S18-No14987				X					
32	BH01_7.0-7.45	Nov 10, 2018		Soil	S18-No14988				X					
33	BH01_8.0-8.95	Nov 10, 2018		Soil	S18-No14989				X					

Company Name: Cardno (NSW/ACT) Pty Ltd
Address: Level 9, 203 Pacific Highway
St Leonards
NSW 2065

Project Name: KYEEMAGH INFANTS SCHOOL
Project ID: 80818157

Order No.:
Report #: 627289
Phone: 0294967700
Fax: 02 9499 3902

Received: Nov 12, 2018 4:31 PM
Due: Nov 19, 2018
Priority: 5 Day
Contact Name: Ben Withnall

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Acid Sulfate Soils Field pH Test	Eurofins | mgt Suite B15	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X		X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X							
Brisbane Laboratory - NATA Site # 20794									X			X		
Perth Laboratory - NATA Site # 23736														
34	BH01_10.0-10.45	Nov 10, 2018		Soil	S18-No14990				X					
35	BH01_11.0-11.45	Nov 10, 2018		Soil	S18-No14991				X					
36	BH01_13.0-13.45	Nov 10, 2018		Soil	S18-No14992				X					
37	BH01_14.5-14.95	Nov 10, 2018		Soil	S18-No14993				X					
38	BH01_16.0-16.45	Nov 10, 2018		Soil	S18-No14994				X					
39	BH04_0.5-0.95	Nov 10, 2018		Soil	S18-No14995				X					
40	BH04_2.0-2.45	Nov 10, 2018		Soil	S18-No14996				X					
41	BH04_3.0-3.45	Nov 10, 2018		Soil	S18-No14997				X					
42	BH05_1.5-1.95	Nov 10, 2018		Soil	S18-No14998				X					

Company Name: Cardno (NSW/ACT) Pty Ltd
Address: Level 9, 203 Pacific Highway
St Leonards
NSW 2065

Project Name: KYEEMAGH INFANTS SCHOOL
Project ID: 80818157

Order No.:
Report #: 627289
Phone: 0294967700
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Received: Nov 12, 2018 4:31 PM
Due: Nov 19, 2018
Priority: 5 Day
Contact Name: Ben Withnall

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Acid Sulfate Soils Field pH Test	Eurofins | mgt Suite B15	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X		X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X							
Brisbane Laboratory - NATA Site # 20794									X			X		
Perth Laboratory - NATA Site # 23736														
43	BH05_4.5-4.95	Nov 10, 2018		Soil	S18-No14999				X					
44	TP04_0.4	Nov 10, 2018		Soil	S18-No15000			X						
45	TP08_0.1	Nov 10, 2018		Soil	S18-No15001			X						
46	TP09_0.8	Nov 10, 2018		Soil	S18-No15002			X						
47	TP10_0.4	Nov 10, 2018		Soil	S18-No15003			X						
48	TP12_1.0	Nov 10, 2018		Soil	S18-No15004			X						
49	BH04_0.5-0.95	Nov 10, 2018		Soil	S18-No15005			X						
Test Counts						14	1	6	17	6	25	3	18	7

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

Samples No14961 & No14962 received were less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Authorised by:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Cardno
Shaping the Future

CHAIN OF CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

Contact Person:	Ben Withnall
Telephone Number:	9495 8188
Alternative Contact:	Joel Griffiths
Telephone Number:	9496 7673
Sampler:	Joel Griffiths
Email Address (results and invoice):	ben.withnall@cardno.com.au; joel.griffiths@cardno.com.au
Address:	Level 9 - The Forum, 203 Pacific Highway, St Leonards, New South Wales 2065

Project Name:	Kyeemagh Infants School
Project Number:	80818157
PO No.:	
Project Specific Quote No.:	181029CAR_1
Date results required:	Standard TAT
Report format:	Electronic

Sample Information						Analysis Required												Comments
Cardno Sample ID	Laboratory Sample ID	No. Containers	Preservation	Date sampled	Matrix	B7*1 - TRH/BTEXN/PAH/Metals 8	B15*1 - OCP/OPP/PCB	B8*1 TRH, VOC, PAH, Metals (8)	pH Field Screen (pH and pHfox)	Asbestos (w/w%)	Asbestos Presence / Absence	Suite 21*1: NEPM Screen for Soil Classification	HOLD					
TP03_0.2		2	Ice	10/11/2018	Soil	X	X			X								
TP03_1.2		2	Ice	10/11/2018	Soil			X		X								
TP03_ASB1		2	Ice	10/11/2018	Fibre Cement						X							
TP19_0.1		2	Ice	10/11/2018	Soil	X				X								
TP19_0.3		2	Ice	10/11/2018	Soil	X				X								
TP01_0.2		2	Ice	10/11/2018	Soil	X				X								
TP01_0.9		2	Ice	10/11/2018	Soil	X												
TP02_0.1		2	Ice	10/11/2018	Soil	X	X			X								
TP02_0.4		2	Ice	10/11/2018	Soil	X				X								
TP04_0.1		2	Ice	10/11/2018	Soil	X	X			X								
TP04_0.4		2	Ice	10/11/2018	Soil								X					
TP05_0.1		2	Ice	10/11/2018	Soil	X				X								
TP05_0.9		2	Ice	10/11/2018	Soil			X				X						
TP06_0.1		2	Ice	10/11/2018	Soil	X				X								
TP06_0.3		2	Ice	10/11/2018	Soil			X										
TP07_0.1		2	Ice	10/11/2018	Soil	X				X								
TP07_0.4		2	Ice	10/11/2018	Soil	X						X						
TP07_0.6		2	Ice	10/11/2018	Soil	X												
TP08_0.1		2	Ice	10/11/2018	Soil								X					
TP08_0.4		2	Ice	10/11/2018	Soil			X										
TP09_0.3		2	Ice	10/11/2018	Soil	X				X								
TP09_0.8		2	Ice	10/11/2018	Soil								X					
TP10_0.1		2	Ice	10/11/2018	Soil	X												
TP10_0.4		2	Ice	10/11/2018	Soil								X					
TP11_0.2		2	Ice	10/11/2018	Soil	X	X			X								
TP11_1.2		2	Ice	10/11/2018	Soil			X										
TP12_0.2		2	Ice	10/11/2018	Soil	X	X			X		X						
TP12_1.0		2	Ice	10/11/2018	Soil								X					
QA100		2	Ice	10/11/2018	Soil		X	X										
QA200		2	Ice	10/11/2018	Soil													Please Forward to ALS
BH4_0.4		1	Ice	10/11/2018	Soil	X												
BH05_0.2-0.5		1	Ice	10/11/2018	Soil			X										
BH01_1.0-1.45		1	Frozen	10/11/2018	Soil				X									
BH01_2.5-2.95		1	Frozen	10/11/2018	Soil				X									
BH05_3.0-3.45		1	Frozen	10/11/2018	Soil				X									
BH01_4.0-4.45		1	Frozen	10/11/2018	Soil				X									
BH01_5.5-5.95		1	Frozen	10/11/2018	Soil				X									
BH01_7.0-7.45		1	Frozen	10/11/2018	Soil				X									
BH01_8.5-8.95		1	Frozen	10/11/2018	Soil				X									
BH01_10.0-10.45		1	Frozen	10/11/2018	Soil				X									
BH01_11.0-11.45		1	Frozen	10/11/2018	Soil				X									
BH01_13.0-13.45		1	Frozen	10/11/2018	Soil				X									
BH01_14.5-14.95		1	Frozen	10/11/2018	Soil				X									
BH01_16.0-16.45		1	Frozen	10/11/2018	Soil				X									
BH04_0.5-0.95		1	Frozen	10/11/2018	Soil				X									
BH04_2.0-2.45		1	Frozen	10/11/2018	Soil				X									
BH04_3.0-3.45		1	Frozen	10/11/2018	Soil				X									
BH05_1.5-1.95		1	Frozen	10/11/2018	Soil				X									
BH05_4.5-4.95		1	Frozen	10/11/2018	Soil				X									

Relinquished by: Joel Griffiths
(name / company) Cardno
Date & Time: 12/11/18: 12:00
Signature: JG

Received by: Luca D.
(name / company) Eurofins MGT
Date & Time: 12/11/18 4:31 PM
Signature:

Relinquished by:
(name / company
Date & Time:
Signature:

Received by:
(name / company)
Date & Time:
Signature:

Relinquished by:
(name / company)
Date & Time:
Signature:

Received by:
(name / company)
Date & Time:
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Relinquished by:
(name / company)
Date & Time:
Signature:

Received by:
(name / company
Date & Time:
Signature:

Relinquished by:
(name / company)
Date & Time:
Signature:

Lab use:
Samples Received: [✓ Cool] or Ambient (circle one)
Temperature Received at: 4.5°C (if applicable)
Transported by: Hand delivered / [✓ courier]

#627289

Sample Receipt Advice

Company name:	**Cardno (NSW/ACT) Pty Ltd**
Contact name:	Ben Withnall
Project name:	KYEEMAGH INFANTS SCHOOL
Project ID:	80818157
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Nov 12, 2018 4:31 PM
Eurofins | mgt reference:	**627289**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

Sample QA200 forwarded to ALS. Extra Jar received (BH04_0.5-0.95) placed on hold.

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Ben Withnall - ben.withnall@cardno.com.au.

Note: A copy of these results will also be delivered to the general Cardno (NSW/ACT) Pty Ltd email address.

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Cardno (NSW/ACT) Pty Ltd
Level 9, 203 Pacific Highway
St Leonards
NSW 2065

Attention:	Ben Withnall
Report	629407-AID
Project Name	ADDITIONAL - KYEEMAGH INFANTS SCHOOL
Project ID	80818157
Received Date	Nov 22, 2018
Date Reported	Nov 29, 2018

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name	ADDITIONAL - KYEEMAGH INFANTS SCHOOL
Project ID	80818157
Date Sampled	Nov 10, 2018
Report	629407-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
TP04_0.4	18-No31520	Nov 10, 2018	Approximate Sample 816 Sample consisted of: Gray coarse-grained sandy soil	ACM: Chrysotile asbestos detected in fibre cement fragments. Approximate raw weight of ACM = 16g Total estimated asbestos content in ACM = 1.6g* Total estimated asbestos concentration in ACM = 0.19% w/w* Organic fibre detected. No respirable fibres detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	**Testing Site**	**Extracted**	**Holding Time**
Asbestos - LTM-ASB-8020	Sydney	Nov 23, 2018	Indefinite

Company Name: Cardno (NSW/ACT) Pty Ltd
Address: Level 9, 203 Pacific Highway
St Leonards
NSW 2065

Order No.:
Report #: 629407
Phone: 0294967700
Fax: 02 9499 3902

Received: Nov 22, 2018 12:04 PM
Due: Nov 29, 2018
Priority: 5 Day
Contact Name: Ben Withnall

Project Name: ADDITIONAL - KYEEMAGH INFANTS SCHOOL
Project ID: 80818157

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	TP04_0.4	Nov 10, 2018		Soil	S18-No31520	X
Test Counts						1

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Authorised by:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Cardno
Shaping the Future

CHAIN OF CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

629407

Contact Person: Ben Withnall
Telephone Number: 9496 8188
Alternative Contact: Joel Griffiths
Telephone Number: 9496 7873
Sampler: Joel Griffiths
Email Address (results and invoice): ben.withnall@cardno.com.au; joel.griffiths@cardno.com.au
Address: Level 9 - The Forum, 203 Pacific Highway, St Leonards, New South Wales 2066

Project Name: Kyeemagh Infants School
Project Number: 80818157
PO No.:
Project Specific Quote No. : 181029CAR_1
Date results required: Standard TAT
Report format: Electronic

Sample information						Analysis Required												Comments
Cardno Sample ID	Laboratory Sample ID	No. Containers	Preservation	Date sampled	Matrix	B7*1 - TRH/BTEXN/PAH/Metals 8	B15*1 - OCP/OPP/PCB	B8*1 TRH, VOC, PAH, Metals (8)	pH Field Screen (pH and pHfox)	Asbestos (w/w%)	Asbestos Presence / Absence	Suite 21*1: NEPM Screen for Soil Classification	HOLD					
TP04_0.4		2	Ice	10/11/2018	Soil					X								

Relinquished by: Joel Griffiths
(name / company) Cardno
Date & Time: 22/11/18: 12:00
Signature: JG

Received by:
(name / company) UhaNG
Date & Time: 22/11 12-04pm
Signature:

Relinquished by:
(name / company
Date & Time:
Signature:

Received by:
(name / company)
Date & Time:
Signature:

Relinquished by:
(name / company)
Date & Time:
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(name / company)
Date & Time:
Signature:

Received by:
(name / company
Date & Time:
Signature:

Relinquished by:
(name / company)
Date & Time:
Signature:

Lab use:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: (if applicable)
Transported by: Hand delivered / courier

To:	Nibha Vaidya; COC NSW
Subject:	RE: Report 627289 : Site KYEEMAGH INFANTS SCHOOL (80818157) - TP04_0.4 ASB analysis

From: Joel Griffiths [mailto:joel.griffiths@cardno.com.au]
Sent: Thursday, 22 November 2018 12:04 PM
To: Nibha Vaidya
Cc: Ben Withnall
Subject: Report 627289 : Site KYEEMAGH INFANTS SCHOOL (80818157) - TP04_0.4 ASB analysis

EXTERNAL EMAIL*

Hello Nibha,

Sorry to bug you again! Going through my notes from the other weekends field work it looks as though there was piece of FC in the ASB bag taken for TP04_0.4. Could we please have this sample analysed? I have attached the relevant COC. Thanks a million!

Kind regards,

Joel Griffiths
ENVIRONMENTAL SCIENTIST
CARDNO

Phone Direct +61 2 9496 7873;
Address Level 9, The Forum, 203 Pacific Highway, St Leonards, New South Wales 2065 Australia

Email joel.griffiths@cardno.com.au Web www.cardno.com

CONNECT WITH CARDNO

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Sample Receipt Advice

Company name:	**Cardno (NSW/ACT) Pty Ltd**
Contact name:	Ben Withnall
Project name:	ADDITIONAL - KYEEMAGH INFANTS SCHOOL
Project ID:	80818157
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Nov 22, 2018 12:04 PM
Eurofins | mgt reference:	**629407**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Ben Withnall - ben.withnall@cardno.com.au.

Note: A copy of these results will also be delivered to the general Cardno (NSW/ACT) Pty Ltd email address.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order : **ES1833866**
Client : **CARDNO (NSW/ACT) PTY LTD**
Contact : MR BEN WITHNALL
Address : Level 9 The Forum 203 Pacific Highway
St Leonards NSW 2065
Telephone : +61 2 9495 8188
Project : 80818157 Kyeemagh Infants School
Order number :
C-O-C number : ----
Sampler : Joel Griffiths
Site : ----
Quote number : EN/222 - Secondary Work
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 9
Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 13-Nov-2018 14:30
Date Analysis Commenced : 15-Nov-2018
Issue Date : 19-Nov-2018 15:37

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
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	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 sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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

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

- 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, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**QA200**	**----**	**----**	**----**	**----**
			Client sampling date / time	10-Nov-2018 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1833866-001**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**3.9**	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	<2	----	----	----	----
Copper	7440-50-8	5	mg/kg	<5	----	----	----	----
Lead	7439-92-1	5	mg/kg	**8**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	<2	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**10**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	----
^ **Total Chlordane (sum)**	----	0.05	mg/kg	<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	----	----	----

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL)**

			Client sample ID	**QA200**	**----**	**----**	**----**	**----**
			Client sampling date / time	10-Nov-2018 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1833866-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued								
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	----	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	----	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	----	----	----	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	----	----	----	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	----	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	----	----	----	----
Malathion	121-75-5	0.05	mg/kg	<0.05	----	----	----	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	----	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	----	----	----	----
Parathion	56-38-2	0.2	mg/kg	<0.2	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	----	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	----	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	----	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	----	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	----	----	----	----
Ethion	563-12-2	0.05	mg/kg	<0.05	----	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	----	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	0.5	mg/kg	<0.5	----	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	----	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	----	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	----	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	----	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**QA200**	**----**	**----**	**----**	**----**
			Client sampling date / time	10-Nov-2018 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1833866-001**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons - Continued								
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	----	----	----	----
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	5	mg/kg	<5	----	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	----	----	----	----
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	----	----	----	----
EP074C: Sulfonated Compounds								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	----	----	----	----
EP074D: Fumigants								
2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	----	----	----	----
1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	----	----	----	----
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	----	----	----	----
Chloromethane	74-87-3	5	mg/kg	<5	----	----	----	----
Vinyl chloride	75-01-4	5	mg/kg	<5	----	----	----	----
Bromomethane	74-83-9	5	mg/kg	<5	----	----	----	----
Chloroethane	75-00-3	5	mg/kg	<5	----	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	----	----	----	----
1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	----	----	----	----
Iodomethane	74-88-4	0.5	mg/kg	<0.5	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	----	----	----	----
1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	----	----	----	----
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	----	----	----	----
1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	----	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	----	----	----	----
1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	----	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	----	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	----	----	----	----
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	----	----	----	----
1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**QA200**	**----**	**----**	**----**	**----**
			Client sampling date / time	10-Nov-2018 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1833866-001**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EP074E: Halogenated Aliphatic Compounds - Continued								
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	----	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	----	----	----	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	----	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	----	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	----	----	----	----
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	----	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	----	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	----	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	----	----	----	----
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	----	----	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	----	----	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	----	----	----	----
EP074G: Trihalomethanes								
Chloroform	67-66-3	0.5	mg/kg	<0.5	----	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	----	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	----	----	----	----
Bromoform	75-25-2	0.5	mg/kg	<0.5	----	----	----	----
EP074H: Naphthalene								
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**QA200**	**----**	**----**	**----**	**----**
			Client sampling date / time	10-Nov-2018 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1833866-001**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	**0.6**	----	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	**1.2**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	<50	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	<50	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL)**

			Client sample ID	**QA200**	**----**	**----**	**----**	**----**
			Client sampling date / time	10-Nov-2018 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1833866-001**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EP080: BTEXN - Continued								
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	----	----	----	----
^ **Total Xylenes**	----	0.5	mg/kg	<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	**90.5**	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**104**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**70.1**	----	----	----	----
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.5	%	**87.4**	----	----	----	----
Toluene-D8	2037-26-5	0.5	%	**99.2**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.5	%	**96.0**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**94.8**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**83.6**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**55.6**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**90.8**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	**91.8**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	**94.0**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**93.1**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	**100**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	**98.3**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

QUALITY CONTROL REPORT

Work Order	: **ES1833866**	Page	: 1 of 14
Client	: **CARDNO (NSW/ACT) PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WITHNALL	Contact	: Customer Services ES
Address	: Level 9 The Forum 203 Pacific Highway St Leonards NSW 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 2 9495 8188	Telephone	: +61-2-8784 8555
Project	: 80818157 Kyeemagh Infants School	Date Samples Received	: 13-Nov-2018
Order number	:	Date Analysis Commenced	: 15-Nov-2018
C-O-C number	: ----	Issue Date	: 19-Nov-2018
Sampler	: Joel Griffiths		
Site	: ----		
Quote number	: EN/222 - Secondary Work		
No. of samples received	: 1		
No. of samples analysed	: 1		

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 Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	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 hig

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2038764)									
ES1833836-021	Anonymous	EA055: Moisture Content	----	0.1	%	2.5	2.3	8.03	No Limit
ES1833855-001	Anonymous	EA055: Moisture Content	----	0.1	%	11.1	9.5	16.1	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 2040220)									
ES1833912-003	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	29	34	15.1	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	15	15	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	8	6	32.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	37	34	8.78	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	147	164	11.2	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	100	85	15.6	0% - 50%
ES1833803-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	18	18	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	18	17	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	9	8	19.1	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	190	194	2.17	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	283	310	9.06	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	590	568	3.92	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2040221)									
ES1833912-003	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.7	0.1	148	No Limit
ES1833803-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	1.0	1.5	38.6	0% - 50%
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 2036442)									
ES1833803-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2036441)									
ES1833803-001	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2036441) - continued									
ES1833803-001	Anonymous	EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 2036441)									
ES1833803-001	Anonymous	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 2037823)									
ES1834031-003	Anonymous	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1834013-004	Anonymous	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074B: Oxygenated Compounds (QC Lot: 2037823)									
ES1834031-003	Anonymous	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.00	No Limit
ES1834013-004	Anonymous	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 2037823)									
ES1834031-003	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1834013-004	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074D: Fumigants (QC Lot: 2037823)									
ES1834031-003	Anonymous	EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1834013-004	Anonymous	EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074D: Fumigants (QC Lot: 2037823) - continued									
ES1834013-004	Anonymous	EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 2037823)									
ES1834031-003	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.00	No Limit
ES1834013-004	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 2037823) - continued									
ES1834013-004	Anonymous	EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 2037823)									
ES1834031-003	Anonymous	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1834013-004	Anonymous	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 2037823)									
ES1834031-003	Anonymous	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074G: Trihalomethanes (QC Lot: 2037823) - continued									
ES1834031-003	Anonymous	EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1834013-004	Anonymous	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074H: Naphthalene (QC Lot: 2037823)									
ES1834031-003	Anonymous	EP074: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1834013-004	Anonymous	EP074: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2036440)									
ES1833803-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	0.9	0.8	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	2.8	2.6	8.23	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	1.1	0.9	20.5	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	6.6	6.4	2.42	0% - 50%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	6.2	6.3	2.32	0% - 50%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	4.6	4.3	6.04	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	3.6	3.4	4.54	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	5.4	5.7	6.36	0% - 50%
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	1.9	2.0	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	4.3	4.7	8.53	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	2.1	2.4	10.2	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	0.5	0.6	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	2.9	3.1	7.92	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	42.9	43.2	0.697	0% - 20%
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	6.3	6.8	8.26	0% - 50%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2036439)									
ES1833803-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	190	160	17.4	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	140	140	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2037822)									
ES1834013-004	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2036439)									
ES1833803-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	290	250	14.6	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2036439) - continued									
ES1833803-001	Anonymous	EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2037822)									
ES1834013-004	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 2037822)									
ES1834013-004	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

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

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

Sub-Matrix: **SOIL**				*Method Blank (MB) Report*	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Recovery Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EG005T: Total Metals by ICP-AES (QCLot: 2040220)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	102	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	101	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	93.5	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	100	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	103	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	105	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	107	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2040221)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	75.1	70	105
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 2036442)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	103	62	126
EP068A: Organochlorine Pesticides (OC) (QCLot: 2036441)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	89.1	69	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	91.8	65	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	99.1	67	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	88.3	68	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	96.0	65	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	83.1	67	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	93.5	69	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	94.3	62	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	104	63	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	93.0	66	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	93.9	64	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	94.7	66	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	105	67	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	97.8	67	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	99.9	69	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	100.0	69	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	85.5	56	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	104	62	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	88.4	66	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	96.8	64	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	79.8	54	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2036441)								

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2036441) - continued								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	83.7	59	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	86.7	62	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	108	54	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	97.1	67	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	87.7	70	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	87.4	72	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	82.8	68	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	77.4	68	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	92.6	69	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	97.1	76	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	94.2	64	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	86.4	70	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	86.7	69	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	94.6	66	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	95.4	68	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	94.2	62	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	93.2	68	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	95.3	65	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	64.4	41	123
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2037823)								
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	87.5	67	113
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	84.0	65	117
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	83.3	66	122
EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	83.7	68	118
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	82.6	69	119
EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	84.1	69	117
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	82.9	69	115
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	84.4	66	118
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	84.4	59	125
EP074B: Oxygenated Compounds (QCLot: 2037823)								
EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	10 mg/kg	58.1	30	156
EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	10 mg/kg	81.9	58	136
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	10 mg/kg	82.7	62	132
EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	10 mg/kg	78.4	54	136
EP074C: Sulfonated Compounds (QCLot: 2037823)								
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	81.0	54	126
EP074D: Fumigants (QCLot: 2037823)								
EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	85.7	60	126

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP074D: Fumigants (QCLot: 2037823) - continued								
EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	82.1	68	124
EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	85.6	51	119
EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	85.3	52	114
EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	84.5	63	115
EP074E: Halogenated Aliphatic Compounds (QCLot: 2037823)								
EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	10 mg/kg	35.5	30	148
EP074: Chloromethane	74-87-3	5	mg/kg	<5	10 mg/kg	65.1	41	141
EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	10 mg/kg	68.8	43	147
EP074: Bromomethane	74-83-9	5	mg/kg	<5	10 mg/kg	68.5	47	141
EP074: Chloroethane	75-00-3	5	mg/kg	<5	10 mg/kg	78.0	49	143
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	10 mg/kg	79.5	49	135
EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	84.3	54	126
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	102	43	129
EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	88.6	64	120
EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	86.9	67	125
EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	87.4	69	121
EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	86.0	65	117
EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	85.8	65	123
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	82.9	59	125
EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	83.1	65	125
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	82.7	70	118
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	82.0	68	118
EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	85.9	64	126
EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	88.3	68	122
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	93.2	67	143
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	82.8	62	122
EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	84.2	54	128
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	83.8	55	129
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	80.2	65	121
EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	86.4	61	125
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	74.4	20	134
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	80.1	53	129
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	82.0	50	128
EP074F: Halogenated Aromatic Compounds (QCLot: 2037823)								
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	86.9	68	116
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	84.7	70	114
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	82.4	68	122
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	85.2	67	123
EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	81.8	70	116

Sub-Matrix**: SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP074F: Halogenated Aromatic Compounds (QCLot: 2037823) - continued								
EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	82.1	67	117
EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	79.9	70	114
EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	83.4	48	122
EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	80.7	52	122
EP074G: Trihalomethanes (QCLot: 2037823)								
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	86.0	66	124
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	82.0	61	121
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	86.4	63	121
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	82.7	60	126
EP074H: Naphthalene (QCLot: 2037823)								
EP074: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	82.4	67	129
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2036440)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	93.7	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	94.8	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	90.8	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	90.4	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	90.7	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	88.5	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	93.6	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	91.3	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	90.6	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	88.6	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	96.8	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	97.4	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	91.3	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	93.8	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	92.7	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	95.3	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2036439)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	112	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	110	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	100	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2037822)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	80.7	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2036439)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	112	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	106	74	138

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2036439) - continued								
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	89.4	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2037822)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	82.2	68	128
EP080: BTEXN (QCLot: 2037822)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	86.8	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	85.6	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	85.5	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	85.7	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	85.3	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	83.3	63	119

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
				Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 2040220)							
ES1833803-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	94.8	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	101	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	97.6	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	115	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	80.9	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	101	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	130	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2040221)							
ES1833803-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	93.3	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 2036442)							
ES1833803-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	103	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 2036441)							
ES1833803-001	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	93.6	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	104	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	90.6	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	100	70	130
		EP068: Endrin	72-20-8	2 mg/kg	92.7	70	130

Sub-Matrix: **SOIL**

Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Matrix Spike (MS) Report*			
				Spike	*SpikeRecovery(%)*	*Recovery Limits (%)*	
				Concentration	*MS*	*Low*	*High*
EP068A: Organochlorine Pesticides (OC) (QCLot: 2036441) - continued							
ES1833803-001	Anonymous	EP068: 4.4`-DDT	50-29-3	2 mg/kg	99.0	70	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2036441)							
ES1833803-001	Anonymous	EP068: Diazinon	333-41-5	0.5 mg/kg	102	70	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	98.0	70	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	98.5	70	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	95.8	70	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	93.8	70	130
EP074E: Halogenated Aliphatic Compounds (QCLot: 2037823)							
ES1834013-004	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	2.5 mg/kg	92.6	70	130
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	86.2	70	130
EP074F: Halogenated Aromatic Compounds (QCLot: 2037823)							
ES1834013-004	Anonymous	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	89.9	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2036440)							
ES1833803-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	91.5	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	102	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2036439)							
ES1833803-001	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	103	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	110	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	114	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2037822)							
ES1834013-004	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	91.8	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2036439)							
ES1833803-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	102	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	110	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	111	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2037822)							
ES1834013-004	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	94.1	70	130
EP080: BTEXN (QCLot: 2037822)							
ES1834013-004	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	90.1	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	92.8	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	92.2	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	91.1	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	92.7	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	91.0	70	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1833866**	Page	: 1 of 6
Client	: **CARDNO (NSW/ACT) PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WITHNALL	Telephone	: +61-2-8784 8555
Project	: 80818157 Kyeemagh Infants School	Date Samples Received	: 13-Nov-2018
Site	: ----	Issue Date	: 19-Nov-2018
Sampler	: Joel Griffiths	No. of samples received	: 1
Order number	:	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) QA200	**10-Nov-2018**	**----**	----	----	**15-Nov-2018**	24-Nov-2018	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) QA200	**10-Nov-2018**	**16-Nov-2018**	09-May-2019	✓	**16-Nov-2018**	09-May-2019	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) QA200	**10-Nov-2018**	**16-Nov-2018**	08-Dec-2018	✓	**16-Nov-2018**	08-Dec-2018	✓
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066) QA200	**10-Nov-2018**	**15-Nov-2018**	24-Nov-2018	✓	**16-Nov-2018**	25-Dec-2018	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068) QA200	**10-Nov-2018**	**15-Nov-2018**	24-Nov-2018	✓	**16-Nov-2018**	25-Dec-2018	✓
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068) QA200	**10-Nov-2018**	**15-Nov-2018**	24-Nov-2018	✓	**16-Nov-2018**	25-Dec-2018	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP074) QA200	**10-Nov-2018**	**15-Nov-2018**	17-Nov-2018	✓	**15-Nov-2018**	17-Nov-2018	✓
EP074B: Oxygenated Compounds							
Soil Glass Jar - Unpreserved (EP074) QA200	**10-Nov-2018**	**15-Nov-2018**	17-Nov-2018	✓	**15-Nov-2018**	17-Nov-2018	✓
EP074C: Sulfonated Compounds							
Soil Glass Jar - Unpreserved (EP074) QA200	**10-Nov-2018**	**15-Nov-2018**	17-Nov-2018	✓	**15-Nov-2018**	17-Nov-2018	✓
EP074D: Fumigants							
Soil Glass Jar - Unpreserved (EP074) QA200	**10-Nov-2018**	**15-Nov-2018**	17-Nov-2018	✓	**15-Nov-2018**	17-Nov-2018	✓

Matrix: **SOIL**

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

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EP074E: Halogenated Aliphatic Compounds							
Soil Glass Jar - Unpreserved (EP074) QA200	**10-Nov-2018**	**15-Nov-2018**	17-Nov-2018	✓	**15-Nov-2018**	17-Nov-2018	✓
EP074F: Halogenated Aromatic Compounds							
Soil Glass Jar - Unpreserved (EP074) QA200	**10-Nov-2018**	**15-Nov-2018**	17-Nov-2018	✓	**15-Nov-2018**	17-Nov-2018	✓
EP074G: Trihalomethanes							
Soil Glass Jar - Unpreserved (EP074) QA200	**10-Nov-2018**	**15-Nov-2018**	17-Nov-2018	✓	**15-Nov-2018**	17-Nov-2018	✓
EP074H: Naphthalene							
Soil Glass Jar - Unpreserved (EP074) QA200	**10-Nov-2018**	**15-Nov-2018**	17-Nov-2018	✓	**15-Nov-2018**	17-Nov-2018	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) QA200	**10-Nov-2018**	**15-Nov-2018**	24-Nov-2018	✓	**16-Nov-2018**	25-Dec-2018	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) QA200	**10-Nov-2018**	**15-Nov-2018**	24-Nov-2018	✓	**15-Nov-2018**	24-Nov-2018	✓
Soil Glass Jar - Unpreserved (EP071) QA200	**10-Nov-2018**	**15-Nov-2018**	24-Nov-2018	✓	**16-Nov-2018**	25-Dec-2018	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080) QA200	**10-Nov-2018**	**15-Nov-2018**	24-Nov-2018	✓	**15-Nov-2018**	24-Nov-2018	✓
Soil Glass Jar - Unpreserved (EP071) QA200	**10-Nov-2018**	**15-Nov-2018**	24-Nov-2018	✓	**16-Nov-2018**	25-Dec-2018	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) QA200	**10-Nov-2018**	**15-Nov-2018**	24-Nov-2018	✓	**15-Nov-2018**	24-Nov-2018	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
Volatile Organic Compounds	EP074	SOIL	In house: Referenced to USEPA SW 846 - 8260B Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

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Shaping the Future

CHAIN OF CUSTODY AND ANALYSÍS REQUEST

Page 1 of 1

Contact Person: Ben Withnall
Telephone Number: 9496 8198
Alternative Contact: Joel Griffiths
Telephone Number: 9496 7873
Sampler: Joel Griffiths
Email Address (results and invoice): ben.withnall@cardno.com.au; joel.griffiths@cardno.com.au
Address: Level 9 - The Forum, 203 Pacific Highway, St Leonards, New South Wales 2065

Project Name: Kyeemagh Infants School
Project Number: 80818157
PO No.:
Project Specific Quote No. : 181029CAR_1
Date results required: Standard TAT
Report format: Electronic

Sample Information						Analysis Required								Comments
Cardno Sample ID	Laboratory Sample ID	No. Containers	Preservation	Date sampled	Matrix	B7*1 - TRH/BTEXN/PAH/Metals 8	B15*1 - OCP/OPP/PCB	B8*1 TRH, VOC, PAH, Metals (8)	pH Field Screen (pH and pHfox)	Asbestos (w/w%)	Asbestos Presence / Absence	Suite 21*1: NEPM Screen for Soil Classification	HOLD	
QA200		2	Ice	10/11/2018	Soil		X	X						

Environmental Division
Sydney
Work Order Reference
ES1833866
Telephone : + 61-2-8784 8555

Relinquished by: Joel Griffiths
(name / company) Cardno
Date & Time: 12/11/18: 12:00
Signature: JG

Received by:
(name / company)
Date & Time:
Signature:

Received by:
(name / company)
Date & Time:
Signature:

Relinquished by:
(name / company)
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(name / company)
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Signature:

Relinquished by:
(name / company)
Date & Time:
Signature:

Lab use:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: (if applicable)
Transported by: Hand delivered / courier

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Cardno (NSW/ACT) Pty Ltd
Level 9, 203 Pacific Highway
St Leonards
NSW 2065

Attention: **Ben Withnall**

Report **628416-S**
Project name KYEEMAGH INFANTS SCHOOL
Project ID 80818157
Received Date Nov 19, 2018

Client Sample ID			**TP13_0.1**	**TP14_0.7**	**TP15_0.1**	**TP15_0.6**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No24227**	**S18-No24230**	**S18-No24231**	**S18-No24232**
Date Sampled			**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	70	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	290	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	360	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	141	-	55	-
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.1-Dichloroethene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.2-Dibromoethane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.2-Dichloroethane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.2-Dichloropropane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.2.4-Trimethylbenzene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.3-Dichloropropane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.3.5-Trimethylbenzene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
2-Butanone (MEK)	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
2-Propanone (Acetone)	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
4-Chlorotoluene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Allyl chloride	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5

Client Sample ID			**TP13_0.1**	**TP14_0.7**	**TP15_0.1**	**TP15_0.6**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No24227**	**S18-No24230**	**S18-No24231**	**S18-No24232**
Date Sampled			**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**
Test/Reference	LOR	Unit				
Volatile Organics						
Benzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Bromobenzene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Bromochloromethane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Bromodichloromethane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Bromoform	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Bromomethane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Carbon disulfide	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Carbon Tetrachloride	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Chlorobenzene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Chloroethane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Chloroform	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Chloromethane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
cis-1.2-Dichloroethene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
cis-1.3-Dichloropropene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Dibromochloromethane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Dibromomethane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Dichlorodifluoromethane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Iodomethane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Isopropyl benzene (Cumene)	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Methylene Chloride	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Styrene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Tetrachloroethene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Toluene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
trans-1.2-Dichloroethene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
trans-1.3-Dichloropropene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Trichloroethene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Trichlorofluoromethane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Vinyl chloride	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	-	< 0.3
Total MAH*	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
4-Bromofluorobenzene (surr.)	1	%	141	126	-	144
Toluene-d8 (surr.)	1	%	116	115	-	130
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	270	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	240	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	510	< 100	< 100	< 100

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**TP13_0.1** **Soil** **S18-No24227** **Nov 17, 2018**	**TP14_0.7** **Soil** **S18-No24230** **Nov 17, 2018**	**TP15_0.1** **Soil** **S18-No24231** **Nov 17, 2018**	**TP15_0.6** **Soil** **S18-No24232** **Nov 17, 2018**
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	0.9	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	1.2	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.5	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	1.1	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	0.7	< 0.5
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	0.7	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	1.0	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	1.3	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	0.8	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	1.3	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	6.9	< 0.5
2-Fluorobiphenyl (surr.)	1	%	101	111	136	59
p-Terphenyl-d14 (surr.)	1	%	98	72	83	58
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	< 0.05
a-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
b-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
d-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Toxaphene	1	mg/kg	< 1	-	-	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	85	-	-	73
Tetrachloro-m-xylene (surr.)	1	%	70	-	-	89

Client Sample ID			**TP13_0.1**	**TP14_0.7**	**TP15_0.1**	**TP15_0.6**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No24227**	**S18-No24230**	**S18-No24231**	**S18-No24232**
Date Sampled			**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Bolstar	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Coumaphos	2	mg/kg	< 2	-	-	< 2
Demeton-S	0.2	mg/kg	< 0.2	-	-	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	-	-	< 0.2
Diazinon	0.2	mg/kg	< 0.2	-	-	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	-	-	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	-	-	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	-	-	< 0.2
EPN	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethion	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fenthion	0.2	mg/kg	< 0.2	-	-	< 0.2
Malathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Merphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Monocrotophos	2	mg/kg	< 2	-	-	< 2
Naled	0.2	mg/kg	< 0.2	-	-	< 0.2
Omethoate	2	mg/kg	< 2	-	-	< 2
Phorate	0.2	mg/kg	< 0.2	-	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	-	-	< 0.2
Ronnel	0.2	mg/kg	< 0.2	-	-	< 0.2
Terbufos	0.2	mg/kg	< 0.2	-	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	-	-	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	-	-	< 0.2
Triphenylphosphate (surr.)	1	%	97	-	-	53
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	-	-	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	85	-	-	73
Tetrachloro-m-xylene (surr.)	1	%	70	-	-	89

Client Sample ID			**TP13_0.1**	**TP14_0.7**	**TP15_0.1**	**TP15_0.6**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No24227**	**S18-No24230**	**S18-No24231**	**S18-No24232**
Date Sampled			**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	32	< 5	< 5	< 5
Copper	5	mg/kg	12	< 5	16	< 5
Lead	5	mg/kg	11	< 5	65	< 5
Mercury	0.1	mg/kg	< 0.1	< 0.1	0.1	< 0.1
Nickel	5	mg/kg	30	< 5	< 5	< 5
Zinc	5	mg/kg	40	< 5	43	120
% Moisture	1	%	3.4	1.9	2.7	2.8

Client Sample ID			**TP16_0.1**	**TP16_0.8**	**TP17_0.5**	**TP18_0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No24233**	**S18-No24234**	**S18-No24236**	**S18-No24237**
Date Sampled			**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	-	< 0.1
Toluene	0.1	mg/kg	< 0.1	-	-	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	-	-	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	-	-	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	-	-	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	-	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	51	-	-	57
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	< 0.5	< 0.5	-
1.1-Dichloroethene	0.5	mg/kg	-	< 0.5	< 0.5	-
1.1.1-Trichloroethane	0.5	mg/kg	-	< 0.5	< 0.5	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	< 0.5	< 0.5	-
1.1.2-Trichloroethane	0.5	mg/kg	-	< 0.5	< 0.5	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	< 0.5	< 0.5	-
1.2-Dibromoethane	0.5	mg/kg	-	< 0.5	< 0.5	-
1.2-Dichlorobenzene	0.5	mg/kg	-	< 0.5	< 0.5	-
1.2-Dichloroethane	0.5	mg/kg	-	< 0.5	< 0.5	-
1.2-Dichloropropane	0.5	mg/kg	-	< 0.5	< 0.5	-
1.2.3-Trichloropropane	0.5	mg/kg	-	< 0.5	< 0.5	-
1.2.4-Trimethylbenzene	0.5	mg/kg	-	< 0.5	< 0.5	-
1.3-Dichlorobenzene	0.5	mg/kg	-	< 0.5	< 0.5	-
1.3-Dichloropropane	0.5	mg/kg	-	< 0.5	< 0.5	-
1.3.5-Trimethylbenzene	0.5	mg/kg	-	< 0.5	< 0.5	-
1.4-Dichlorobenzene	0.5	mg/kg	-	< 0.5	< 0.5	-
2-Butanone (MEK)	0.5	mg/kg	-	< 0.5	< 0.5	-

Client Sample ID			**TP16_0.1**	**TP16_0.8**	**TP17_0.5**	**TP18_0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No24233**	**S18-No24234**	**S18-No24236**	**S18-No24237**
Date Sampled			**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**
Test/Reference	LOR	Unit				
Volatile Organics						
2-Propanone (Acetone)	0.5	mg/kg	-	< 0.5	< 0.5	-
4-Chlorotoluene	0.5	mg/kg	-	< 0.5	< 0.5	-
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	-	< 0.5	< 0.5	-
Allyl chloride	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzene	0.1	mg/kg	-	< 0.1	< 0.1	-
Bromobenzene	0.5	mg/kg	-	< 0.5	< 0.5	-
Bromochloromethane	0.5	mg/kg	-	< 0.5	< 0.5	-
Bromodichloromethane	0.5	mg/kg	-	< 0.5	< 0.5	-
Bromoform	0.5	mg/kg	-	< 0.5	< 0.5	-
Bromomethane	0.5	mg/kg	-	< 0.5	< 0.5	-
Carbon disulfide	0.5	mg/kg	-	< 0.5	< 0.5	-
Carbon Tetrachloride	0.5	mg/kg	-	< 0.5	< 0.5	-
Chlorobenzene	0.5	mg/kg	-	< 0.5	< 0.5	-
Chloroethane	0.5	mg/kg	-	< 0.5	< 0.5	-
Chloroform	0.5	mg/kg	-	< 0.5	< 0.5	-
Chloromethane	0.5	mg/kg	-	< 0.5	< 0.5	-
cis-1.2-Dichloroethene	0.5	mg/kg	-	< 0.5	< 0.5	-
cis-1.3-Dichloropropene	0.5	mg/kg	-	< 0.5	< 0.5	-
Dibromochloromethane	0.5	mg/kg	-	< 0.5	< 0.5	-
Dibromomethane	0.5	mg/kg	-	< 0.5	< 0.5	-
Dichlorodifluoromethane	0.5	mg/kg	-	< 0.5	< 0.5	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	< 0.1	-
Iodomethane	0.5	mg/kg	-	< 0.5	< 0.5	-
Isopropyl benzene (Cumene)	0.5	mg/kg	-	< 0.5	< 0.5	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	< 0.2	-
Methylene Chloride	0.5	mg/kg	-	< 0.5	< 0.5	-
o-Xylene	0.1	mg/kg	-	< 0.1	< 0.1	-
Styrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Tetrachloroethene	0.5	mg/kg	-	< 0.5	< 0.5	-
Toluene	0.1	mg/kg	-	< 0.1	< 0.1	-
trans-1.2-Dichloroethene	0.5	mg/kg	-	< 0.5	< 0.5	-
trans-1.3-Dichloropropene	0.5	mg/kg	-	< 0.5	< 0.5	-
Trichloroethene	0.5	mg/kg	-	< 0.5	< 0.5	-
Trichlorofluoromethane	0.5	mg/kg	-	< 0.5	< 0.5	-
Vinyl chloride	0.5	mg/kg	-	< 0.5	< 0.5	-
Xylenes - Total	0.3	mg/kg	-	< 0.3	< 0.3	-
Total MAH*	0.5	mg/kg	-	< 0.5	< 0.5	-
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	-	< 0.5	< 0.5	-
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	-	< 0.5	< 0.5	-
4-Bromofluorobenzene (surr.)	1	%	-	137	136	-
Toluene-d8 (surr.)	1	%	-	118	113	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100

Client Sample ID			**TP16_0.1**	**TP16_0.8**	**TP17_0.5**	**TP18_0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No24233**	**S18-No24234**	**S18-No24236**	**S18-No24237**
Date Sampled			**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	114	115	78	127
p-Terphenyl-d14 (surr.)	1	%	63	71	81	127
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-BHC	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-BHC	0.05	mg/kg	-	-	-	< 0.05
d-BHC	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.05	mg/kg	-	-	-	< 0.05
Toxaphene	1	mg/kg	-	-	-	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	-	-	82
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	80

Client Sample ID			**TP16_0.1**	**TP16_0.8**	**TP17_0.5**	**TP18_0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No24233**	**S18-No24234**	**S18-No24236**	**S18-No24237**
Date Sampled			**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	-	-	< 0.2
Bolstar	0.2	mg/kg	-	-	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	-	-	< 0.2
Chlorpyrifos	0.2	mg/kg	-	-	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	-	-	< 0.2
Coumaphos	2	mg/kg	-	-	-	< 2
Demeton-S	0.2	mg/kg	-	-	-	< 0.2
Demeton-O	0.2	mg/kg	-	-	-	< 0.2
Diazinon	0.2	mg/kg	-	-	-	< 0.2
Dichlorvos	0.2	mg/kg	-	-	-	< 0.2
Dimethoate	0.2	mg/kg	-	-	-	< 0.2
Disulfoton	0.2	mg/kg	-	-	-	< 0.2
EPN	0.2	mg/kg	-	-	-	< 0.2
Ethion	0.2	mg/kg	-	-	-	< 0.2
Ethoprop	0.2	mg/kg	-	-	-	< 0.2
Ethyl parathion	0.2	mg/kg	-	-	-	< 0.2
Fenitrothion	0.2	mg/kg	-	-	-	< 0.2
Fensulfothion	0.2	mg/kg	-	-	-	< 0.2
Fenthion	0.2	mg/kg	-	-	-	< 0.2
Malathion	0.2	mg/kg	-	-	-	< 0.2
Merphos	0.2	mg/kg	-	-	-	< 0.2
Methyl parathion	0.2	mg/kg	-	-	-	< 0.2
Mevinphos	0.2	mg/kg	-	-	-	< 0.2
Monocrotophos	2	mg/kg	-	-	-	< 2
Naled	0.2	mg/kg	-	-	-	< 0.2
Omethoate	2	mg/kg	-	-	-	< 2
Phorate	0.2	mg/kg	-	-	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	-	-	< 0.2
Pyrazophos	0.2	mg/kg	-	-	-	< 0.2
Ronnel	0.2	mg/kg	-	-	-	< 0.2
Terbufos	0.2	mg/kg	-	-	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	-	-	< 0.2
Tokuthion	0.2	mg/kg	-	-	-	< 0.2
Trichloronate	0.2	mg/kg	-	-	-	< 0.2
Triphenylphosphate (surr.)	1	%	-	-	-	124
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1221	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1232	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1242	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1248	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1254	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1260	0.1	mg/kg	-	-	-	< 0.1
Total PCB*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	-	-	82
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	80

Client Sample ID			TP16_0.1	TP16_0.8	TP17_0.5	TP18_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-No24233	S18-No24234	S18-No24236	S18-No24237
Date Sampled			Nov 17, 2018	Nov 17, 2018	Nov 17, 2018	Nov 17, 2018
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	< 5	< 5	< 5
Copper	5	mg/kg	< 5	< 5	< 5	11
Lead	5	mg/kg	17	5.1	< 5	56
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	18	8.3	< 5	130
% Moisture	1	%	1.6	2.7	< 1	1.4

Client Sample ID			TP18_0.4	TP20_0.1	QA300	KYE_TB
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-No24238	S18-No24239	S18-No24240	S18-No24242
Date Sampled			Nov 17, 2018	Nov 17, 2018	Nov 17, 2018	Nov 17, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	-
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	-
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	-
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	-
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	-
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	-	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	71	70	106
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
1.1.1-Trichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.2-Trichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dibromoethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.2.3-Trichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.2.4-Trimethylbenzene	0.5	mg/kg	< 0.5	-	-	-
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
1.3-Dichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.3.5-Trimethylbenzene	0.5	mg/kg	< 0.5	-	-	-
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
2-Butanone (MEK)	0.5	mg/kg	< 0.5	-	-	-

Client Sample ID			**TP18_0.4**	**TP20_0.1**	**QA300**	**KYE_TB**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No24238**	**S18-No24239**	**S18-No24240**	**S18-No24242**
Date Sampled			**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**
Test/Reference	LOR	Unit				
Volatile Organics						
2-Propanone (Acetone)	0.5	mg/kg	< 0.5	-	-	-
4-Chlorotoluene	0.5	mg/kg	< 0.5	-	-	-
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	< 0.5	-	-	-
Allyl chloride	0.5	mg/kg	< 0.5	-	-	-
Benzene	0.1	mg/kg	< 0.1	-	-	-
Bromobenzene	0.5	mg/kg	< 0.5	-	-	-
Bromochloromethane	0.5	mg/kg	< 0.5	-	-	-
Bromodichloromethane	0.5	mg/kg	< 0.5	-	-	-
Bromoform	0.5	mg/kg	< 0.5	-	-	-
Bromomethane	0.5	mg/kg	< 0.5	-	-	-
Carbon disulfide	0.5	mg/kg	< 0.5	-	-	-
Carbon Tetrachloride	0.5	mg/kg	< 0.5	-	-	-
Chlorobenzene	0.5	mg/kg	< 0.5	-	-	-
Chloroethane	0.5	mg/kg	< 0.5	-	-	-
Chloroform	0.5	mg/kg	< 0.5	-	-	-
Chloromethane	0.5	mg/kg	< 0.5	-	-	-
cis-1.2-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
cis-1.3-Dichloropropene	0.5	mg/kg	< 0.5	-	-	-
Dibromochloromethane	0.5	mg/kg	< 0.5	-	-	-
Dibromomethane	0.5	mg/kg	< 0.5	-	-	-
Dichlorodifluoromethane	0.5	mg/kg	< 0.5	-	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	-	-
Iodomethane	0.5	mg/kg	< 0.5	-	-	-
Isopropyl benzene (Cumene)	0.5	mg/kg	< 0.5	-	-	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	-	-
Methylene Chloride	0.5	mg/kg	< 0.5	-	-	-
o-Xylene	0.1	mg/kg	< 0.1	-	-	-
Styrene	0.5	mg/kg	< 0.5	-	-	-
Tetrachloroethene	0.5	mg/kg	< 0.5	-	-	-
Toluene	0.1	mg/kg	< 0.1	-	-	-
trans-1.2-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
trans-1.3-Dichloropropene	0.5	mg/kg	< 0.5	-	-	-
Trichloroethene	0.5	mg/kg	< 0.5	-	-	-
Trichlorofluoromethane	0.5	mg/kg	< 0.5	-	-	-
Vinyl chloride	0.5	mg/kg	< 0.5	-	-	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	-	-
Total MAH*	0.5	mg/kg	< 0.5	-	-	-
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	< 0.5	-	-	-
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	< 0.5	-	-	-
4-Bromofluorobenzene (surr.)	1	%	132	-	-	-
Toluene-d8 (surr.)	1	%	117	-	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	-
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20	< 20	< 20	-
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	-
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	-
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	-
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	-

Client Sample ID			**TP18_0.4**	**TP20_0.1**	**QA300**	**KYE_TB**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No24238**	**S18-No24239**	**S18-No24240**	**S18-No24242**
Date Sampled			**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	140	120	108	-
p-Terphenyl-d14 (surr.)	1	%	90	132	69	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	-
a-BHC	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-
b-BHC	0.05	mg/kg	-	< 0.05	-	-
d-BHC	0.05	mg/kg	-	< 0.05	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	-
Endrin ketone	0.05	mg/kg	-	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.05	mg/kg	-	< 0.05	-	-
Toxaphene	1	mg/kg	-	< 1	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	-	90	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	85	-	-

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**TP18_0.4** **Soil** **S18-No24238** **Nov 17, 2018**	**TP20_0.1** **Soil** **S18-No24239** **Nov 17, 2018**	**QA300** **Soil** **S18-No24240** **Nov 17, 2018**	**KYE_TB** **Soil** **S18-No24242** **Nov 17, 2018**
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	< 0.2	-	-
Bolstar	0.2	mg/kg	-	< 0.2	-	-
Chlorfenvinphos	0.2	mg/kg	-	< 0.2	-	-
Chlorpyrifos	0.2	mg/kg	-	< 0.2	-	-
Chlorpyrifos-methyl	0.2	mg/kg	-	< 0.2	-	-
Coumaphos	2	mg/kg	-	< 2	-	-
Demeton-S	0.2	mg/kg	-	< 0.2	-	-
Demeton-O	0.2	mg/kg	-	< 0.2	-	-
Diazinon	0.2	mg/kg	-	< 0.2	-	-
Dichlorvos	0.2	mg/kg	-	< 0.2	-	-
Dimethoate	0.2	mg/kg	-	< 0.2	-	-
Disulfoton	0.2	mg/kg	-	< 0.2	-	-
EPN	0.2	mg/kg	-	< 0.2	-	-
Ethion	0.2	mg/kg	-	< 0.2	-	-
Ethoprop	0.2	mg/kg	-	< 0.2	-	-
Ethyl parathion	0.2	mg/kg	-	< 0.2	-	-
Fenitrothion	0.2	mg/kg	-	< 0.2	-	-
Fensulfothion	0.2	mg/kg	-	< 0.2	-	-
Fenthion	0.2	mg/kg	-	< 0.2	-	-
Malathion	0.2	mg/kg	-	< 0.2	-	-
Merphos	0.2	mg/kg	-	< 0.2	-	-
Methyl parathion	0.2	mg/kg	-	< 0.2	-	-
Mevinphos	0.2	mg/kg	-	< 0.2	-	-
Monocrotophos	2	mg/kg	-	< 2	-	-
Naled	0.2	mg/kg	-	< 0.2	-	-
Omethoate	2	mg/kg	-	< 2	-	-
Phorate	0.2	mg/kg	-	< 0.2	-	-
Pirimiphos-methyl	0.2	mg/kg	-	< 0.2	-	-
Pyrazophos	0.2	mg/kg	-	< 0.2	-	-
Ronnel	0.2	mg/kg	-	< 0.2	-	-
Terbufos	0.2	mg/kg	-	< 0.2	-	-
Tetrachlorvinphos	0.2	mg/kg	-	< 0.2	-	-
Tokuthion	0.2	mg/kg	-	< 0.2	-	-
Trichloronate	0.2	mg/kg	-	< 0.2	-	-
Triphenylphosphate (surr.)	1	%	-	110	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1232	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1242	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1248	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1254	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1260	0.1	mg/kg	-	< 0.1	-	-
Total PCB*	0.1	mg/kg	-	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	-	90	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	85	-	-

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**TP18_0.4** **Soil** **S18-No24238** **Nov 17, 2018**	**TP20_0.1** **Soil** **S18-No24239** **Nov 17, 2018**	**QA300** **Soil** **S18-No24240** **Nov 17, 2018**	**KYE_TB** **Soil** **S18-No24242** **Nov 17, 2018**
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	< 2	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	-
Chromium	5	mg/kg	< 5	5.3	< 5	-
Copper	5	mg/kg	< 5	12	5.2	-
Lead	5	mg/kg	< 5	42	19	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Nickel	5	mg/kg	< 5	< 5	< 5	-
Zinc	5	mg/kg	< 5	66	20	-
% Moisture	1	%	3.4	3.1	1.6	-

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	R20**KYE_TS** **Soil** **S18-No24243** **Nov 17, 2018**	**BH02_0.5** **Soil** **S18-No24245** **Nov 17, 2018**	**BH2_1.0** **Soil** **S18-No24246** **Nov 17, 2018**	**BH03_0.5** **Soil** **S18-No24247** **Nov 17, 2018**
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	-	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	-	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	-	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	-	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	83	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	82	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	82	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	83	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	84	< 0.1	-	< 0.1
Xylenes - Total	0.3	mg/kg	84	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	101	64	-	66
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	-	< 0.5	-
1.1-Dichloroethene	0.5	mg/kg	-	-	< 0.5	-
1.1.1-Trichloroethane	0.5	mg/kg	-	-	< 0.5	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	-	< 0.5	-
1.1.2-Trichloroethane	0.5	mg/kg	-	-	< 0.5	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	-	< 0.5	-
1.2-Dibromoethane	0.5	mg/kg	-	-	< 0.5	-
1.2-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	-
1.2-Dichloroethane	0.5	mg/kg	-	-	< 0.5	-
1.2-Dichloropropane	0.5	mg/kg	-	-	< 0.5	-
1.2.3-Trichloropropane	0.5	mg/kg	-	-	< 0.5	-
1.2.4-Trimethylbenzene	0.5	mg/kg	-	-	< 0.5	-
1.3-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	-
1.3-Dichloropropane	0.5	mg/kg	-	-	< 0.5	-
1.3.5-Trimethylbenzene	0.5	mg/kg	-	-	< 0.5	-
1.4-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	-
2-Butanone (MEK)	0.5	mg/kg	-	-	< 0.5	-

Client Sample ID			[R20]**KYE_TS**	**BH02_0.5**	**BH2_1.0**	**BH03_0.5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No24243**	**S18-No24245**	**S18-No24246**	**S18-No24247**
Date Sampled			**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**
Test/Reference	LOR	Unit				
Volatile Organics						
2-Propanone (Acetone)	0.5	mg/kg	-	-	< 0.5	-
4-Chlorotoluene	0.5	mg/kg	-	-	< 0.5	-
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	-	-	< 0.5	-
Allyl chloride	0.5	mg/kg	-	-	< 0.5	-
Benzene	0.1	mg/kg	-	-	< 0.1	-
Bromobenzene	0.5	mg/kg	-	-	< 0.5	-
Bromochloromethane	0.5	mg/kg	-	-	< 0.5	-
Bromodichloromethane	0.5	mg/kg	-	-	< 0.5	-
Bromoform	0.5	mg/kg	-	-	< 0.5	-
Bromomethane	0.5	mg/kg	-	-	< 0.5	-
Carbon disulfide	0.5	mg/kg	-	-	< 0.5	-
Carbon Tetrachloride	0.5	mg/kg	-	-	< 0.5	-
Chlorobenzene	0.5	mg/kg	-	-	< 0.5	-
Chloroethane	0.5	mg/kg	-	-	< 0.5	-
Chloroform	0.5	mg/kg	-	-	< 0.5	-
Chloromethane	0.5	mg/kg	-	-	< 0.5	-
cis-1.2-Dichloroethene	0.5	mg/kg	-	-	< 0.5	-
cis-1.3-Dichloropropene	0.5	mg/kg	-	-	< 0.5	-
Dibromochloromethane	0.5	mg/kg	-	-	< 0.5	-
Dibromomethane	0.5	mg/kg	-	-	< 0.5	-
Dichlorodifluoromethane	0.5	mg/kg	-	-	< 0.5	-
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	-
Iodomethane	0.5	mg/kg	-	-	< 0.5	-
Isopropyl benzene (Cumene)	0.5	mg/kg	-	-	< 0.5	-
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	-
Methylene Chloride	0.5	mg/kg	-	-	< 0.5	-
o-Xylene	0.1	mg/kg	-	-	< 0.1	-
Styrene	0.5	mg/kg	-	-	< 0.5	-
Tetrachloroethene	0.5	mg/kg	-	-	< 0.5	-
Toluene	0.1	mg/kg	-	-	< 0.1	-
trans-1.2-Dichloroethene	0.5	mg/kg	-	-	< 0.5	-
trans-1.3-Dichloropropene	0.5	mg/kg	-	-	< 0.5	-
Trichloroethene	0.5	mg/kg	-	-	< 0.5	-
Trichlorofluoromethane	0.5	mg/kg	-	-	< 0.5	-
Vinyl chloride	0.5	mg/kg	-	-	< 0.5	-
Xylenes - Total	0.3	mg/kg	-	-	< 0.3	-
Total MAH*	0.5	mg/kg	-	-	< 0.5	-
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	-	-	< 0.5	-
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	-	-	< 0.5	-
4-Bromofluorobenzene (surr.)	1	%	-	-	130	-
Toluene-d8 (surr.)	1	%	-	-	109	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	-	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	-	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	-	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	-	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	< 100	< 100

Client Sample ID			^{R20}**KYE_TS**	**BH02_0.5**	**BH2_1.0**	**BH03_0.5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No24243**	**S18-No24245**	**S18-No24246**	**S18-No24247**
Date Sampled			**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	98	105	124
p-Terphenyl-d14 (surr.)	1	%	-	79	82	96
Heavy Metals						
Arsenic	2	mg/kg	-	< 2	< 2	< 2
Cadmium	0.4	mg/kg	-	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	-	< 5	< 5	< 5
Copper	5	mg/kg	-	< 5	5.6	< 5
Lead	5	mg/kg	-	9.8	12	7.0
Mercury	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	-	< 5	< 5	< 5
Zinc	5	mg/kg	-	17	24	6.8
% Moisture	1	%	-	18	9.6	2.0

Client Sample ID			**BH02_2.0-2.45**	**BH02_4.0-4.45**	**BH02_5.5-5.95**	**BH02_7.0-7.45**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No24248**	**S18-No24249**	**S18-No24250**	**S18-No24251**
Date Sampled			**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.8	6.8	9.6	8.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.1	5.2	7.5	6.2
Reaction Ratings*^{S05}		comment	1.0	1.0	1.0	4.0

Client Sample ID			BH02_8.5-8.95	BH02_10.0-10.45	BH02_11.5-11.95	BH02_13.0-13.45
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No24252**	**S18-No24253**	**S18-No24254**	**S18-No24255**
Date Sampled			**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.6	9.1	9.0	8.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.9	5.1	4.5	7.9
Reaction Ratings*S05		comment	4.0	4.0	4.0	4.0

Client Sample ID			BH02_14.5-14.95	BH02_16.0-16.45	BH02_17.5-17.95	BH03_1.0-1.1
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No24256**	**S18-No24257**	**S18-No24258**	**S18-No24259**
Date Sampled			**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.8	6.9	6.2	6.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.7	6.4	5.6	5.0
Reaction Ratings*S05		comment	1.0	4.0	4.0	1.0

Client Sample ID			BH03_2.5-2.95	BH03_4.0-4.45	BH03_5.5-5.95	BH03_7.0-7.45
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No24260**	**S18-No24261**	**S18-No24262**	**S18-No24263**
Date Sampled			**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.8	9.3	9.4	9.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.0	7.4	7.5	7.0
Reaction Ratings*S05		comment	2.0	1.0	1.0	2.0

Client Sample ID			BH03_8.5-8.95	BH03_10.0-10.45	BH03_11.5-11.95	BH03_13.0-13.45
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No24264**	**S18-No24265**	**S18-No24266**	**S18-No24267**
Date Sampled			**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.1	8.9	8.1	8.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.2	2.3	4.4	6.1
Reaction Ratings*S05		comment	4.0	4.0	2.0	2.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B8			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Nov 23, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Volatile Organics	Melbourne	Nov 23, 2018	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Nov 23, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Nov 23, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Melbourne	Nov 23, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Melbourne	Nov 23, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins | mgt Suite B7			
BTEX	Melbourne	Nov 23, 2018	14 Day
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Eurofins | mgt Suite B15			
Organochlorine Pesticides	Melbourne	Nov 23, 2018	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Melbourne	Nov 23, 2018	14 Day
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Polychlorinated Biphenyls	Melbourne	Nov 23, 2018	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Acid Sulfate Soils Field pH Test	Brisbane	Nov 19, 2018	7 Days
- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests			
% Moisture	Melbourne	Nov 19, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: Cardno (NSW/ACT) Pty Ltd
Address: Level 9, 203 Pacific Highway
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NSW 2065

Project Name: KYEEMAGH INFANTS SCHOOL
Project ID: 80818157

Order No.:
Report #: 628416
Phone: 0294967700
Fax: 02 9499 3902

Received: Nov 19, 2018 2:52 PM
Due: Nov 26, 2018
Priority: 5 Day
Contact Name: Ben Withnall

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	HOLD	Acid Sulfate Soils Field pH Test	BTEX	Eurofins | mgt Suite B15	Volatile Organics	TRH (after Silica Gel cleanup)	Moisture Set	Total Recoverable Hydrocarbons	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X				X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X				X					X	X	X
Brisbane Laboratory - NATA Site # 20794									X	X								
Perth Laboratory - NATA Site # 23736																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	TP13_0.1	Nov 17, 2018		Soil	S18-No24227	X						X	X		X		X	
2	TP13_0.4	Nov 17, 2018		Soil	S18-No24228	X												
3	TP14_0.1	Nov 17, 2018		Soil	S18-No24229	X												
4	TP14_0.7	Nov 17, 2018		Soil	S18-No24230										X			X
5	TP15_0.1	Nov 17, 2018		Soil	S18-No24231										X		X	
6	TP15_0.6	Nov 17, 2018		Soil	S18-No24232							X			X			X
7	TP16_0.1	Nov 17, 2018		Soil	S18-No24233										X		X	
8	TP16_0.8	Nov 17, 2018		Soil	S18-No24234										X			X
9	TP17_0.1	Nov 17, 2018		Soil	S18-No24235	X												

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Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	HOLD	Acid Sulfate Soils Field pH Test	BTEX	Eurofins | mgt Suite B15	Volatile Organics	TRH (after Silica Gel cleanup)	Moisture Set	Total Recoverable Hydrocarbons	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X				X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X				X					X	X	X
Brisbane Laboratory - NATA Site # 20794									X	X								
Perth Laboratory - NATA Site # 23736																		
10	TP17_0.5	Nov 17, 2018		Soil	S18-No24236										X			X
11	TP18_0.1	Nov 17, 2018		Soil	S18-No24237	X						X			X		X	
12	TP18_0.4	Nov 17, 2018		Soil	S18-No24238										X			X
13	TP20_0.1	Nov 17, 2018		Soil	S18-No24239	X						X			X		X	
14	QA300	Nov 17, 2018		Soil	S18-No24240										X		X	
15	ASB2	Nov 17, 2018		Building Materials	S18-No24241		X											
16	KYE_TB	Nov 17, 2018		Soil	S18-No24242						X							
17	KYE_TS	Nov 17, 2018		Soil	S18-No24243						X							
18	BH02_0.5	Nov 17, 2018		Soil	S18-No24245	X									X		X	
19	BH2_1.0	Nov 17, 2018		Soil	S18-No24246										X			X
20	BH03_0.5	Nov 17, 2018		Soil	S18-No24247	X									X		X	

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		Phone:	0294967700	**Priority:**	5 Day
		Fax:	02 9499 3902	**Contact Name:**	Ben Withnall
Project Name:	KYEEMAGH INFANTS SCHOOL				
Project ID:	80818157				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	HOLD	Acid Sulfate Soils Field pH Test	BTEX	Eurofins | mgt Suite B15	Volatile Organics	TRH (after Silica Gel cleanup)	Moisture Set	Total Recoverable Hydrocarbons	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X				X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X				X					X	X	X
Brisbane Laboratory - NATA Site # 20794									X	X								
Perth Laboratory - NATA Site # 23736																		
21	BH02_2.0-2.45	Nov 17, 2018		Soil	S18-No24248					X								
22	BH02_4.0-4.45	Nov 17, 2018		Soil	S18-No24249					X								
23	BH02_5.5-5.95	Nov 17, 2018		Soil	S18-No24250					X								
24	BH02_7.0-7.45	Nov 17, 2018		Soil	S18-No24251					X								
25	BH02_8.5-8.95	Nov 17, 2018		Soil	S18-No24252					X								
26	BH02_10.0-10.45	Nov 17, 2018		Soil	S18-No24253					X								
27	BH02_11.5-11.95	Nov 17, 2018		Soil	S18-No24254					X								
28	BH02_13.0-13.45	Nov 17, 2018		Soil	S18-No24255					X								
29	BH02_14.5-14.95	Nov 17, 2018		Soil	S18-No24256					X								

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Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	HOLD	Acid Sulfate Soils Field pH Test	BTEX	Eurofins | mgt Suite B15	Volatile Organics	TRH (after Silica Gel cleanup)	Moisture Set	Total Recoverable Hydrocarbons	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X				X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X				X					X	X	X
Brisbane Laboratory - NATA Site # 20794									X	X								
Perth Laboratory - NATA Site # 23736																		
30	BH02_16.0-16.45	Nov 17, 2018		Soil	S18-No24257					X								
31	BH02_17.5-17.95	Nov 17, 2018		Soil	S18-No24258					X								
32	BH03_1.0-1.1	Nov 17, 2018		Soil	S18-No24259					X								
33	BH03_2.5-2.95	Nov 17, 2018		Soil	S18-No24260					X								
34	BH03_4.0-4.45	Nov 17, 2018		Soil	S18-No24261					X								
35	BH03_5.5-5.95	Nov 17, 2018		Soil	S18-No24262					X								
36	BH03_7.0-7.45	Nov 17, 2018		Soil	S18-No24263					X								
37	BH03_8.5-8.95	Nov 17, 2018		Soil	S18-No24264					X								
38	BH03_10.0-10.45	Nov 17, 2018		Soil	S18-No24265					X								
39	BH03_11.5-	Nov 17, 2018		Soil	S18-No24266					X								

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		Phone:	0294967700	**Priority:**	5 Day
		Fax:	02 9499 3902	**Contact Name:**	Ben Withnall
Project Name:	KYEEMAGH INFANTS SCHOOL				
Project ID:	80818157				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	HOLD	Acid Sulfate Soils Field pH Test	BTEX	Eurofins | mgt Suite B15	Volatile Organics	TRH (after Silica Gel cleanup)	Moisture Set	Total Recoverable Hydrocarbons	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X				X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X				X					X	X	X
Brisbane Laboratory - NATA Site # 20794									X	X								
Perth Laboratory - NATA Site # 23736																		
	11.95																	
40	BH03_13.0-13.45	Nov 17, 2018		Soil	S18-No24267					X								
41	TP20_0.4	Nov 17, 2018		Soil	S18-No24268			X										
42	KYE_GUM	Nov 17, 2018		Water	S18-No24269									X		X		
43	BH02_2.0	Nov 17, 2018		Soil	S18-No24270				X									
44	KYE_RIN	Nov 17, 2018		Water	S18-No24271													X
Test Counts						8	1	2	2	20	2	4	1	1	14	1	8	7

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ug/L:** micrograms per litre
ppm: Parts per million	**ppb:** Parts per billion	**%:** Percentage
org/100mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dibromoethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.4-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.3.5-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
2-Butanone (MEK)	mg/kg	< 0.5			0.5	Pass	
2-Propanone (Acetone)	mg/kg	< 0.5			0.5	Pass	
4-Chlorotoluene	mg/kg	< 0.5			0.5	Pass	
4-Methyl-2-pentanone (MIBK)	mg/kg	< 0.5			0.5	Pass	
Allyl chloride	mg/kg	< 0.5			0.5	Pass	
Benzene	mg/kg	< 0.1			0.1	Pass	
Bromobenzene	mg/kg	< 0.5			0.5	Pass	
Bromochloromethane	mg/kg	< 0.5			0.5	Pass	
Bromodichloromethane	mg/kg	< 0.5			0.5	Pass	
Bromoform	mg/kg	< 0.5			0.5	Pass	
Bromomethane	mg/kg	< 0.5			0.5	Pass	
Carbon disulfide	mg/kg	< 0.5			0.5	Pass	
Carbon Tetrachloride	mg/kg	< 0.5			0.5	Pass	
Chlorobenzene	mg/kg	< 0.5			0.5	Pass	
Chloroethane	mg/kg	< 0.5			0.5	Pass	
Chloroform	mg/kg	< 0.5			0.5	Pass	
Chloromethane	mg/kg	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
cis-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Dibromochloromethane	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dibromomethane	mg/kg	< 0.5			0.5	Pass	
Dichlorodifluoromethane	mg/kg	< 0.5			0.5	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
Iodomethane	mg/kg	< 0.5			0.5	Pass	
Isopropyl benzene (Cumene)	mg/kg	< 0.5			0.5	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
Methylene Chloride	mg/kg	< 0.5			0.5	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Styrene	mg/kg	< 0.5			0.5	Pass	
Tetrachloroethene	mg/kg	< 0.5			0.5	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
trans-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
trans-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Trichloroethene	mg/kg	< 0.5			0.5	Pass	
Trichlorofluoromethane	mg/kg	< 0.5			0.5	Pass	
Vinyl chloride	mg/kg	< 0.5			0.5	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	75			70-130	Pass	
TRH C10-C14	%	79			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	85			70-130	Pass	
Toluene	%	83			70-130	Pass	
Ethylbenzene	%	78			70-130	Pass	
m&p-Xylenes	%	82			70-130	Pass	
o-Xylene	%	81			70-130	Pass	
Xylenes - Total	%	82			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	77			70-130	Pass	
1.1.1-Trichloroethane	%	117			70-130	Pass	
1.2-Dichlorobenzene	%	104			70-130	Pass	
1.2-Dichloroethane	%	116			70-130	Pass	
Trichloroethene	%	105			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	86			70-130	Pass	
TRH C6-C10	%	103			70-130	Pass	
TRH >C10-C16	%	78			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	103			70-130	Pass	
Acenaphthylene	%	113			70-130	Pass	
Anthracene	%	108			70-130	Pass	
Benz(a)anthracene	%	105			70-130	Pass	
Benzo(a)pyrene	%	91			70-130	Pass	
Benzo(b&j)fluoranthene	%	118			70-130	Pass	
Benzo(g.h.i)perylene	%	108			70-130	Pass	
Benzo(k)fluoranthene	%	99			70-130	Pass	
Chrysene	%	101			70-130	Pass	
Dibenz(a.h)anthracene	%	107			70-130	Pass	
Fluoranthene	%	100			70-130	Pass	
Fluorene	%	111			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	104			70-130	Pass	
Naphthalene	%	103			70-130	Pass	
Phenanthrene	%	109			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Pyrene	%	97			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	118			70-130	Pass	
4.4'-DDE	%	120			70-130	Pass	
4.4'-DDT	%	77			70-130	Pass	
a-BHC	%	96			70-130	Pass	
Aldrin	%	111			70-130	Pass	
b-BHC	%	107			70-130	Pass	
d-BHC	%	106			70-130	Pass	
Dieldrin	%	108			70-130	Pass	
Endosulfan I	%	109			70-130	Pass	
Endosulfan II	%	97			70-130	Pass	
Endosulfan sulphate	%	91			70-130	Pass	
Endrin	%	104			70-130	Pass	
Endrin aldehyde	%	103			70-130	Pass	
Endrin ketone	%	96			70-130	Pass	
g-BHC (Lindane)	%	104			70-130	Pass	
Heptachlor	%	104			70-130	Pass	
Heptachlor epoxide	%	109			70-130	Pass	
Hexachlorobenzene	%	90			70-130	Pass	
Methoxychlor	%	83			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	80			70-130	Pass	
Dimethoate	%	94			70-130	Pass	
Ethion	%	118			70-130	Pass	
Fenitrothion	%	88			70-130	Pass	
Methyl parathion	%	98			70-130	Pass	
Mevinphos	%	88			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	114			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	105			80-120	Pass	
Cadmium	%	103			80-120	Pass	
Chromium	%	109			80-120	Pass	
Copper	%	112			80-120	Pass	
Lead	%	106			80-120	Pass	
Mercury	%	87			75-125	Pass	
Nickel	%	109			80-120	Pass	
Zinc	%	104			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S18-No21893	NCP	%	100			70-130	Pass	
Acenaphthylene	S18-No21893	NCP	%	106			70-130	Pass	
Anthracene	S18-No21893	NCP	%	101			70-130	Pass	
Benz(a)anthracene	S18-No21893	NCP	%	115			70-130	Pass	
Benzo(a)pyrene	S18-No21893	NCP	%	97			70-130	Pass	
Benzo(b&j)fluoranthene	S18-No21893	NCP	%	110			70-130	Pass	
Benzo(g.h.i)perylene	S18-No21893	NCP	%	114			70-130	Pass	
Benzo(k)fluoranthene	S18-No21893	NCP	%	110			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chrysene	S18-No21893	NCP	%	110			70-130	Pass	
Dibenz(a.h)anthracene	S18-No21893	NCP	%	119			70-130	Pass	
Fluoranthene	S18-No21893	NCP	%	104			70-130	Pass	
Fluorene	S18-No21893	NCP	%	108			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S18-No21893	NCP	%	113			70-130	Pass	
Naphthalene	S18-No21893	NCP	%	101			70-130	Pass	
Phenanthrene	S18-No21893	NCP	%	102			70-130	Pass	
Pyrene	S18-No21893	NCP	%	105			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	M18-No24980	NCP	%	100			70-130	Pass	
4.4'-DDE	M18-No24980	NCP	%	113			70-130	Pass	
4.4'-DDT	M18-No24980	NCP	%	130			70-130	Pass	
a-BHC	M18-No24980	NCP	%	88			70-130	Pass	
Aldrin	M18-No24980	NCP	%	100			70-130	Pass	
b-BHC	M18-No24980	NCP	%	97			70-130	Pass	
d-BHC	M18-No24980	NCP	%	102			70-130	Pass	
Dieldrin	M18-No24980	NCP	%	98			70-130	Pass	
Endosulfan I	M18-No24980	NCP	%	99			70-130	Pass	
Endosulfan II	M18-No24980	NCP	%	93			70-130	Pass	
Endosulfan sulphate	M18-No24980	NCP	%	101			70-130	Pass	
Endrin	M18-No24980	NCP	%	110			70-130	Pass	
Endrin aldehyde	M18-No24980	NCP	%	103			70-130	Pass	
Endrin ketone	M18-No24980	NCP	%	105			70-130	Pass	
g-BHC (Lindane)	M18-No24980	NCP	%	96			70-130	Pass	
Heptachlor	M18-No24980	NCP	%	113			70-130	Pass	
Heptachlor epoxide	M18-No24980	NCP	%	98			70-130	Pass	
Hexachlorobenzene	M18-No24980	NCP	%	82			70-130	Pass	
Methoxychlor	M18-No24980	NCP	%	127			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	M18-No28383	NCP	%	95			70-130	Pass	
Dimethoate	M18-No28383	NCP	%	78			70-130	Pass	
Ethion	M18-No28383	NCP	%	122			70-130	Pass	
Fenitrothion	M18-No28383	NCP	%	79			70-130	Pass	
Methyl parathion	M18-No28383	NCP	%	72			70-130	Pass	
Mevinphos	M18-No28383	NCP	%	88			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	M18-No23231	NCP	%	75			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S18-No24236	CP	%	114			70-130	Pass	
TRH C10-C14	S18-No24236	CP	%	106			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S18-No24236	CP	%	101			70-130	Pass	
Toluene	S18-No24236	CP	%	108			70-130	Pass	
Ethylbenzene	S18-No24236	CP	%	119			70-130	Pass	
m&p-Xylenes	S18-No24236	CP	%	113			70-130	Pass	
o-Xylene	S18-No24236	CP	%	112			70-130	Pass	
Xylenes - Total	S18-No24236	CP	%	113			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1.1-Dichloroethene	S18-No24236	CP	%	83			70-130	Pass	
1.1.1-Trichloroethane	S18-No24236	CP	%	99			70-130	Pass	
1.2-Dichlorobenzene	S18-No24236	CP	%	113			70-130	Pass	
1.2-Dichloroethane	S18-No24236	CP	%	98			70-130	Pass	
Trichloroethene	S18-No24236	CP	%	98			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S18-No24236	CP	%	94			70-130	Pass	
TRH C6-C10	S18-No24236	CP	%	108			70-130	Pass	
TRH >C10-C16	S18-No24236	CP	%	104			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S18-No24236	CP	%	113			75-125	Pass	
Cadmium	S18-No24236	CP	%	112			75-125	Pass	
Chromium	S18-No24236	CP	%	117			75-125	Pass	
Copper	S18-No24236	CP	%	122			75-125	Pass	
Lead	S18-No24236	CP	%	113			75-125	Pass	
Mercury	S18-No24236	CP	%	91			70-130	Pass	
Nickel	S18-No24236	CP	%	118			75-125	Pass	
Zinc	S18-No24236	CP	%	110			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	Z18-No25216	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	Z18-No25216	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	Z18-No25216	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	Z18-No25216	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	Z18-No25216	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	Z18-No25216	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	Z18-No25216	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	Z18-No25216	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	Z18-No25216	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	Z18-No25216	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	Z18-No25216	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	Z18-No25216	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	Z18-No25216	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	Z18-No25216	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	Z18-No25216	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	Z18-No25216	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	Z18-No25216	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	Z18-No25216	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	Z18-No25216	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	Z18-No25216	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	Z18-No25216	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	Z18-No25216	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	Z18-No25216	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	Z18-No25216	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	Z18-No25216	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	Z18-No25216	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	Z18-No25216	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	Z18-No25216	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	Z18-No25216	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S18-No24369	NCP	%	7.8	8.5	8.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S18-No24234	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S18-No24234	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S18-No24234	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S18-No24234	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-No24234	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S18-No24234	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S18-No24234	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S18-No24234	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S18-No24234	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1-Dichloroethene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1-Trichloroethane	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2-Trichloroethane	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dibromoethane	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichlorobenzene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloroethane	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloropropane	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.3-Trichloropropane	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4-Trimethylbenzene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichlorobenzene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichloropropane	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3.5-Trimethylbenzene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.4-Dichlorobenzene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Butanone (MEK)	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Propanone (Acetone)	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chlorotoluene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Allyl chloride	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromobenzene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromochloromethane	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromodichloromethane	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromoform	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromomethane	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon disulfide	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon Tetrachloride	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chlorobenzene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroethane	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroform	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloromethane	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.2-Dichloroethene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.3-Dichloropropene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromochloromethane	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromomethane	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorodifluoromethane	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
Iodomethane	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Isopropyl benzene (Cumene)	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Methylene Chloride	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Styrene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Tetrachloroethene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.2-Dichloroethene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.3-Dichloropropene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichloroethene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichlorofluoromethane	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Vinyl chloride	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S18-No24234	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S18-No24234	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S18-No24234	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S18-No24234	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S18-No24234	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S18-No24234	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Fensulfothion	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S18-No24234	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S18-No24234	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S18-No24234	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S18-No24234	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	S18-No24234	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S18-No24234	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Copper	S18-No24234	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	S18-No24234	CP	mg/kg	5.1	< 5	12	30%	Pass	
Mercury	S18-No24234	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S18-No24234	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S18-No24234	CP	mg/kg	8.3	7.4	12	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S18-No24236	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	S18-No24236	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S18-No24236	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Copper	S18-No24236	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	S18-No24236	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Mercury	S18-No24236	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S18-No24236	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S18-No24236	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	S18-No24248	CP	pH Units	7.8	7.8	pass	30%	Pass	
Reaction Ratings*	S18-No24248	CP	comment	1.0	1.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	S18-No24257	CP	pH Units	6.9	7.0	pass	30%	Pass	
Reaction Ratings*	S18-No24257	CP	comment	4.0	4.0	pass	30%	Pass	

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
R20	This sample is a Trip Spike and therefore all results are reported as a percentage
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Nibha Vaidya	Analytical Services Manager
Chris Bennett	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Myles Clark	Senior Analyst-SPOCAS (QLD)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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eurofins | mgt

Testing For Life 30 years 1987–2017
Celebrating 30 years Testing and Protecting Human Health

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Cardno (NSW/ACT) Pty Ltd
Level 9, 203 Pacific Highway
St Leonards
NSW 2065

Attention:	Ben Withnall
Report	628416-AID
Project Name	KYEEMAGH INFANTS SCHOOL
Project ID	80818157
Received Date	Nov 19, 2018
Date Reported	Nov 27, 2018

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name	KYEEMAGH INFANTS SCHOOL
Project ID	80818157
Date Sampled	Nov 17, 2018
Report	628416-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
TP13_0.1	18-No24227	Nov 17, 2018	Approximate Sample 958g Sample consisted of: Grey fine-grained sandy soil	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP13_0.4	18-No24228	Nov 17, 2018	Approximate Sample 810g Sample consisted of: Grey fine-grained sandy soil and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP14_0.1	18-No24229	Nov 17, 2018	Approximate Sample 729g Sample consisted of: Grey fine-grained sandy soil and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP17_0.1	18-No24235	Nov 17, 2018	Approximate Sample 705g Sample consisted of: Grey fine-grained sandy soil and organic debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP18_0.1	18-No24237	Nov 17, 2018	Approximate Sample 686g Sample consisted of: Grey fine-grained sandy soil	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP20_0.1	18-No24239	Nov 17, 2018	Approximate Sample 727g Sample consisted of: Grey fine-grained sandy soil	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
ASB2	18-No24241	Nov 17, 2018	Approximate Sample 22g / 90x40x5mm Sample consisted of: Grey fibre cement fragments	Chrysotile, amosite and crocidolite asbestos detected.
BH02_0.5	18-No24245	Nov 17, 2018	Approximate Sample 553g Sample consisted of: Grey fine-grained sandy soil	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
BH03_0.5	18-No24247	Nov 17, 2018	Approximate Sample 383g Sample consisted of: Brown fine-grained sandy soil	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Nov 19, 2018	Indefinite
Asbestos - LTM-ASB-8020	Sydney	Nov 19, 2018	Indefinite

Company Name: Cardno (NSW/ACT) Pty Ltd
Address: Level 9, 203 Pacific Highway
St Leonards
NSW 2065

Project Name: KYEEMAGH INFANTS SCHOOL
Project ID: 80818157

Order No.:
Report #: 628416
Phone: 0294967700
Fax: 02 9499 3902

Received: Nov 19, 2018 2:52 PM
Due: Nov 26, 2018
Priority: 5 Day
Contact Name: Ben Withnall

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	HOLD	Acid Sulfate Soils Field pH Test	BTEX	Eurofins | mgt Suite B15	Volatile Organics	TRH (after Silica Gel cleanup)	Moisture Set	Total Recoverable Hydrocarbons	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X				X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X				X					X	X	X
Brisbane Laboratory - NATA Site # 20794									X	X								
Perth Laboratory - NATA Site # 23736																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	TP13_0.1	Nov 17, 2018		Soil	S18-No24227	X						X	X		X		X	
2	TP13_0.4	Nov 17, 2018		Soil	S18-No24228	X												
3	TP14_0.1	Nov 17, 2018		Soil	S18-No24229	X												
4	TP14_0.7	Nov 17, 2018		Soil	S18-No24230										X			X
5	TP15_0.1	Nov 17, 2018		Soil	S18-No24231										X		X	
6	TP15_0.6	Nov 17, 2018		Soil	S18-No24232							X			X			X
7	TP16_0.1	Nov 17, 2018		Soil	S18-No24233										X		X	
8	TP16_0.8	Nov 17, 2018		Soil	S18-No24234										X			X
9	TP17_0.1	Nov 17, 2018		Soil	S18-No24235	X												

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Melbourne Laboratory - NATA Site # 1254 & 14271								X				X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X				X					X	X	X
Brisbane Laboratory - NATA Site # 20794									X	X								
Perth Laboratory - NATA Site # 23736																		
10	TP17_0.5	Nov 17, 2018		Soil	S18-No24236										X			X
11	TP18_0.1	Nov 17, 2018		Soil	S18-No24237	X						X			X		X	
12	TP18_0.4	Nov 17, 2018		Soil	S18-No24238										X			X
13	TP20_0.1	Nov 17, 2018		Soil	S18-No24239	X						X			X		X	
14	QA300	Nov 17, 2018		Soil	S18-No24240										X		X	
15	ASB2	Nov 17, 2018		Building Materials	S18-No24241		X											
16	KYE_TB	Nov 17, 2018		Soil	S18-No24242						X							
17	KYE_TS	Nov 17, 2018		Soil	S18-No24243						X							
18	BH02_0.5	Nov 17, 2018		Soil	S18-No24245	X									X		X	
19	BH2_1.0	Nov 17, 2018		Soil	S18-No24246										X			X
20	BH03_0.5	Nov 17, 2018		Soil	S18-No24247	X									X		X	

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Project Name: KYEEMAGH INFANTS SCHOOL
Project ID: 80818157

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	HOLD	Acid Sulfate Soils Field pH Test	BTEX	Eurofins | mgt Suite B15	Volatile Organics	TRH (after Silica Gel cleanup)	Moisture Set	Total Recoverable Hydrocarbons	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X				X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X				X					X	X	X
Brisbane Laboratory - NATA Site # 20794									X	X								
Perth Laboratory - NATA Site # 23736																		
21	BH02_2.0-2.45	Nov 17, 2018		Soil	S18-No24248					X								
22	BH02_4.0-4.45	Nov 17, 2018		Soil	S18-No24249					X								
23	BH02_5.5-5.95	Nov 17, 2018		Soil	S18-No24250					X								
24	BH02_7.0-7.45	Nov 17, 2018		Soil	S18-No24251					X								
25	BH02_8.5-8.95	Nov 17, 2018		Soil	S18-No24252					X								
26	BH02_10.0-10.45	Nov 17, 2018		Soil	S18-No24253					X								
27	BH02_11.5-11.95	Nov 17, 2018		Soil	S18-No24254					X								
28	BH02_13.0-13.45	Nov 17, 2018		Soil	S18-No24255					X								
29	BH02_14.5-14.95	Nov 17, 2018		Soil	S18-No24256					X								

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Project Name: KYEEMAGH INFANTS SCHOOL
Project ID: 80818157

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	HOLD	Acid Sulfate Soils Field pH Test	BTEX	Eurofins | mgt Suite B15	Volatile Organics	TRH (after Silica Gel cleanup)	Moisture Set	Total Recoverable Hydrocarbons	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X				X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X				X					X	X	X
Brisbane Laboratory - NATA Site # 20794									X	X								
Perth Laboratory - NATA Site # 23736																		
30	BH02_16.0-16.45	Nov 17, 2018		Soil	S18-No24257					X								
31	BH02_17.5-17.95	Nov 17, 2018		Soil	S18-No24258					X								
32	BH03_1.0-1.1	Nov 17, 2018		Soil	S18-No24259					X								
33	BH03_2.5-2.95	Nov 17, 2018		Soil	S18-No24260					X								
34	BH03_4.0-4.45	Nov 17, 2018		Soil	S18-No24261					X								
35	BH03_5.5-5.95	Nov 17, 2018		Soil	S18-No24262					X								
36	BH03_7.0-7.45	Nov 17, 2018		Soil	S18-No24263					X								
37	BH03_8.5-8.95	Nov 17, 2018		Soil	S18-No24264					X								
38	BH03_10.0-10.45	Nov 17, 2018		Soil	S18-No24265					X								
39	BH03_11.5-	Nov 17, 2018		Soil	S18-No24266					X								

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Contact Name: Ben Withnall

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	HOLD	Acid Sulfate Soils Field pH Test	BTEX	Eurofins | mgt Suite B15	Volatile Organics	TRH (after Silica Gel cleanup)	Moisture Set	Total Recoverable Hydrocarbons	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X				X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X				X					X	X	X
Brisbane Laboratory - NATA Site # 20794									X	X								
Perth Laboratory - NATA Site # 23736																		
	11.95																	
40	BH03_13.0-13.45	Nov 17, 2018		Soil	S18-No24267					X								
41	TP20_0.4	Nov 17, 2018		Soil	S18-No24268			X										
42	KYE_GUM	Nov 17, 2018		Water	S18-No24269									X		X		
43	BH02_2.0	Nov 17, 2018		Soil	S18-No24270				X									
44	KYE_RIN	Nov 17, 2018		Water	S18-No24271													X
Test Counts						8	1	2	2	20	2	4	1	1	14	1	8	7

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

No24247: Sample received was less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Authorised by:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Cardno (NSW/ACT) Pty Ltd
Level 9, 203 Pacific Highway
St Leonards
NSW 2065

Attention: **Ben Withnall**

Report **628416-W**
Project name KYEEMAGH INFANTS SCHOOL
Project ID 80818157
Received Date Nov 19, 2018

Client Sample ID			**KYE_GUM**	**KYE_RIN**
Sample Matrix			**Water**	**Water**
Eurofins | mgt Sample No.			**S18-No24269**	**S18-No24271**
Date Sampled			**Nov 17, 2018**	**Nov 17, 2018**
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1	< 0.1
Volatile Organics				
1.1-Dichloroethane	0.001	mg/L	-	< 0.001
1.1-Dichloroethene	0.001	mg/L	-	< 0.001
1.1.1-Trichloroethane	0.001	mg/L	-	< 0.001
1.1.1.2-Tetrachloroethane	0.001	mg/L	-	< 0.001
1.1.2-Trichloroethane	0.001	mg/L	-	< 0.001
1.1.2.2-Tetrachloroethane	0.001	mg/L	-	< 0.001
1.2-Dibromoethane	0.001	mg/L	-	< 0.001
1.2-Dichlorobenzene	0.001	mg/L	-	< 0.001
1.2-Dichloroethane	0.001	mg/L	-	< 0.001
1.2-Dichloropropane	0.001	mg/L	-	< 0.001
1.2.3-Trichloropropane	0.001	mg/L	-	< 0.001
1.2.4-Trimethylbenzene	0.001	mg/L	-	< 0.001
1.3-Dichlorobenzene	0.001	mg/L	-	< 0.001
1.3-Dichloropropane	0.001	mg/L	-	< 0.001
1.3.5-Trimethylbenzene	0.001	mg/L	-	< 0.001
1.4-Dichlorobenzene	0.001	mg/L	-	< 0.001
2-Butanone (MEK)	0.001	mg/L	-	< 0.001
2-Propanone (Acetone)	0.001	mg/L	-	< 0.001
4-Chlorotoluene	0.001	mg/L	-	< 0.001
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	-	< 0.001
Allyl chloride	0.001	mg/L	-	< 0.001
Benzene	0.001	mg/L	-	< 0.001
Bromobenzene	0.001	mg/L	-	< 0.001
Bromochloromethane	0.001	mg/L	-	< 0.001
Bromodichloromethane	0.001	mg/L	-	< 0.001
Bromoform	0.001	mg/L	-	< 0.001
Bromomethane	0.001	mg/L	-	< 0.001
Carbon disulfide	0.001	mg/L	-	< 0.001
Carbon Tetrachloride	0.001	mg/L	-	< 0.001

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**KYE_GUM** **Water** **S18-No24269** **Nov 17, 2018**	**KYE_RIN** **Water** **S18-No24271** **Nov 17, 2018**
Volatile Organics				
Chlorobenzene	0.001	mg/L	-	< 0.001
Chloroethane	0.001	mg/L	-	< 0.001
Chloroform	0.005	mg/L	-	< 0.005
Chloromethane	0.001	mg/L	-	< 0.001
cis-1.2-Dichloroethene	0.001	mg/L	-	< 0.001
cis-1.3-Dichloropropene	0.001	mg/L	-	< 0.001
Dibromochloromethane	0.001	mg/L	-	< 0.001
Dibromomethane	0.001	mg/L	-	< 0.001
Dichlorodifluoromethane	0.001	mg/L	-	< 0.001
Ethylbenzene	0.001	mg/L	-	< 0.001
Iodomethane	0.001	mg/L	-	< 0.001
Isopropyl benzene (Cumene)	0.001	mg/L	-	< 0.001
m&p-Xylenes	0.002	mg/L	-	< 0.002
Methylene Chloride	0.001	mg/L	-	< 0.001
o-Xylene	0.001	mg/L	-	< 0.001
Styrene	0.001	mg/L	-	< 0.001
Tetrachloroethene	0.001	mg/L	-	< 0.001
Toluene	0.001	mg/L	-	< 0.001
trans-1.2-Dichloroethene	0.001	mg/L	-	< 0.001
trans-1.3-Dichloropropene	0.001	mg/L	-	< 0.001
Trichloroethene	0.001	mg/L	-	< 0.001
Trichlorofluoromethane	0.001	mg/L	-	< 0.001
Vinyl chloride	0.001	mg/L	-	< 0.001
Xylenes - Total	0.003	mg/L	-	< 0.003
Total MAH*	0.003	mg/L	-	< 0.003
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	-	< 0.005
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	-	< 0.005
4-Bromofluorobenzene (surr.)	1	%	-	109
Toluene-d8 (surr.)	1	%	-	115
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene^{N02}	0.01	mg/L	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)^{N04}	0.02	mg/L	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2)^{N01}	0.05	mg/L	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1
Polycyclic Aromatic Hydrocarbons				
Acenaphthene	0.001	mg/L	-	< 0.001
Acenaphthylene	0.001	mg/L	-	< 0.001
Anthracene	0.001	mg/L	-	< 0.001
Benz(a)anthracene	0.001	mg/L	-	< 0.001
Benzo(a)pyrene	0.001	mg/L	-	< 0.001
Benzo(b&j)fluoranthene^{N07}	0.001	mg/L	-	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	-	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	-	< 0.001
Chrysene	0.001	mg/L	-	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	-	< 0.001

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**KYE_GUM** **Water** **S18-No24269** **Nov 17, 2018**	**KYE_RIN** **Water** **S18-No24271** **Nov 17, 2018**
Polycyclic Aromatic Hydrocarbons				
Fluoranthene	0.001	mg/L	-	< 0.001
Fluorene	0.001	mg/L	-	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	-	< 0.001
Naphthalene	0.001	mg/L	-	< 0.001
Phenanthrene	0.001	mg/L	-	< 0.001
Pyrene	0.001	mg/L	-	< 0.001
Total PAH*	0.001	mg/L	-	< 0.001
2-Fluorobiphenyl (surr.)	1	%	-	79
p-Terphenyl-d14 (surr.)	1	%	-	55
TRH - 2013 NEPM Fractions (after silica gel clean-up)				
TRH >C10-C16 (after silica gel clean-up)	0.05	mg/L	< 0.05	-
TRH >C16-C34 (after silica gel clean-up)	0.1	mg/L	< 0.1	-
TRH >C34-C40 (after silica gel clean-up)	0.1	mg/L	< 0.1	-
TRH - 1999 NEPM Fractions (after silica gel clean-up)				
TRH C10-C36 (Total) (after silica gel clean-up)	0.1	mg/L	< 0.1	-
TRH C10-C14 (after silica gel clean-up)	0.05	mg/L	< 0.05	-
TRH C15-C28 (after silica gel clean-up)	0.1	mg/L	< 0.1	-
TRH C29-C36 (after silica gel clean-up)	0.1	mg/L	< 0.1	-
Heavy Metals				
Arsenic	0.001	mg/L	-	< 0.001
Cadmium	0.0002	mg/L	-	< 0.0002
Chromium	0.001	mg/L	-	< 0.001
Copper	0.001	mg/L	-	< 0.001
Lead	0.001	mg/L	-	< 0.001
Mercury	0.0001	mg/L	-	< 0.0001
Nickel	0.001	mg/L	-	< 0.001
Zinc	0.005	mg/L	-	< 0.005

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B8			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Nov 21, 2018	7 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Volatile Organics	Melbourne	Nov 21, 2018	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Nov 21, 2018	7 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Nov 21, 2018	7 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Melbourne	Nov 21, 2018	7 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Melbourne	Nov 21, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
TRH - 2013 NEPM Fractions (after silica gel clean-up)	Melbourne	Nov 26, 2018	7 Day
- Method: LTM-ORG-2010 TRH C6-C40			
TRH - 1999 NEPM Fractions (after silica gel clean-up)	Melbourne	Nov 26, 2018	7 Day
- Method: TRH C6-C36 (Silica Gel Cleanup) - MGT 100A			

Company Name: Cardno (NSW/ACT) Pty Ltd
Address: Level 9, 203 Pacific Highway
St Leonards
NSW 2065

Order No.:
Report #: 628416
Phone: 0294967700
Fax: 02 9499 3902

Received: Nov 19, 2018 2:52 PM
Due: Nov 26, 2018
Priority: 5 Day
Contact Name: Ben Withnall

Project Name: KYEEMAGH INFANTS SCHOOL
Project ID: 80818157

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	HOLD	Acid Sulfate Soils Field pH Test	BTEX	Eurofins | mgt Suite B15	Volatile Organics	TRH (after Silica Gel cleanup)	Moisture Set	Total Recoverable Hydrocarbons	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X				X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X				X					X	X	X
Brisbane Laboratory - NATA Site # 20794									X	X								
Perth Laboratory - NATA Site # 23736																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	TP13_0.1	Nov 17, 2018		Soil	S18-No24227	X						X	X		X		X	
2	TP13_0.4	Nov 17, 2018		Soil	S18-No24228	X												
3	TP14_0.1	Nov 17, 2018		Soil	S18-No24229	X												
4	TP14_0.7	Nov 17, 2018		Soil	S18-No24230										X			X
5	TP15_0.1	Nov 17, 2018		Soil	S18-No24231										X		X	
6	TP15_0.6	Nov 17, 2018		Soil	S18-No24232							X			X			X
7	TP16_0.1	Nov 17, 2018		Soil	S18-No24233										X		X	
8	TP16_0.8	Nov 17, 2018		Soil	S18-No24234										X			X
9	TP17_0.1	Nov 17, 2018		Soil	S18-No24235	X												

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Project ID:	80818157				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	HOLD	Acid Sulfate Soils Field pH Test	BTEX	Eurofins | mgt Suite B15	Volatile Organics	TRH (after Silica Gel cleanup)	Moisture Set	Total Recoverable Hydrocarbons	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X				X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X				X					X	X	X
Brisbane Laboratory - NATA Site # 20794									X	X								
Perth Laboratory - NATA Site # 23736																		
10	TP17_0.5	Nov 17, 2018		Soil	S18-No24236										X			X
11	TP18_0.1	Nov 17, 2018		Soil	S18-No24237	X						X			X		X	
12	TP18_0.4	Nov 17, 2018		Soil	S18-No24238										X			X
13	TP20_0.1	Nov 17, 2018		Soil	S18-No24239	X						X			X		X	
14	QA300	Nov 17, 2018		Soil	S18-No24240										X		X	
15	ASB2	Nov 17, 2018		Building Materials	S18-No24241		X											
16	KYE_TB	Nov 17, 2018		Soil	S18-No24242						X							
17	KYE_TS	Nov 17, 2018		Soil	S18-No24243						X							
18	BH02_0.5	Nov 17, 2018		Soil	S18-No24245	X									X		X	
19	BH2_1.0	Nov 17, 2018		Soil	S18-No24246										X			X
20	BH03_0.5	Nov 17, 2018		Soil	S18-No24247	X									X		X	

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Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	HOLD	Acid Sulfate Soils Field pH Test	BTEX	Eurofins | mgt Suite B15	Volatile Organics	TRH (after Silica Gel cleanup)	Moisture Set	Total Recoverable Hydrocarbons	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X				X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X				X					X	X	X
Brisbane Laboratory - NATA Site # 20794									X	X								
Perth Laboratory - NATA Site # 23736																		
21	BH02_2.0-2.45	Nov 17, 2018		Soil	S18-No24248					X								
22	BH02_4.0-4.45	Nov 17, 2018		Soil	S18-No24249					X								
23	BH02_5.5-5.95	Nov 17, 2018		Soil	S18-No24250					X								
24	BH02_7.0-7.45	Nov 17, 2018		Soil	S18-No24251					X								
25	BH02_8.5-8.95	Nov 17, 2018		Soil	S18-No24252					X								
26	BH02_10.0-10.45	Nov 17, 2018		Soil	S18-No24253					X								
27	BH02_11.5-11.95	Nov 17, 2018		Soil	S18-No24254					X								
28	BH02_13.0-13.45	Nov 17, 2018		Soil	S18-No24255					X								
29	BH02_14.5-14.95	Nov 17, 2018		Soil	S18-No24256					X								

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Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	HOLD	Acid Sulfate Soils Field pH Test	BTEX	Eurofins | mgt Suite B15	Volatile Organics	TRH (after Silica Gel cleanup)	Moisture Set	Total Recoverable Hydrocarbons	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X				X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X				X					X	X	X
Brisbane Laboratory - NATA Site # 20794									X	X								
Perth Laboratory - NATA Site # 23736																		
30	BH02_16.0-16.45	Nov 17, 2018		Soil	S18-No24257					X								
31	BH02_17.5-17.95	Nov 17, 2018		Soil	S18-No24258					X								
32	BH03_1.0-1.1	Nov 17, 2018		Soil	S18-No24259					X								
33	BH03_2.5-2.95	Nov 17, 2018		Soil	S18-No24260					X								
34	BH03_4.0-4.45	Nov 17, 2018		Soil	S18-No24261					X								
35	BH03_5.5-5.95	Nov 17, 2018		Soil	S18-No24262					X								
36	BH03_7.0-7.45	Nov 17, 2018		Soil	S18-No24263					X								
37	BH03_8.5-8.95	Nov 17, 2018		Soil	S18-No24264					X								
38	BH03_10.0-10.45	Nov 17, 2018		Soil	S18-No24265					X								
39	BH03_11.5-	Nov 17, 2018		Soil	S18-No24266					X								

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Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	HOLD	Acid Sulfate Soils Field pH Test	BTEX	Eurofins | mgt Suite B15	Volatile Organics	TRH (after Silica Gel cleanup)	Moisture Set	Total Recoverable Hydrocarbons	Eurofins | mgt Suite B7	Eurofins | mgt Suite B8
Melbourne Laboratory - NATA Site # 1254 & 14271								X				X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X				X					X	X	X
Brisbane Laboratory - NATA Site # 20794									X	X								
Perth Laboratory - NATA Site # 23736																		
	11.95																	
40	BH03_13.0-13.45	Nov 17, 2018		Soil	S18-No24267					X								
41	TP20_0.4	Nov 17, 2018		Soil	S18-No24268			X										
42	KYE_GUM	Nov 17, 2018		Water	S18-No24269									X		X		
43	BH02_2.0	Nov 17, 2018		Soil	S18-No24270				X									
44	KYE_RIN	Nov 17, 2018		Water	S18-No24271													X
Test Counts						8	1	2	2	20	2	4	1	1	14	1	8	7

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ug/L:** micrograms per litre
ppm: Parts per million	**ppb:** Parts per billion	**%:** Percentage
org/100mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
1.1.1-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.1.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dibromoethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.2-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.3-Trichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.4-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.3.5-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.4-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
2-Butanone (MEK)	mg/L	< 0.001			0.001	Pass	
2-Propanone (Acetone)	mg/L	< 0.001			0.001	Pass	
4-Chlorotoluene	mg/L	< 0.001			0.001	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.001			0.001	Pass	
Allyl chloride	mg/L	< 0.001			0.001	Pass	
Benzene	mg/L	< 0.001			0.001	Pass	
Bromobenzene	mg/L	< 0.001			0.001	Pass	
Bromochloromethane	mg/L	< 0.001			0.001	Pass	
Bromodichloromethane	mg/L	< 0.001			0.001	Pass	
Bromoform	mg/L	< 0.001			0.001	Pass	
Bromomethane	mg/L	< 0.001			0.001	Pass	
Carbon disulfide	mg/L	< 0.001			0.001	Pass	
Carbon Tetrachloride	mg/L	< 0.001			0.001	Pass	
Chlorobenzene	mg/L	< 0.001			0.001	Pass	
Chloroethane	mg/L	< 0.001			0.001	Pass	
Chloroform	mg/L	< 0.005			0.005	Pass	
Chloromethane	mg/L	< 0.001			0.001	Pass	
cis-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Dibromochloromethane	mg/L	< 0.001			0.001	Pass	
Dibromomethane	mg/L	< 0.001			0.001	Pass	
Dichlorodifluoromethane	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
Methylene Chloride	mg/L	< 0.001			0.001	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Styrene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Trichloroethene	mg/L	< 0.001			0.001	Pass	
Trichlorofluoromethane	mg/L	< 0.001			0.001	Pass	
Vinyl chloride	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	113			70-130	Pass	
TRH C10-C14	%	90			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	85			70-130	Pass	
1.1.1-Trichloroethane	%	93			70-130	Pass	
1.2-Dichlorobenzene	%	104			70-130	Pass	
1.2-Dichloroethane	%	98			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzene	%	94			70-130	Pass	
Ethylbenzene	%	102			70-130	Pass	
m&p-Xylenes	%	101			70-130	Pass	
Toluene	%	102			70-130	Pass	
Trichloroethene	%	87			70-130	Pass	
Xylenes - Total	%	100			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	111			70-130	Pass	
TRH C6-C10	%	118			70-130	Pass	
TRH >C10-C16	%	93			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	90			70-130	Pass	
Acenaphthylene	%	92			70-130	Pass	
Anthracene	%	87			70-130	Pass	
Benz(a)anthracene	%	79			70-130	Pass	
Benzo(a)pyrene	%	93			70-130	Pass	
Benzo(b&j)fluoranthene	%	91			70-130	Pass	
Benzo(g.h.i)perylene	%	101			70-130	Pass	
Benzo(k)fluoranthene	%	107			70-130	Pass	
Chrysene	%	97			70-130	Pass	
Dibenz(a.h)anthracene	%	95			70-130	Pass	
Fluoranthene	%	84			70-130	Pass	
Fluorene	%	95			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	85			70-130	Pass	
Naphthalene	%	91			70-130	Pass	
Phenanthrene	%	87			70-130	Pass	
Pyrene	%	87			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	100			80-120	Pass	
Cadmium	%	96			80-120	Pass	
Chromium	%	100			80-120	Pass	
Copper	%	102			80-120	Pass	
Lead	%	101			80-120	Pass	
Mercury	%	91			75-125	Pass	
Nickel	%	98			80-120	Pass	
Zinc	%	100			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M18-No23495	NCP	%	127			70-130	Pass	
TRH C10-C14	M18-No24798	NCP	%	114			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-No23495	NCP	%	113			70-130	Pass	
TRH C6-C10	M18-No23495	NCP	%	128			70-130	Pass	
TRH >C10-C16	M18-No24798	NCP	%	123			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
1.1-Dichloroethene	M18-No23495	NCP	%	96			70-130	Pass	
1.1.1-Trichloroethane	M18-No23495	NCP	%	99			70-130	Pass	
1.2-Dichlorobenzene	M18-No23495	NCP	%	102			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1.2-Dichloroethane	M18-No23495	NCP	%	98			70-130	Pass	
Benzene	M18-No23495	NCP	%	100			70-130	Pass	
Ethylbenzene	M18-No23495	NCP	%	108			70-130	Pass	
m&p-Xylenes	M18-No23495	NCP	%	106			70-130	Pass	
o-Xylene	M18-No23495	NCP	%	103			70-130	Pass	
Toluene	M18-No23495	NCP	%	112			70-130	Pass	
Trichloroethene	M18-No23495	NCP	%	95			70-130	Pass	
Xylenes - Total	M18-No23495	NCP	%	105			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-No25533	NCP	%	91			70-130	Pass	
Acenaphthylene	M18-No25533	NCP	%	94			70-130	Pass	
Anthracene	M18-No25533	NCP	%	90			70-130	Pass	
Benz(a)anthracene	M18-No25533	NCP	%	86			70-130	Pass	
Benzo(a)pyrene	M18-No25533	NCP	%	92			70-130	Pass	
Benzo(b&j)fluoranthene	M18-No25533	NCP	%	83			70-130	Pass	
Benzo(g.h.i)perylene	M18-No25533	NCP	%	99			70-130	Pass	
Benzo(k)fluoranthene	M18-No25533	NCP	%	97			70-130	Pass	
Chrysene	M18-No25533	NCP	%	103			70-130	Pass	
Dibenz(a.h)anthracene	M18-No25533	NCP	%	90			70-130	Pass	
Fluoranthene	M18-No25533	NCP	%	101			70-130	Pass	
Fluorene	M18-No25533	NCP	%	97			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-No25533	NCP	%	89			70-130	Pass	
Naphthalene	M18-No25533	NCP	%	87			70-130	Pass	
Phenanthrene	M18-No25533	NCP	%	97			70-130	Pass	
Pyrene	M18-No25533	NCP	%	103			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-No30209	NCP	%	101			75-125	Pass	
Cadmium	M18-No30209	NCP	%	98			75-125	Pass	
Chromium	M18-No30209	NCP	%	101			75-125	Pass	
Copper	M18-No30209	NCP	%	104			75-125	Pass	
Lead	M18-No30209	NCP	%	103			75-125	Pass	
Mercury	M18-No30209	NCP	%	89			70-130	Pass	
Nickel	M18-No30209	NCP	%	98			75-125	Pass	
Zinc	M18-No30209	NCP	%	99			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M18-No22029	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M18-No27374	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M18-No27374	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M18-No27374	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-No22029	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M18-No22029	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	M18-No27374	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M18-No27374	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M18-No27374	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
Benzene	M18-No22029	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M18-No22029	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M18-No22029	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M18-No22029	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M18-No22029	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M18-No22029	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M18-No25532	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M18-No25532	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M18-No25532	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M18-No25532	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M18-No25532	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-No25532	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-No25532	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M18-No25532	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	M18-No25532	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	M18-No25532	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	M18-No25532	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M18-No25532	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-No25532	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	M18-No25532	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	M18-No25532	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	M18-No25532	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-No30209	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	M18-No30209	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	M18-No30209	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	M18-No30209	NCP	mg/L	0.019	0.021	7.0	30%	Pass	
Lead	M18-No30209	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	M18-No30209	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	M18-No30209	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	M18-No30209	NCP	mg/L	< 0.005	0.006	53	30%	Fail	Q15

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Nibha Vaidya	Analytical Services Manager
Chris Bennett	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Cardno
Shaping the Future

CHAIN OF CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

Contact Person:	Ben Withnall	**Project Name:**	Kyeemagh Infants School
Telephone Number:	9495 8188	**Project Number:**	80818157
Alternative Contact:	Joel Griffiths	**PO No.:**	
Telephone Number:	9496 7873	**Project Specific Quote No. :**	181029CAR_1
Sampler:	Joel Griffiths	**Date results required:**	Standard TAT
Email Address (results and invoice):	ben.withnall@cardno.com.au; joel.griffiths@cardno.com.au	**Report format:**	Electronic

Address: Level 9 - The Forum, 203 Pacific Highway, St Leonards, New South Wales 2065

Sample information						Analysis Required												Comments
Cardno Sample ID	**Laboratory Sample ID**	**No. Containers**	**Preservation**	**Date sampled**	**Matrix**	B7*1 - TRH/BTEXN/PAH/Metals 8	B15*1 - OCP/OPP/PCB	B8*1 TRH, VOC, PAH, Metals (8)	pH Field Screen (pH and pHfox)	Asbestos (w/w%)	Asbestos Presence / Absence	BTEX	HOLD					
tp13_0.1		2	Ice	17/11/2018	Soil	X	X	X		X								
tp13_0.4		2	Ice	17/11/2018	Soil					X								
tp14_0.1		2	Ice	17/11/2018	Soil					X								
tp14_0.7		2	Ice	17/11/2018	Soil			X										
tp15_0.1		2	Ice	17/11/2018	Soil	X												
tp15_0.6		2	Ice	17/11/2018	Soil		X	X										
tp16_0.1		1	Ice	17/11/2018	Soil	X												
tp16_0.8		2	Ice	17/11/2018	Soil			X										
tp17_0.1		2	Ice	17/11/2018	Soil					X								
tp17_0.5		2	Ice	17/11/2018	Soil			X										
tp18_0.1		2	Ice	17/11/2018	Soil	X	X			X								
tp18_0.4		2	Ice	17/11/2018	Soil			X										
tp20_0.1		2	Ice	17/11/2018	Soil	X	X			X								
tp20_0.4		2	Ice	17/11/2018	Soil								X					
QA300		1	Ice	17/11/2018	Soil	X												
QA400		1	Ice	17/11/2018	Soil	X												Please forward to ALS
KYE_GUM		4	Ice	17/11/2018	Water								X					
asb2		1	Ice	17/11/2018	Fibre Cement						X							
KYE_TB/TS		2	Ice	17/11/2018	Soil							X						
BH02_0.5		2	Ice	17/11/2018	Soil	X				X								
BH02_1.0		1	Ice	17/11/2018	Soil			X										
BH03_0.5		2	Ice	17/11/2018	Soil	X				X								
BH02_2.0		1	Frozen	17/11/2018	Soil								X					
BH02_2.0-2.45		1	Frozen	17/11/2018	Soil				X									
BH02_4.0-4.45		1	Frozen	17/11/2018	Soil				X									
BH02_5.5-5.95		1	Frozen	17/11/2018	Soil				X									
BH02_7.0-7.45		1	Frozen	17/11/2018	Soil				X									
BH02_8.5-8.95		1	Frozen	17/11/2018	Soil				X									
BH02_10.0-10.45		1	Frozen	17/11/2018	Soil				X									
BH02_11.5-11.95		1	Frozen	17/11/2018	Soil				X									
BH02_13.0-13.45		1	Frozen	17/11/2018	Soil				X									
BH02_14.5-14.95		1	Frozen	17/11/2018	Soil				X									
BH02_16.0-16.45		1	Frozen	17/11/2018	Soil				X									
BH02_17.5-17.95		1	Frozen	17/11/2018	Soil				X									
BH03_1.0-1.1		1	Frozen	17/11/2018	Soil				X									
BH03_2.5-2.95		1	Frozen	17/11/2018	Soil				X									
BH03_4.0-4.45		1	Frozen	17/11/2018	Soil				X									
BH03_5.5-5.95		1	Frozen	17/11/2018	Soil				X									
BH03_7.0-7.45		1	Frozen	17/11/2018	Soil				X									
BH03_8.5-8.95		1	Frozen	17/11/2018	Soil				X									
BH03_10.0-10.45		1	Frozen	17/11/2018	Soil				X									
BH03_11.5-11.95		1	Frozen	17/11/2018	Soil				X									
BH03_13.0-13.45		1	Frozen	17/11/2018	Soil				X									

Relinquished by: Joel Griffiths	**Received by:** Luca D.	**Relinquished by:**	**Received by:**	**Relinquished by:**
(name / company) Cardno	**(name / company)** Eurofins MCT	**(name / company**	**(name / company)**	**(name / company)**
Date & Time: 19/11/18: 13:00	**Date & Time:** 19/11/18 2:52 PM	**Date & Time:**	**Date & Time:**	**Date & Time:**
Signature: JG	**Signature:**	**Signature:**	**Signature:**	**Signature:**
Received by:	**Relinquished by:**	**Received by:**	**Relinquished by:**	***Lab use:***
(name / company)	**(name / company)**	**(name / company**	**(name / company)**	**Samples Received: Cool or Ambient (circle one)**
Date & Time:	**Date & Time:**	**Date & Time:**	**Date & Time:**	**Temperature Received at: (if applicable)**
Signature:	**Signature:**	**Signature:**	**Signature:**	**Transported by: Hand delivered / courier**

#628416

Cardno
Shaping the Future

CHAIN OF CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

Contact Person:	Ben Withnall	**Project Name:**	Kyeemagh Infants School
Telephone Number:	9405 6168	**Project Number:**	80818157
Alternative Contact:	Joel Griffiths	**PO No.:**	
Telephone Number:	9496 7873	**Project Specific Quote No. :**	181029CAR_1
Sampler:	Joel Griffiths	**Date results required:**	Standard TAT
Email Address (results and invoice):	ben.withnall[redacted]cardno.com.au; joel.[redacted]riffiths[redacted]cardno.com.au	**Report format:**	Electronic

Address: Level 9 - The Forum, 203 Pacific Highway, St Leonards, New South Wales 2065

Sample Information						Analysis Required												Comments
Cardno Sample ID	Laboratory Sample ID	No. Containers	Preservation	Date sampled	Matrix	B7*1 - TRH/BTEXN/PAH/Metals 8	B15*1 - OCP/OPP/PCB	B8*1 TRH, VOC, PAH, Metals (8)	pH Field Screen (pH and pHfox)	Asbestos (w/w%)	Asbestos Presence / Absence	BTEX	HOLD	TRH / TPH Silica Gel Cleanup				628416
tp13_0.1		2	Ice	17/11/2018	Soil	X	X	X		X								
tp13_0.4		2	Ice	17/11/2018	Soil					X								
tp14_0.1		2	Ice	17/11/2018	Soil					X								
tp14_0.7		2	Ice	17/11/2018	Soil			X										
tp15_0.1		2	Ice	17/11/2018	Soil	X												
tp15_0.6		2	Ice	17/11/2018	Soil		X	X										
tp16_0.1		1	Ice	17/11/2018	Soil	X												
tp16_0.8		2	Ice	17/11/2018	Soil			X										
tp17_0.1		2	Ice	17/11/2018	Soil					X								
tp17_0.5		2	Ice	17/11/2018	Soil			X										
tp18_0.1		2	Ice	17/11/2018	Soil	X	X			X								
tp18_0.4		2	Ice	17/11/2018	Soil			X										
tp20_0.1		2	Ice	17/11/2018	Soil	X	X			X								
tp20_0.4		2	Ice	17/11/2018	Soil								X					
QA300		1	Ice	17/11/2018	Soil	X												
QA400		1	Ice	17/11/2018	Soil	X												Please forward to ALS
KYE_GUM		4	Ice	17/11/2018	Water									X				
asb2		1	Ice	17/11/2018	Fibre Cement						X							
KYE_TB/TS		2	Ice	17/11/2018	Soil							X						
BH02_0.5		2	Ice	17/11/2018	Soil	X				X								
BH02_1.0		1	Ice	17/11/2018	Soil			X										
BH03_0.5		2	Ice	17/11/2018	Soil	X				X								
BH02_2.0		1	Frozen	17/11/2018	Soil								X					
BH02_2.0-2.45		1	Frozen	17/11/2018	Soil				X									
BH02_4.0-4.45		1	Frozen	17/11/2018	Soil				X									
BH02_5.5-5.95		1	Frozen	17/11/2018	Soil				X									
BH02_7.0-7.45		1	Frozen	17/11/2018	Soil				X									
BH02_8.5-8.95		1	Frozen	17/11/2018	Soil				X									
BH02_10.0-10.45		1	Frozen	17/11/2018	Soil				X									
BH02_11.5-11.95		1	Frozen	17/11/2018	Soil				X									
BH02_13.0-13.45		1	Frozen	17/11/2018	Soil				X									
BH02_14.5-14.95		1	Frozen	17/11/2018	Soil				X									
BH02_16.0-16.45		1	Frozen	17/11/2018	Soil				X									
BH02_17.5-17.95		1	Frozen	17/11/2018	Soil				X									
BH03_1.0-1.1		1	Frozen	17/11/2018	Soil				X									
BH03_2.5-2.95		1	Frozen	17/11/2018	Soil				X									
BH03_4.0-4.45		1	Frozen	17/11/2018	Soil				X									
BH03_5.5-5.95		1	Frozen	17/11/2018	Soil				X									
BH03_7.0-7.45		1	Frozen	17/11/2018	Soil				X									
BH03_8.5-8.95		1	Frozen	17/11/2018	Soil				X									
BH03_10.0-10.45		1	Frozen	17/11/2018	Soil				X									
BH03_11.5-11.95		1	Frozen	17/11/2018	Soil				X									
BH03_13.0-13.45		1	Frozen	17/11/2018	Soil				X									

Relinquished by: Joel Griffiths	**Received by:** VLONG	**Relinquished by:**	**Received by:**	**Relinquished by:**
(name / company) Cardno	(name / company)	(name / company	(name / company)	(name / company)
Date & Time: 19/11/18, 13:00	**Date & Time:** 20/11 11:30a	**Date & Time:**	**Date & Time:**	**Date & Time:**
Signature: JG	**Signature:**	**Signature:**	**Signature:**	**Signature:**
Received by:	**Relinquished by:**	**Received by:**	**Relinquished by:**	**Lab use:**
(name / company)	(name / company)	(name / company	(name / company)	**Samples Received:** Cool or Ambient (circle one)
Date & Time:	**Date & Time:**	**Date & Time:**	**Date & Time:**	**Temperature Received at:** (if applicable)
Signature:	**Signature:**	**Signature:**	**Signature:**	**Transported by:** Hand delivered / courier

CHAIN OF COUSTODY AND ANALYSIS REQUEST

Cardno
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Page 1 of 1

Contact Person:	Ben Withnall	**Project Name:**	Kyeemagh Infants School
Telephone Number:	9495 8188	**Project Number:**	80818157
Alternative Contact:	Joel Griffiths	**PO No.:**	
Telephone Number:	9496 7873	**Project Specific Quote No. :**	181029CAR_1
Sampler:	Joel Griffiths	**Date results required:**	Standard TAT
Email Address (results and invoice):	ben.withnall@cardno.com.au; joel.griffiths@cardno.com.au	**Report format:**	Electronic
Address: Level 9 - The Forum, 203 Pacific Highway, St Leonards, New South Wales 2065			

628416

Sample Information						Analysis Required												Comments
Cardno Sample ID	Laboratory Sample ID	No. Containers	Preservation	Date sampled	Matrix	B7*1 - TRH/BTEXN/PAH/Metals 8	B15*1 - OCP/OPP/PCB	B6*1 TRH, VOC, PAH, Metals (8)	pH Field Screen (pH and pHfox)	Asbestos (w/w%)	Asbestos Presence / Absence	BTEX	HOLD	TRH / TPH Silica Gel Cleanup				
tp13_0.1		2	Ice	17/11/2018	Soil	X	X	X		X								
tp13_0.4		2	Ice	17/11/2018	Soil					X								
tp14_0.1		2	Ice	17/11/2018	Soil					X								
tp14_0.7		2	Ice	17/11/2018	Soil			X										
tp15_0.1		2	Ice	17/11/2018	Soil	X												
tp15_0.6		2	Ice	17/11/2018	Soil		X	X										
tp16_0.1		1	Ice	17/11/2018	Soil	X												
tp16_0.8		2	Ice	17/11/2018	Soil			X										
tp17_0.1		2	Ice	17/11/2018	Soil					X								
tp17_0.5		2	Ice	17/11/2018	Soil			X										
tp18_0.1		2	Ice	17/11/2018	Soil	X	X			X								
tp18_0.4		2	Ice	17/11/2018	Soil			X										
tp20_0.1		2	Ice	17/11/2018	Soil	X	X			X								
tp20_0.4		2	Ice	17/11/2018	Soil								X					
QA500		1	Ice	17/11/2018	Soil	X												
QA400		1	Ice	17/11/2018	Soil	X												
KYE_GUM		4	Ice	17/11/2018	Water									X				Please forward to ALS
asb2		1	Ice	17/11/2018	Fibre Cement						X							
KYE_TB/TS		2	Ice	17/11/2018	Soil							X						
KYE_Rin		4	Ice	17/11/2018	Water			X										
BH02_0.5		2	Ice	17/11/2018	Soil	X				X								
BH02_1.0		1	Ice	17/11/2018	Soil			X										
BH03_0.5		2	Ice	17/11/2018	Soil	X				X								
BH02_2.0		1	Frozen	17/11/2018	Soil								X					
BH02_2.0-2.45		1	Frozen	17/11/2018	Soil				X									
BH02_4.0-4.45		1	Frozen	17/11/2018	Soil				X									
BH02_5.5-5.95		1	Frozen	17/11/2018	Soil				X									
BH02_7.0-7.45		1	Frozen	17/11/2018	Soil				X									
BH02_8.5-8.95		1	Frozen	17/11/2018	Soil				X									
BH02_10.0-10.45		1	Frozen	17/11/2018	Soil				X									
BH02_11.5-11.95		1	Frozen	17/11/2018	Soil				X									
BH02_13.0-13.45		1	Frozen	17/11/2018	Soil				X									
BH02_14.5-14.95		1	Frozen	17/11/2018	Soil				X									
BH02_16.0-16.45		1	Frozen	17/11/2018	Soil				X									
BH02_17.5-17.95		1	Frozen	17/11/2018	Soil				X									
BH03_1.0-1.1		1	Frozen	17/11/2018	Soil				X									
BH03_2.5-2.95		1	Frozen	17/11/2018	Soil				X									
BH03_4.0-4.45		1	Frozen	17/11/2018	Soil				X									
BH03_5.5-5.95		1	Frozen	17/11/2018	Soil				X									
BH03_7.0-7.45		1	Frozen	17/11/2018	Soil				X									
BH03_8.5-8.95		1	Frozen	17/11/2018	Soil				X									
BH03_10.0-10.45		1	Frozen	17/11/2018	Soil				X									
BH03_11.5-11.95		1	Frozen	17/11/2018	Soil				X									
BH03_13.0-13.45		1	Frozen	17/11/2018	Soil				X									

Relinquished by: Joel Griffiths	**Received by:** ULNG	**Relinquished by:**	**Received by:**	**Relinquished by:**
(name / company) Cardno	**(name / company)**	**(name / company)**	**(name / company)**	**(name / company)**
Date & Time: 19/11/18: 13:00	**Date & Time:** 20/11 5:59	**Date & Time:**	**Date & Time:**	**Date & Time:**
Signature: JG	**Signature:**	**Signature:**	**Signature:**	**Signature:**
Received by:	**Relinquished by:**	**Received by:**	**Relinquished by:**	**Lab use:**
(name / company)	**(name / company)**	**(name / company)**	**(name / company)**	**Samples Received:** Cool or Ambient (circle one)
Date & Time:	**Date & Time:**	**Date & Time:**	**Date & Time:**	**Temperature Received at:** (if applicable)
Signature:	**Signature:**	**Signature:**	**Signature:**	**Transported by:** Hand delivered / courier

eurofins | mgt

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**Cardno (NSW/ACT) Pty Ltd**
Contact name:	Ben Withnall
Project name:	KYEEMAGH INFANTS SCHOOL
Project ID:	80818157
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Nov 19, 2018 2:52 PM
Eurofins | mgt reference:	**628416**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☑ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

Sample QA400 forwarded to ALS.

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Ben Withnall - ben.withnall@cardno.com.au.

Note: A copy of these results will also be delivered to the general Cardno (NSW/ACT) Pty Ltd email address.

CERTIFICATE OF ANALYSIS

Work Order	: **ES1834552**	Page	: 1 of 6
Client	: **CARDNO (NSW/ACT) PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WITHNALL	Contact	: Customer Services ES
Address	: Level 9 The Forum 203 Pacific Highway St Leonards NSW 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 2 9495 8188	Telephone	: +61-2-8784 8555
Project	: 80818157 Kyeemagh Infants School	Date Samples Received	: 20-Nov-2018 12:12
Order number	:	Date Analysis Commenced	: 22-Nov-2018
C-O-C number	: ----	Issue Date	: 27-Nov-2018 15:29
Sampler	: JOEL GRIFFITHS		
Site	: ----		
Quote number	: EN/222 - Secondary Work		
No. of samples received	: 1		
No. of samples analysed	: 1		

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*
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	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 sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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

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

- 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, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)	*Client sample ID*			**QA400**	----	----	----	----
			Client sampling date / time	17-Nov-2018 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1834552-001**	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**1.6**	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	<2	----	----	----	----
Copper	7440-50-8	5	mg/kg	**5**	----	----	----	----
Lead	7439-92-1	5	mg/kg	**21**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	<2	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**22**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	**0.6**	----	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	**1.2**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Client sample ID	**QA400**	----	----	----	----
			Client sampling date / time	17-Nov-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	**ES1834552-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued								
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	<50	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	<50	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	----	----	----	----
^ **Total Xylenes**	----	0.5	mg/kg	<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**98.2**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**95.2**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**56.0**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**90.2**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	**112**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	**98.5**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**95.9**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	**106**	----	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL)**			*Client sample ID*	**QA400**	**----**	**----**	**----**	**----**
			Client sampling date / time	17-Nov-2018 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1834552-001**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates - Continued								
4-Bromofluorobenzene	460-00-4	0.2	%	**103**	**----**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

QUALITY CONTROL REPORT

Work Order	: **ES1834552**	Page	: 1 of 7
Client	: **CARDNO (NSW/ACT) PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WITHNALL	Contact	: Customer Services ES
Address	: Level 9 The Forum 203 Pacific Highway St Leonards NSW 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 2 9495 8188	Telephone	: +61-2-8784 8555
Project	: 80818157 Kyeemagh Infants School	Date Samples Received	: 20-Nov-2018
Order number	:	Date Analysis Commenced	: 22-Nov-2018
C-O-C number	: ----	Issue Date	: 27-Nov-2018
Sampler	: JOEL GRIFFITHS		
Site	: ----		
Quote number	: EN/222 - Secondary Work		
No. of samples received	: 1		
No. of samples analysed	: 1		

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 Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2051490)									
ES1834530-001	Anonymous	EA055: Moisture Content	----	0.1	%	6.9	7.3	4.91	No Limit
ES1834551-004	Anonymous	EA055: Moisture Content	----	0.1	%	7.8	7.5	3.09	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 2055623)									
ES1834537-032	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	22	23	0.00	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	12	13	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	14	14	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	9	9	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	13	12	0.00	No Limit
ES1834740-007	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	24	24	0.00	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	17	17	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	12	13	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	20	20	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	18	18	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	68	68	0.00	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2055622)									
ES1834537-032	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1834740-007	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	0.1	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2050269)									
ES1834551-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2050269) - continued									
ES1834551-001	Anonymous	EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1834786-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2050270)									
ES1834551-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2050270) - continued									
ES1834551-001	Anonymous	EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1834786-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2050742)									
ES1834537-032	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1834786-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2050270)									
ES1834551-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1834786-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2050742)									
ES1834537-032	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1834786-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 2050742)									
ES1834537-032	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1834786-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 2055623)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	96.1	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	97.7	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	88.7	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	99.9	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	95.7	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	98.5	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	101	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2055622)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	81.5	70	105
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2050269)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	93.4	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	95.5	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	90.7	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	91.0	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	89.3	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	90.7	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	92.3	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	90.7	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	93.6	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	90.1	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	95.0	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	93.4	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	91.5	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	86.5	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	85.7	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	93.7	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2050270)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	108	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	113	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	108	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2050742)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	97.7	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2050270)								

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	**CAS Number**	**LOR**	**Unit**	**Result**	**Concentration**	**LCS**	**Low**	**High**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2050270) - continued								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	110	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	114	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	83.5	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2050742)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	104	68	128
EP080: BTEXN (QCLot: 2050742)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	98.0	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	105	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	99.5	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	101	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	98.4	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	89.8	63	119

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	**Client sample ID**	**Method: Compound**	**CAS Number**	**Concentration**	**MS**	**Low**	**High**
EG005T: Total Metals by ICP-AES (QCLot: 2055623)							
ES1834537-032	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	90.6	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	96.8	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	98.8	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	96.2	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	94.3	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	98.3	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	100	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2055622)							
ES1834537-032	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	103	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2050269)							
ES1834551-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	91.8	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	93.4	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2050270)							
ES1834551-001	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	97.7	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	114	53	131

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2050270) - continued							
ES1834551-001	Anonymous	EP071: C29 - C36 Fraction	----	1714 mg/kg	125	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2050742)							
ES1834537-032	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	117	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2050270)							
ES1834551-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	100	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	117	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	116	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2050742)							
ES1834537-032	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	121	70	130
EP080: BTEXN (QCLot: 2050742)							
ES1834537-032	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	111	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	115	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	110	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	109	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	106	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	89.7	70	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1834552**	Page	: 1 of 4
Client	: **CARDNO (NSW/ACT) PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WITHNALL	Telephone	: +61-2-8784 8555
Project	: 80818157 Kyeemagh Infants School	Date Samples Received	: 20-Nov-2018
Site	: ----	Issue Date	: 27-Nov-2018
Sampler	: JOEL GRIFFITHS	No. of samples received	: 1
Order number	:	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) QA400	**17-Nov-2018**	**----**	----	----	**22-Nov-2018**	01-Dec-2018	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) QA400	**17-Nov-2018**	**24-Nov-2018**	16-May-2019	✓	**26-Nov-2018**	16-May-2019	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) QA400	**17-Nov-2018**	**24-Nov-2018**	15-Dec-2018	✓	**26-Nov-2018**	15-Dec-2018	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) QA400	**17-Nov-2018**	**22-Nov-2018**	01-Dec-2018	✓	**23-Nov-2018**	01-Jan-2019	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071) QA400	**17-Nov-2018**	**22-Nov-2018**	01-Dec-2018	✓	**23-Nov-2018**	01-Jan-2019	✓
Soil Glass Jar - Unpreserved (EP080) QA400	**17-Nov-2018**	**22-Nov-2018**	01-Dec-2018	✓	**26-Nov-2018**	01-Dec-2018	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP071) QA400	**17-Nov-2018**	**22-Nov-2018**	01-Dec-2018	✓	**23-Nov-2018**	01-Jan-2019	✓
Soil Glass Jar - Unpreserved (EP080) QA400	**17-Nov-2018**	**22-Nov-2018**	01-Dec-2018	✓	**26-Nov-2018**	01-Dec-2018	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) QA400	**17-Nov-2018**	**22-Nov-2018**	01-Dec-2018	✓	**26-Nov-2018**	01-Dec-2018	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

Cardno
Shaping the Future

CHAIN OF CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

Contact Person:	Ben Withnall	**Project Name:**	Kyeemagh Infants School
Telephone Number:	9495 8166	**Project Number:**	80818157
Alternative Contact:	Joel Griffiths	**PO No.:**	
Telephone Number:	9496 7873	**Project Specific Quote No. :**	181029CAR_1
Sampler:	Joel Griffiths	**Date results required:**	Standard TAT
Email Address (results and invoice):	ben.withnall@cardno.com.au; joel.griffiths@cardno.com.au	**Report format:**	Electronic

Address: Level 9 - The Forum, 203 Pacific Highway, St Leonards, New South Wales 2065

Sample Information						Analysis Required												Comments
Cardno Sample ID	Laboratory Sample ID	No. Containers	Preservation	Date sampled	Matrix	B7*1 - TRH/BTEXN/PAH/Metals 8												
QA400		1	Ice	17/11/2018	Soil	X												

Environmental Division
Sydney
Work Order Reference
ES1834552

Telephone : + 61-2-8784 8555

Relinquished by: Joel Griffiths
(name / company) Cardno
Date & Time: 17/11/18: 13:00
Signature: JG

Received by:
(name / company)
Date & Time:
Signature:

Relinquished by:
(name / company
Date & Time:
Signature:

Received by:
(name / company)
Date & Time:
Signature:

Relinquished by:
(name / company)
Date & Time:
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Received by:
(name / company)
Date & Time:
Signature:

Relinquished by:
(name / company)
Date & Time:
Signature:

Received by:
(name / company
Date & Time:
Signature:

Relinquished by:
(name / company)
Date & Time:
Signature:

Lab use:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: (if applicable)
Transported by: Hand delivered / courier

Cardno Shaping the Future

CHAIN OF CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

Contact Person: Ben Withnall
Telephone Number: 9496 8188
Alternative Contact: Joel Griffiths
Telephone Number: 9496 7873
Sampler: Joel Griffiths
Email Address (results and invoice): ben.withnall@cardno.com.au; joel.griffiths@cardno.com.au
Address: Level 9 - The Forum, 203 Pacific Highway, St Leonards, New South Wales 2065

Project Name: Kyeemagh Infants School
Project Number: 80818157
PO No.:
Project Specific Quote No.: 181029CAR_1
Date results required: Standard TAT
Report format: Electronic

Cardno Sample ID	Laboratory Sample ID	No. Containers	Preservation	Date sampled	Matrix	B7*1 - TRH/BTEXN/PAH/Metals 8	B15*1 - OCP/OPP/PCB	B8*1 TRH, VOC, PAH, Metals (8)	pH Field Screen (pH and pHfox)	Asbestos (w/w%)	Asbestos Presence / Absence	BTEX	HOLD					Comments
tp13_0.1		2	Ice	17/11/2018	Soil	X	X	X		X								
tp13_0.4		2	Ice	17/11/2018	Soil					X								
tp14_0.1		2	Ice	17/11/2018	Soil					X								
tp14_0.7		2	Ice	17/11/2018	Soil			X										
tp15_0.1		2	Ice	17/11/2018	Soil	X												
tp15_0.6		2	Ice	17/11/2018	Soil		X	X										
tp16_0.1		1	Ice	17/11/2018	Soil	X												
tp16_0.8		2	Ice	17/11/2018	Soil			X										
tp17_0.1		2	Ice	17/11/2018	Soil					X								
tp17_0.5		2	Ice	17/11/2018	Soil			X										
tp18_0.1		2	Ice	17/11/2018	Soil	X	X			X								
tp18_0.4		2	Ice	17/11/2018	Soil			X										
tp20_0.1		2	Ice	17/11/2018	Soil	X	X			X								
tp20_0.4		2	Ice	17/11/2018	Soil								X					
QA300		1	Ice	17/11/2018	Soil	X												
QA400		1	Ice	17/11/2018	Soil	X												Please forward to ALS
KYE_GUM		4	Ice	17/11/2018	Water								X					
asb2		1	Ice	17/11/2018	Fibre Cement						X							
KYE_TB/TS		2	Ice	17/11/2018	Soil							X						
BH02_0.5		2	Ice	17/11/2018	Soil	X				X								
BH02_1.0		1	Ice	17/11/2018	Soil			X										
BH03_0.5		2	Ice	17/11/2018	Soil	X				X								
BH02_2.0		1	Frozen	17/11/2018	Soil								X					
BH02_2.0-2.45		1	Frozen	17/11/2018	Soil				X									
BH02_4.0-4.45		1	Frozen	17/11/2018	Soil				X									
BH02_5.5-5.95		1	Frozen	17/11/2018	Soil				X									
BH02_7.0-7.45		1	Frozen	17/11/2018	Soil				X									
BH02_8.5-8.95		1	Frozen	17/11/2018	Soil				X									
BH02_10.0-10.45		1	Frozen	17/11/2018	Soil				X									
BH02_11.5-11.95		1	Frozen	17/11/2018	Soil				X									
BH02_13.0-13.45		1	Frozen	17/11/2018	Soil				X									
BH02_14.5-14.95		1	Frozen	17/11/2018	Soil				X									
BH02_16.0-16.45		1	Frozen	17/11/2018	Soil				X									
BH02_17.5-17.95		1	Frozen	17/11/2018	Soil				X									
BH03_1.0-1.1		1	Frozen	17/11/2018	Soil				X									
BH03_2.5-2.95		1	Frozen	17/11/2018	Soil				X									
BH03_4.0-4.45		1	Frozen	17/11/2018	Soil				X									
BH03_5.5-5.95		1	Frozen	17/11/2018	Soil				X									
BH03_7.0-7.45		1	Frozen	17/11/2018	Soil				X									
BH03_8.5-8.95		1	Frozen	17/11/2018	Soil				X									
BH03_10.0-10.45		1	Frozen	17/11/2018	Soil				X									
BH03_11.5-11.95		1	Frozen	17/11/2018	Soil				X									
BH03_13.0-13.45		1	Frozen	17/11/2018	Soil				X									

ES1834552
WO # Assigned at ALS Crows Nest

Relinquished by: Joel Griffiths
(name / company) Cardno
Date & Time: 19/11/18 13:00
Signature: JG
Received by: Sep - ALS Crows Nest
(name / company)
Date & Time: 20/11/18 12:12pm 9.3°C
Signature:

Received by: Luca D.
(name / company) Eurofins MGT
Date & Time: 19/11/18 2:52 PM
Signature:
Relinquished by:
(name / company)
Date & Time:
Signature:

Relinquished by:
(name / company)
Date & Time:
Signature:
Received by: MGS Manuh As subcontracted
(name / company)
Date & Time: 20/11/18 3:00pm
Signature:

Received by:
(name / company)
Date & Time:
Signature:
Relinquished by:
(name / company)
Date & Time:
Signature:

Relinquished by:
(name / company)
Date & Time:
Signature:
Lab use:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: (if applicable) 7.1°C
Transported by: Hand delivered / courier

#628416

Cardno (NSW/ACT) Pty Ltd
Level 9, 203 Pacific Highway
St Leonards
NSW 2065

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention:	**Ben Withnall**
Report	**630561-S**
Project name	KYEEMAGH INFANTS SCHOOL
Project ID	80818157
Received Date	Nov 28, 2018

Client Sample ID			**BH02_4.0-4.45**	**BH02_7.0-7.45**	**BH02_11.5-11.95**	**BH03_8.5-8.95**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**B18-No41456**	**B18-No41457**	**B18-No41458**	**B18-No41459**
Date Sampled			**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**
Test/Reference	LOR	Unit				
SPOCAS Suite						
pH-KCL	0.1	pH Units	5.9	9.1	9.3	9.3
pH-OX	0.1	pH Units	7.2	7.2	7.4	7.5
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2	< 2	< 2	< 2
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	< 2	< 2	< 2	< 2
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	< 2	< 2	< 2	< 2
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02	< 0.02	< 0.02
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02	< 0.02	< 0.02
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02	< 0.02	< 0.02
Sulfur - KCl Extractable	0.02	% S	< 0.02	0.05	< 0.02	0.02
Sulfur - Peroxide	0.02	% S	0.24	0.10	0.09	0.37
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	0.24	0.06	0.09	0.35
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	150	34	54	220
HCl Extractable Sulfur	0.02	% S	n/a	n/a	n/a	n/a
Net Acid soluble sulfur	0.02	% S	n/a	n/a	n/a	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	n/a	n/a	n/a
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	n/a	n/a	n/a	n/a
Calcium - KCl Extractable	0.02	% Ca	< 0.02	0.19	0.10	0.15
Calcium - Peroxide	0.02	% Ca	0.60	0.25	0.24	0.69
Acid Reacted Calcium	0.02	% Ca	0.60	0.06	0.13	0.54
acidity - Acid Reacted Calcium	10	mol H+/t	300	28	67	270
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	0.48	0.04	0.11	0.43
Magnesium - KCl Extractable	0.02	% Mg	< 0.02	< 0.02	< 0.02	0.04
Magnesium - Peroxide	0.02	% Mg	< 0.02	0.03	0.02	0.08
Acid Reacted Magnesium	0.02	% Mg	< 0.02	0.03	0.02	0.04
acidity - Acid Reacted Magnesium	10	mol H+/t	< 10	23	20	33
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	< 0.02	0.04	0.03	0.05
Acid Neutralising Capacity (ANCE)	0.02	%CaCO3	0.42	0.21	0.24	0.38
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	84	42	47	77
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	0.13	0.07	0.08	0.12
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	0.24	< 0.02	< 0.02	0.03
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	150	< 10	< 10	22
SPOCAS - Liming rate	1	kg CaCO3/t	11	< 1	< 1	2.0

Client Sample ID			**BH02_4.0-4.45**	**BH02_7.0-7.45**	**BH02_11.5-11.95**	**BH03_8.5-8.95**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**B18-No41456**	**B18-No41457**	**B18-No41458**	**B18-No41459**
Date Sampled			**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**	**Nov 17, 2018**
Test/Reference	LOR	Unit				
Chromium Suite						
pH-KCL	0.1	pH Units	5.9	9.1	9.3	9.3
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2	< 2	< 2	< 2
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02	< 0.02	< 0.02
Chromium Reducible Sulfur[S04]	0.005	% S	< 0.005	0.13	0.082	0.29
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	81	51	180
Sulfur - KCl Extractable	0.02	% S	< 0.02	0.05	< 0.02	0.02
HCl Extractable Sulfur	0.02	% S	n/a	n/a	n/a	n/a
Net Acid soluble sulfur	0.02	% S	n/a	n/a	n/a	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	n/a	n/a	n/a
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	n/a	n/a	n/a	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	1.8	0.98	3.3
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	n/a	350	200	650
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)[S03]	0.02	% S	n/a	0.56	0.31	1.0
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	< 0.02	< 0.02	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	< 10	< 10	< 10	< 10
CRS Suite - Liming Rate[S01]	1	kg CaCO3/t	< 1	< 1	< 1	< 1
Extraneous Material						
<2mm Fraction	0.005	g	56	71	63	70
>2mm Fraction	0.005	g	< 0.005	< 0.005	2.3	0.79
Analysed Material	0.1	%	100	100	97	99
Extraneous Material	0.1	%	< 0.1	< 0.1	3.4	1.1
% Moisture	1	%	17	24	17	22

Client Sample ID			**BH03_10.0-10.45**
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**B18-No41460**
Date Sampled			**Nov 17, 2018**
Test/Reference	LOR	Unit	
SPOCAS Suite			
pH-KCL	0.1	pH Units	8.2
pH-OX	0.1	pH Units	2.6
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	210
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	210
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	0.34
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	0.34
Sulfur - KCl Extractable	0.02	% S	< 0.02
Sulfur - Peroxide	0.02	% S	0.48
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	0.48
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	300
HCl Extractable Sulfur	0.02	% S	n/a
Net Acid soluble sulfur	0.02	% S	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a

Client Sample ID			**BH03_10.0-10.45**
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**B18-No41460**
Date Sampled			**Nov 17, 2018**
Test/Reference	LOR	Unit	
SPOCAS Suite			
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	n/a
Calcium - KCl Extractable	0.02	% Ca	0.07
Calcium - Peroxide	0.02	% Ca	0.10
Acid Reacted Calcium	0.02	% Ca	0.02
acidity - Acid Reacted Calcium	10	mol H+/t	12
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	0.02
Magnesium - KCl Extractable	0.02	% Mg	0.03
Magnesium - Peroxide	0.02	% Mg	0.08
Acid Reacted Magnesium	0.02	% Mg	0.05
acidity - Acid Reacted Magnesium	10	mol H+/t	40
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	0.06
Acid Neutralising Capacity (ANCE)	0.02	%CaCO3	n/a
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	n/a
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	n/a
ANC Fineness Factor		factor	1.5
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	0.39
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	240
SPOCAS - Liming rate	1	kg CaCO3/t	18
Chromium Suite			
pH-KCL	0.1	pH Units	8.2
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02
Chromium Reducible Sulfur[S04]	0.005	% S	0.35
Chromium Reducible Sulfur -acidity units	3	mol H+/t	220
Sulfur - KCl Extractable	0.02	% S	< 0.02
HCl Extractable Sulfur	0.02	% S	n/a
Net Acid soluble sulfur	0.02	% S	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	0.75
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	150
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)[S03]	0.02	% S	0.24
ANC Fineness Factor		factor	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	0.19
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	120
CRS Suite - Liming Rate[S01]	1	kg CaCO3/t	8.8
Extraneous Material			
<2mm Fraction	0.005	g	61
>2mm Fraction	0.005	g	< 0.005
Analysed Material	0.1	%	100
Extraneous Material	0.1	%	< 0.1
% Moisture	1	%	19

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
SPOCAS Suite			
SPOCAS Suite	Brisbane	Dec 05, 2018	6 Week
- Method: LTM-GEN-7050			
Chromium Reducible Sulfur Suite			
Chromium Suite	Brisbane	Dec 05, 2018	6 Week
- Method: LTM-GEN-7070			
Extraneous Material	Brisbane	Dec 05, 2018	6 Week
- Method: LTM-GEN-7050/7070			
% Moisture	Brisbane	Nov 30, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: Cardno (NSW/ACT) Pty Ltd
Address: Level 9, 203 Pacific Highway
St Leonards
NSW 2065

Project Name: KYEEMAGH INFANTS SCHOOL
Project ID: 80818157

Order No.:
Report #: 630561
Phone: 0294967700
Fax: 02 9499 3902

Received: Nov 28, 2018 3:45 PM
Due: Dec 5, 2018
Priority: 5 Day
Contact Name: Ben Withnall

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						SPOCAS Suite	Chromium Reducible Sulfur Suite	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	BH02_4.0-4.45	Nov 17, 2018		Soil	B18-No41456	X	X	X
2	BH02_7.0-7.45	Nov 17, 2018		Soil	B18-No41457	X	X	X
3	BH02_11.5-11.95	Nov 17, 2018		Soil	B18-No41458	X	X	X
4	BH03_8.5-8.95	Nov 17, 2018		Soil	B18-No41459	X	X	X
5	BH03_10.0-10.45	Nov 17, 2018		Soil	B18-No41460	X	X	X
Test Counts						5	5	5

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery									
Chromium Suite									
Chromium Reducible Sulfur			%	99			70-130	Pass	
Acid Neutralising Capacity (ANCbt)			%	98			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
SPOCAS Suite				Result 1	Result 2	RPD			
pH-KCL	B18-No41456	CP	pH Units	5.9	5.9	1.0	30%	Pass	
pH-OX	B18-No41456	CP	pH Units	7.2	7.2	1.0	30%	Pass	
Acid trail - Titratable Actual Acidity	B18-No41456	CP	mol H+/t	< 2	< 2	<1	30%	Pass	
Acid trail - Titratable Peroxide Acidity	B18-No41456	CP	mol H+/t	< 2	< 2	<1	30%	Pass	
Acid trail - Titratable Sulfidic Acidity	B18-No41456	CP	mol H+/t	< 2	< 2	<1	30%	Pass	
sulfidic - TAA equiv. S% pyrite	B18-No41456	CP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - TPA equiv. S% pyrite	B18-No41456	CP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - TSA equiv. S% pyrite	B18-No41456	CP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - KCl Extractable	B18-No41456	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide	B18-No41456	CP	% S	0.24	0.25	3.0	30%	Pass	
Sulfur - Peroxide Oxidisable Sulfur	B18-No41456	CP	% S	0.24	0.25	3.0	30%	Pass	
acidity - Peroxide Oxidisable Sulfur	B18-No41456	CP	mol H+/t	150	150	3.0	30%	Pass	
Calcium - KCl Extractable	B18-No41456	CP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
Calcium - Peroxide	B18-No41456	CP	% Ca	0.60	0.63	5.0	30%	Pass	
Acid Reacted Calcium	B18-No41456	CP	% Ca	0.60	0.63	5.0	30%	Pass	
acidity - Acid Reacted Calcium	B18-No41456	CP	mol H+/t	300	310	5.0	30%	Pass	
sulfidic - Acid Reacted Ca equiv. S% pyrite	B18-No41456	CP	% S	0.48	0.50	5.0	30%	Pass	
Magnesium - KCl Extractable	B18-No41456	CP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - Peroxide	B18-No41456	CP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
Acid Reacted Magnesium	B18-No41456	CP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Magnesium	B18-No41456	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Mg equiv. S% pyrite	B18-No41456	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Acid Neutralising Capacity (ANCE)	B18-No41456	CP	%CaCO3	0.42	0.40	4.0	30%	Pass	
Acid Neutralising Capacity - Acidity units (a-ANCE)	B18-No41456	CP	mol H+/t	84	80	4.0	30%	Pass	
ANC Fineness Factor	B18-No41456	CP	factor	1.5	1.5	<1	30%	Pass	
SPOCAS - Liming rate	B18-No41456	CP	kg CaCO3/t	11	12	3.0	30%	Pass	
Duplicate									
Chromium Suite				Result 1	Result 2	RPD			
Chromium Reducible Sulfur	B18-No41456	CP	% S	< 0.005	< 0.005	<1	30%	Pass	
Chromium Reducible Sulfur -acidity units	B18-No41456	CP	mol H+/t	< 3	< 3	<1	30%	Pass	
Acid Neutralising Capacity (ANCbt)	B18-No41456	CP	%CaCO3	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B18-No41456	CP	% S	n/a	n/a	n/a	30%	Pass	
CRS Suite - Net Acidity (Sulfur Units)	B18-No41456	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
CRS Suite - Net Acidity (Acidity Units)	B18-No41456	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
CRS Suite - Liming Rate	B18-No41456	CP	kg CaCO3/t	< 1	< 1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B18-No15557	NCP	%	< 1	< 1	<1	30%	Pass	

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
S01	Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO3) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m3 in-situ soil' multiply 'reported results' x 'wet bulk density of soil in t/m3'
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5
S03	Acid Neutralising Capacity is only required if the pHKCl if greater than or equal to pH 6.5
S04	Acid Sulfate Soil Samples have a 24 hour holding time unless frozen or dried within that period

Authorised By

Nibha Vaidya	Analytical Services Manager
Myles Clark	Senior Analyst-SPOCAS (QLD)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Rebatch

Cardno
Shaping the Future

CHAIN OF CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

630561

Contact Person: Ben Withnall
Telephone Number: 9495 8188
Alternative Contact: Joel Griffiths
Telephone Number: 9496 7873
Sampler: Joel Griffiths
Email Address (results and invoice): ben.withnall@cardno.com.au; joel.griffiths@cardno.com.au
Address: Level 9 - The Forum, 203 Pacific Highway, St Leonards, New South Wales 2065

Project Name: Kyeemagh Infants School
Project Number: 80818157
PO No.:
Project Specific Quote No. : 181029CAR_1
Date results required: Standard TAT
Report format: Electronic

Sample information						Analysis Required		Comments
Cardno Sample ID	Laboratory Sample ID	No. Containers	Preservation	Date sampled	Matrix	Chromium Reducible Sulfur Suite	SPOCAS	
BH02_4.0-4.45		1	Frozen	17/11/2018	Soil	X	X	
BH02_7.0-7.45		1	Frozen	17/11/2018	Soil	X	X	
BH02_11.5-11.95		1	Frozen	17/11/2018	Soil	X	X	
BH03_8.5-8.95		1	Frozen	17/11/2018	Soil	X	X	
BH03_10.0-10.45		1	Frozen	17/11/2018	Soil	X	X	

Relinquished by: Joel Griffiths
(name / company) Cardno
Date & Time: 12/11/18: 12:00
Signature: JG

Received by: [illegible]
(name / company) [illegible]
Date & Time: 30/11 3:45pm
Signature:

Relinquished by:
(name / company
Date & Time:
Signature:

Received by:
(name / company)
Date & Time:
Signature:

Relinquished by:
(name / company)
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Date & Time:
Signature:

Received by:
(name / company
Date & Time:
Signature:

Relinquished by:
(name / company)
Date & Time:
Signature:

Lab use:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: (if applicable)
Transported by: Hand delivered / courier

Sample Receipt Advice

Company name: **Cardno (NSW/ACT) Pty Ltd**

Contact name: Ben Withnall
Project name: KYEEMAGH INFANTS SCHOOL
Project ID: 80818157
COC number: Not provided
Turn around time: 5 Day
Date/Time received: Nov 28, 2018 3:45 PM
Eurofins | mgt reference: **630561**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Ben Withnall - ben.withnall@cardno.com.au.

Note: A copy of these results will also be delivered to the general Cardno (NSW/ACT) Pty Ltd email address.

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Cardno (NSW/ACT) Pty Ltd
Level 9, 203 Pacific Highway
St Leonards
NSW 2065

Attention: **Ben Withnall**

Report **629911-S**
Project name KYEEMAGH INFANTS SCHOOL
Project ID 80818157
Received Date Nov 23, 2018

Client Sample ID			**BH01_1.0-1.45**	**BH01_8.5-8.95**	**BH01_10.0-10.45**	**BH01_16.0-16.45**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**B18-No36075**	**B18-No36076**	**B18-No36077**	**B18-No36078**
Date Sampled			**Not Provided**	**Not Provided**	**Not Provided**	**Not Provided**
Test/Reference	LOR	Unit				
SPOCAS Suite						
pH-KCL	0.1	pH Units	5.8	9.0	9.2	5.5
pH-OX	0.1	pH Units	4.8	7.3	7.0	4.4
Acid trail - Titratable Actual Acidity	2	mol H+/t	3.0	< 2	< 2	7.0
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	< 2	< 2	< 2	47
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	< 2	< 2	< 2	40
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02	< 0.02	< 0.02
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02	< 0.02	0.08
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02	< 0.02	0.06
Sulfur - KCl Extractable	0.02	% S	< 0.02	0.05	0.04	< 0.02
Sulfur - Peroxide	0.02	% S	< 0.02	0.45	0.19	0.06
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	< 0.02	0.40	0.15	0.07
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	< 10	250	95	40
HCl Extractable Sulfur	0.02	% S	n/a	n/a	n/a	n/a
Net Acid soluble sulfur	0.02	% S	n/a	n/a	n/a	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	n/a	n/a	n/a
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	n/a	n/a	n/a	n/a
Calcium - KCl Extractable	0.02	% Ca	< 0.02	0.20	0.13	0.03
Calcium - Peroxide	0.02	% Ca	< 0.02	0.70	0.29	0.03
Acid Reacted Calcium	0.02	% Ca	< 0.02	0.50	0.16	< 0.02
acidity - Acid Reacted Calcium	10	mol H+/t	< 10	250	80	< 10
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	< 0.02	0.40	0.13	< 0.02
Magnesium - KCl Extractable	0.02	% Mg	< 0.02	0.05	0.02	0.03
Magnesium - Peroxide	0.02	% Mg	< 0.02	0.12	0.06	0.04
Acid Reacted Magnesium	0.02	% Mg	< 0.02	0.07	0.04	< 0.02
acidity - Acid Reacted Magnesium	10	mol H+/t	< 10	56	33	< 10
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	< 0.02	0.09	0.05	< 0.02
Acid Neutralising Capacity (ANCE)	0.02	%CaCO3	n/a	0.90	0.28	n/a
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	n/a	180	55	n/a
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	n/a	0.29	0.09	n/a
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	< 0.02	< 0.02	0.08
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	< 10	< 10	< 10	48
SPOCAS - Liming rate	1	kg CaCO3/t	< 1	< 1	< 1	4.0

Client Sample ID			**BH01_1.0-1.45**	**BH01_8.5-8.95**	**BH01_10.0-10.45**	**BH01_16.0-16.45**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**B18-No36075**	**B18-No36076**	**B18-No36077**	**B18-No36078**
Date Sampled			**Not Provided**	**Not Provided**	**Not Provided**	**Not Provided**
Test/Reference	LOR	Unit				
Chromium Suite						
pH-KCL	0.1	pH Units	5.8	9.0	9.2	5.5
Acid trail - Titratable Actual Acidity	2	mol H+/t	3.0	< 2	< 2	7.0
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02	< 0.02	< 0.02
Chromium Reducible Sulfur^{S04}	0.005	% S	< 0.005	0.34	0.16	0.050
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	210	97	31
Sulfur - KCl Extractable	0.02	% S	< 0.02	0.05	0.04	< 0.02
HCl Extractable Sulfur	0.02	% S	n/a	n/a	n/a	n/a
Net Acid soluble sulfur	0.02	% S	n/a	n/a	n/a	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	n/a	n/a	n/a
Net Acid soluble sulfur - equivalent S% pyrite^{S02}	0.02	% S	n/a	n/a	n/a	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	n/a	2.5	1.2	n/a
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	n/a	500	250	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)^{S03}	0.02	% S	n/a	0.81	0.40	n/a
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	< 0.02	< 0.02	0.06
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	< 10	< 10	< 10	38
CRS Suite - Liming Rate^{S01}	1	kg CaCO3/t	< 1	< 1	< 1	2.9
Extraneous Material						
<2mm Fraction	0.005	g	42	49	39	40
>2mm Fraction	0.005	g	< 0.005	0.10	1.4	< 0.005
Analysed Material	0.1	%	100	100	96	100
Extraneous Material	0.1	%	< 0.1	0.2	3.5	< 0.1
% Moisture	1	%	3.9	23	20	15

Client Sample ID			**BH04_0.5-0.95**	**BH04_2.0-2.45**	**BH05_1.5-1.95**
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**B18-No36079**	**B18-No36080**	**B18-No36081**
Date Sampled			**Not Provided**	**Not Provided**	**Not Provided**
Test/Reference	LOR	Unit			
SPOCAS Suite					
pH-KCL	0.1	pH Units	6.7	5.7	5.7
pH-OX	0.1	pH Units	4.9	4.4	4.9
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2	3.0	3.0
Acid trail - Titratable Peroxide Acidity	2	mol H+/t	< 2	< 2	< 2
Acid trail - Titratable Sulfidic Acidity	2	mol H+/t	< 2	< 2	< 2
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02	< 0.02
sulfidic - TPA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02	< 0.02
sulfidic - TSA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02	< 0.02
Sulfur - KCl Extractable	0.02	% S	< 0.02	< 0.02	< 0.02
Sulfur - Peroxide	0.02	% S	< 0.02	< 0.02	< 0.02
Sulfur - Peroxide Oxidisable Sulfur	0.02	% S	< 0.02	< 0.02	< 0.02
acidity - Peroxide Oxidisable Sulfur	10	mol H+/t	< 10	< 10	< 10
HCl Extractable Sulfur	0.02	% S	n/a	n/a	n/a
Net Acid soluble sulfur	0.02	% S	n/a	n/a	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	n/a	n/a
Net Acid soluble sulfur - equivalent S% pyrite^{S02}	0.02	% S	n/a	n/a	n/a

Client Sample ID			**BH04_0.5-0.95**	**BH04_2.0-2.45**	**BH05_1.5-1.95**
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**B18-No36079**	**B18-No36080**	**B18-No36081**
Date Sampled			**Not Provided**	**Not Provided**	**Not Provided**
Test/Reference	LOR	Unit			
SPOCAS Suite					
Calcium - KCl Extractable	0.02	% Ca	< 0.02	< 0.02	< 0.02
Calcium - Peroxide	0.02	% Ca	< 0.02	< 0.02	< 0.02
Acid Reacted Calcium	0.02	% Ca	< 0.02	< 0.02	< 0.02
acidity - Acid Reacted Calcium	10	mol H+/t	< 10	< 10	< 10
sulfidic - Acid Reacted Ca equiv. S% pyrite	0.02	% S	< 0.02	< 0.02	< 0.02
Magnesium - KCl Extractable	0.02	% Mg	< 0.02	< 0.02	< 0.02
Magnesium - Peroxide	0.02	% Mg	< 0.02	< 0.02	< 0.02
Acid Reacted Magnesium	0.02	% Mg	< 0.02	< 0.02	< 0.02
acidity - Acid Reacted Magnesium	10	mol H+/t	< 10	< 10	< 10
sulfidic - Acid Reacted Mg equiv. S% pyrite	0.02	% S	< 0.02	< 0.02	< 0.02
Acid Neutralising Capacity (ANCE)	0.02	%CaCO3	n/a	n/a	n/a
Acid Neutralising Capacity - Acidity units (a-ANCE)	10	mol H+/t	n/a	n/a	n/a
Acid Neutralising Capacity - equivalent S% pyrite(s-ANCE)	0.02	% S	n/a	n/a	n/a
ANC Fineness Factor		factor	1.5	1.5	1.5
SPOCAS - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	< 0.02	< 0.02
SPOCAS - Net Acidity (Acidity Units)	10	mol H+/t	< 10	< 10	< 10
SPOCAS - Liming rate	1	kg CaCO3/t	< 1	< 1	< 1
Chromium Suite					
pH-KCL	0.1	pH Units	6.7	5.7	5.7
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2	3.0	3.0
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02	< 0.02	< 0.02
Chromium Reducible Sulfur^{S04}	0.005	% S	< 0.005	< 0.005	< 0.005
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	< 3	< 3
Sulfur - KCl Extractable	0.02	% S	< 0.02	< 0.02	< 0.02
HCl Extractable Sulfur	0.02	% S	n/a	n/a	n/a
Net Acid soluble sulfur	0.02	% S	n/a	n/a	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	n/a	n/a
Net Acid soluble sulfur - equivalent S% pyrite^{S02}	0.02	% S	n/a	n/a	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	0.28	n/a	n/a
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	56	n/a	n/a
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)^{S03}	0.02	% S	0.09	n/a	n/a
ANC Fineness Factor		factor	1.5	1.5	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	< 0.02	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	< 10	< 10	< 10
CRS Suite - Liming Rate^{S01}	1	kg CaCO3/t	< 1	< 1	< 1
Extraneous Material					
<2mm Fraction	0.005	g	41	51	46
>2mm Fraction	0.005	g	11	< 0.005	< 0.005
Analysed Material	0.1	%	78	100	100
Extraneous Material	0.1	%	22	< 0.1	< 0.1
% Moisture	1	%	< 1	< 1	3.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
SPOCAS Suite			
SPOCAS Suite	Brisbane	Nov 28, 2018	6 Week
- Method: LTM-GEN-7050			
Chromium Reducible Sulfur Suite			
Chromium Suite	Brisbane	Nov 28, 2018	6 Week
- Method: LTM-GEN-7070			
Extraneous Material	Brisbane	Nov 28, 2018	6 Week
- Method: LTM-GEN-7050/7070			
% Moisture	Brisbane	Nov 27, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: Cardno (NSW/ACT) Pty Ltd
Address: Level 9, 203 Pacific Highway
St Leonards
NSW 2065

Project Name: KYEEMAGH INFANTS SCHOOL
Project ID: 80818157

Order No.:
Report #: 629911
Phone: 0294967700
Fax: 02 9499 3902

Received: Nov 23, 2018 12:00 PM
Due: Nov 30, 2018
Priority: 5 Day
Contact Name: Ben Withnall

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						SPOCAS Suite	Chromium Reducible Sulfur Suite	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	BH01_1.0-1.45	Not Provided		Soil	B18-No36075	X	X	X
2	BH01_8.5-8.95	Not Provided		Soil	B18-No36076	X	X	X
3	BH01_10.0-10.45	Not Provided		Soil	B18-No36077	X	X	X
4	BH01_16.0-16.45	Not Provided		Soil	B18-No36078	X	X	X
5	BH04_0.5-0.95	Not Provided		Soil	B18-No36079	X	X	X
6	BH04_2.0-2.45	Not Provided		Soil	B18-No36080	X	X	X
7	BH05_1.5-1.95	Not Provided		Soil	B18-No36081	X	X	X
Test Counts						7	7	7

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ug/L:** micrograms per litre
ppm: Parts per million	**ppb:** Parts per billion	**%:** Percentage
org/100mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
SPOCAS Suite				Result 1	Result 2	RPD			
pH-KCL	B18-No36075	CP	pH Units	5.8	5.8	<1	30%	Pass	
pH-OX	B18-No36075	CP	pH Units	4.8	4.8	1.5	30%	Pass	
Acid trail - Titratable Actual Acidity	B18-No36075	CP	mol H+/t	3.0	3.0	1.6	30%	Pass	
Acid trail - Titratable Peroxide Acidity	B18-No36075	CP	mol H+/t	< 2	< 2	<1	30%	Pass	
Acid trail - Titratable Sulfidic Acidity	B18-No36075	CP	mol H+/t	< 2	< 2	<1	30%	Pass	
sulfidic - TAA equiv. S% pyrite	B18-No36075	CP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - TPA equiv. S% pyrite	B18-No36075	CP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
sulfidic - TSA equiv. S% pyrite	B18-No36075	CP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - KCl Extractable	B18-No36075	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide	B18-No36075	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Sulfur - Peroxide Oxidisable Sulfur	B18-No36075	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
acidity - Peroxide Oxidisable Sulfur	B18-No36075	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
HCl Extractable Sulfur	B18-No36075	CP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur	B18-No36075	CP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - acidity units	B18-No36075	CP	mol H+/t	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	B18-No36075	CP	% S	n/a	n/a	n/a	30%	Pass	
Calcium - KCl Extractable	B18-No36075	CP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
Calcium - Peroxide	B18-No36075	CP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
Acid Reacted Calcium	B18-No36075	CP	% Ca	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Calcium	B18-No36075	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Ca equiv. S% pyrite	B18-No36075	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - KCl Extractable	B18-No36075	CP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
Magnesium - Peroxide	B18-No36075	CP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
Acid Reacted Magnesium	B18-No36075	CP	% Mg	< 0.02	< 0.02	<1	30%	Pass	
acidity - Acid Reacted Magnesium	B18-No36075	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
sulfidic - Acid Reacted Mg equiv. S% pyrite	B18-No36075	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
Acid Neutralising Capacity (ANCE)	B18-No36075	CP	%CaCO3	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity - Acidity units (a-ANCE)	B18-No36075	CP	mol H+/t	n/a	n/a	n/a	30%	Pass	
ANC Fineness Factor	B18-No36075	CP	factor	1.5	1.5	<1	30%	Pass	
SPOCAS - Net Acidity (Sulfur Units)	B18-No36075	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
SPOCAS - Net Acidity (Acidity Units)	B18-No36075	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
SPOCAS - Liming rate	B18-No36075	CP	kg CaCO3/t	< 1	< 1	<1	30%	Pass	
Duplicate									
Chromium Suite				Result 1	Result 2	RPD			
Chromium Reducible Sulfur	B18-No36075	CP	% S	< 0.005	< 0.005	<1	30%	Pass	
Chromium Reducible Sulfur -acidity units	B18-No36075	CP	mol H+/t	< 3	< 3	<1	30%	Pass	
Acid Neutralising Capacity (ANCbt)	B18-No36075	CP	%CaCO3	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B18-No36075	CP	% S	n/a	n/a	n/a	30%	Pass	
CRS Suite - Net Acidity (Sulfur Units)	B18-No36075	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
CRS Suite - Net Acidity (Acidity Units)	B18-No36075	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
CRS Suite - Liming Rate	B18-No36075	CP	kg CaCO3/t	< 1	< 1	<1	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B18-Oc34425	NCP	%	14	15	7.0	30%	Pass	

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
S01	Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO3) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m3 in-situ soil' multiply 'reported results' x 'wet bulk density of soil in t/m3'
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5
S03	Acid Neutralising Capacity is only required if the pHKCl if greater than or equal to pH 6.5
S04	Acid Sulfate Soil Samples have a 24 hour holding time unless frozen or dried within that period

Authorised By

Nibha Vaidya	Analytical Services Manager
Myles Clark	Senior Analyst-SPOCAS (QLD)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Enviro Sample Bris

From:	Nibha Vaidya
Sent:	Friday, 23 November 2018 10:28 AM
To:	Enviro Sample Bris
Subject:	5 DAY TAT - FW: 62789 Acid Sulfate Request
Attachments:	80818157_101118_Soil_CRS_COC.xlsx
Follow Up Flag:	Follow up
Flag Status:	Flagged
Categories:	Printed - awaiting completion

23/11/18
12:00pm

Kind Regards,

Nibha Vaidya
Phone : +61 2 9900 8415
Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

From: Ben Withnall [mailto:ben.withnall@cardno.com.au]
Sent: Friday, 23 November 2018 9:48 AM
To: Nibha Vaidya
Cc: Joel Griffiths
Subject: 62789 Acid Sulfate Request

EXTERNAL EMAIL*

Hi Nibha,

Happy Friday! For lab report 627289 for our job 80818157 Kyeemagh I've attached an additional analysis request for SPOCAS and CRS on some samples we had pHFOX done on.

Thanks very much.

Ben Withnall
ENVIRONMENTAL SCIENTIST
CARDNO

Phone Fax +61 2 9439 5170 Direct +61 2 9495 8188
Address Level 9, The Forum, 203 Pacific Highway, St Leonards, New South Wales 2065 Australia

Email ben.withnall@cardno.com.au Web www.cardno.com

CONNECT WITH CARDNO

Cardno's management systems are certified to ISO9001 (quality) and AS4801/OHSAS18001 (occupational health and safety)

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Sample Receipt Advice

Company name:	**Cardno (NSW/ACT) Pty Ltd**
Contact name:	Ben Withnall
Project name:	KYEEMAGH INFANTS SCHOOL
Project ID:	80818157
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Nov 23, 2018 12:00 PM
Eurofins | mgt reference:	**629911**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Ben Withnall - ben.withnall@cardno.com.au.

Note: A copy of these results will also be delivered to the general Cardno (NSW/ACT) Pty Ltd email address.

Certificate of Analysis

Cardno (NSW/ACT) Pty Ltd
Level 9, 203 Pacific Highway
St Leonards
NSW 2065

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Ben Withnall**

Report **629653-W**
Project name KYEEMAGH INFANTS SCHOOL
Project ID 80818157
Received Date Nov 23, 2018

Client Sample ID			**MW01**	**MW02**	**MW03**	**QA100**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S18-No34063**	**S18-No34064**	**S18-No34065**	**S18-No34066**
Date Sampled			**Nov 23, 2018**	**Nov 23, 2018**	**Nov 23, 2018**	**Nov 23, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Volatile Organics						
1.1-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dibromoethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2.3-Trichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.4-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Butanone (MEK)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Propanone (Acetone)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
4-Chlorotoluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Allyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromodichloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromoform	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Carbon disulfide	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Carbon Tetrachloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**MW01** **Water** **S18-No34063** **Nov 23, 2018**	**MW02** **Water** **S18-No34064** **Nov 23, 2018**	**MW03** **Water** **S18-No34065** **Nov 23, 2018**	**QA100** **Water** **S18-No34066** **Nov 23, 2018**
Volatile Organics						
Chlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chloroform	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Chloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
cis-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dichlorodifluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Iodomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Methylene Chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Styrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Tetrachloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Trichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Trichlorofluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Vinyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
Total MAH*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
4-Bromofluorobenzene (surr.)	1	%	89	88	85	80
Toluene-d8 (surr.)	1	%	78	90	78	67
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			**MW01**	**MW02**	**MW03**	**QA100**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S18-No34063**	**S18-No34064**	**S18-No34065**	**S18-No34066**
Date Sampled			**Nov 23, 2018**	**Nov 23, 2018**	**Nov 23, 2018**	**Nov 23, 2018**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	72	67	71	77
p-Terphenyl-d14 (surr.)	1	%	84	73	76	84
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	103	107	109	107
13C5-PFPeA (surr.)	1	%	102	105	108	107
13C5-PFHxA (surr.)	1	%	120	123	122	123
13C4-PFHpA (surr.)	1	%	114	116	114	115
13C8-PFOA (surr.)	1	%	106	109	104	106
13C5-PFNA (surr.)	1	%	128	136	135	133
13C6-PFDA (surr.)	1	%	133	135	139	137
13C2-PFUnDA (surr.)	1	%	100	99	103	96
13C2-PFDoDA (surr.)	1	%	74	78	86	75
13C2-PFTeDA (surr.)	1	%	52	64	70	54
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	67	60	67	65
D3-N-MeFOSA (surr.)	1	%	INT	11	18	12
D5-N-EtFOSA (surr.)	1	%	INT	10	18	INT
D7-N-MeFOSE (surr.)	1	%	19	30	34	22
D9-N-EtFOSE (surr.)	1	%	18	29	31	22
D5-N-EtFOSAA (surr.)	1	%	38	61	51	45
D3-N-MeFOSAA (surr.)	1	%	33	57	42	42

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**MW01** **Water** **S18-No34063** **Nov 23, 2018**	**MW02** **Water** **S18-No34064** **Nov 23, 2018**	**MW03** **Water** **S18-No34065** **Nov 23, 2018**	**QA100** **Water** **S18-No34066** **Nov 23, 2018**
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)^{N11}	0.01	ug/L	^{N09}0.02	< 0.01	^{N09}0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	129	134	130	132
18O2-PFHxS (surr.)	1	%	128	130	127	129
13C8-PFOS (surr.)	1	%	128	125	127	130
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	105	106	104	105
13C2-6:2 FTSA (surr.)	1	%	137	140	132	133
13C2-8:2 FTSA (surr.)	1	%	165	162	174	164
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.02	< 0.01	0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.02	< 0.01	0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=28)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1
Heavy Metals						
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	0.002	< 0.001	0.002	< 0.001
Copper (filtered)	0.001	mg/L	0.002	< 0.001	0.001	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	< 0.001	0.001	0.004	0.002
Zinc (filtered)	0.005	mg/L	< 0.005	< 0.005	0.006	< 0.005

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	**Testing Site**	**Extracted**	**Holding Time**
Eurofins | mgt Suite B8 (filtered metals)			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Nov 26, 2018	7 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Volatile Organics	Sydney	Nov 26, 2018	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Nov 26, 2018	7 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Nov 26, 2018	7 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Nov 26, 2018	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8 filtered	Sydney	Nov 26, 2018	28 Day
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Nov 28, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Nov 28, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Nov 28, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Nov 28, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

Company Name:	Cardno (NSW/ACT) Pty Ltd	**Order No.:**		**Received:**	Nov 23, 2018 5:43 PM
Address:	Level 9, 203 Pacific Highway St Leonards NSW 2065	**Report #:**	629653	**Due:**	Nov 30, 2018
		Phone:	0294967700	**Priority:**	5 Day
		Fax:	02 9499 3902	**Contact Name:**	Ben Withnall
Project Name:	KYEEMAGH INFANTS SCHOOL				
Project ID:	80818157				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Eurofins | mgt Suite B8 (filtered metals)	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	
Brisbane Laboratory - NATA Site # 20794							X
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	MW01	Nov 23, 2018		Water	S18-No34063	X	X
2	MW02	Nov 23, 2018		Water	S18-No34064	X	X
3	MW03	Nov 23, 2018		Water	S18-No34065	X	X
4	QA100	Nov 23, 2018		Water	S18-No34066	X	X
Test Counts						4	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ug/L:** micrograms per litre
ppm: Parts per million	**ppb:** Parts per billion	**%:** Percentage
org/100mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
1.1.1-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.1.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dibromoethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.2-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.3-Trichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.4-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.3.5-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.4-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
2-Butanone (MEK)	mg/L	< 0.001			0.001	Pass	
2-Propanone (Acetone)	mg/L	< 0.001			0.001	Pass	
4-Chlorotoluene	mg/L	< 0.001			0.001	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.001			0.001	Pass	
Allyl chloride	mg/L	< 0.001			0.001	Pass	
Benzene	mg/L	< 0.001			0.001	Pass	
Bromobenzene	mg/L	< 0.001			0.001	Pass	
Bromochloromethane	mg/L	< 0.001			0.001	Pass	
Bromodichloromethane	mg/L	< 0.001			0.001	Pass	
Bromoform	mg/L	< 0.001			0.001	Pass	
Bromomethane	mg/L	< 0.001			0.001	Pass	
Carbon disulfide	mg/L	< 0.001			0.001	Pass	
Carbon Tetrachloride	mg/L	< 0.001			0.001	Pass	
Chlorobenzene	mg/L	< 0.001			0.001	Pass	
Chloroethane	mg/L	< 0.001			0.001	Pass	
Chloroform	mg/L	< 0.005			0.005	Pass	
Chloromethane	mg/L	< 0.001			0.001	Pass	
cis-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Dibromochloromethane	mg/L	< 0.001			0.001	Pass	
Dibromomethane	mg/L	< 0.001			0.001	Pass	
Dichlorodifluoromethane	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
Methylene Chloride	mg/L	< 0.001			0.001	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Styrene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Trichloroethene	mg/L	< 0.001			0.001	Pass	
Trichlorofluoromethane	mg/L	< 0.001			0.001	Pass	
Vinyl chloride	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/L	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	90			70-130	Pass	
TRH C10-C14	%	110			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	107			70-130	Pass	
1.1.1-Trichloroethane	%	93			70-130	Pass	
1.2-Dichlorobenzene	%	102			70-130	Pass	
1.2-Dichloroethane	%	96			70-130	Pass	
Benzene	%	94			70-130	Pass	
Ethylbenzene	%	104			70-130	Pass	
m&p-Xylenes	%	100			70-130	Pass	
o-Xylene	%	97			70-130	Pass	
Toluene	%	89			70-130	Pass	
Trichloroethene	%	88			70-130	Pass	
Xylenes - Total	%	99			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	102			70-130	Pass	
TRH C6-C10	%	90			70-130	Pass	
TRH >C10-C16	%	119			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	75			70-130	Pass	
Acenaphthylene	%	79			70-130	Pass	
Anthracene	%	85			70-130	Pass	
Benz(a)anthracene	%	87			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(a)pyrene	%	89			70-130	Pass	
Benzo(b&j)fluoranthene	%	89			70-130	Pass	
Benzo(g.h.i)perylene	%	93			70-130	Pass	
Benzo(k)fluoranthene	%	92			70-130	Pass	
Chrysene	%	90			70-130	Pass	
Dibenz(a.h)anthracene	%	85			70-130	Pass	
Fluoranthene	%	90			70-130	Pass	
Fluorene	%	79			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	93			70-130	Pass	
Naphthalene	%	72			70-130	Pass	
Phenanthrene	%	84			70-130	Pass	
Pyrene	%	89			70-130	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	108			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	118			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	107			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	128			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	113			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	118			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	117			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	93			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	117			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	111			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	124			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	126			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	125			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	82			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	125			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	122			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	113			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	72			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	115			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	115			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	105			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	118			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	105			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	113			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	121			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	126			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	131			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	124			50-150	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	102			70-130	Pass	
Cadmium (filtered)	%	102			70-130	Pass	
Chromium (filtered)	%	101			70-130	Pass	
Copper (filtered)	%	100			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Lead (filtered)			%	101			70-130	Pass	
Mercury (filtered)			%	101			70-130	Pass	
Nickel (filtered)			%	101			70-130	Pass	
Zinc (filtered)			%	100			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M18-No39789	NCP	%	107			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M18-No39789	NCP	%	109			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M18-No39789	NCP	%	97			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-No39789	NCP	%	117			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M18-No39789	NCP	%	109			50-150	Pass	
Perfluorononanoic acid (PFNA)	M18-No39789	NCP	%	118			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M18-No39789	NCP	%	109			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-No39789	NCP	%	84			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-No39789	NCP	%	113			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-No39789	NCP	%	79			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-No39789	NCP	%	98			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M18-No39789	NCP	%	113			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-No39789	NCP	%	118			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-No39789	NCP	%	77			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-No39789	NCP	%	136			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-No39789	NCP	%	121			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-No39789	NCP	%	89			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-No39789	NCP	%	114			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M18-No39789	NCP	%	101			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-No39789	NCP	%	113			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-No39789	NCP	%	107			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-No39789	NCP	%	115			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-No39789	NCP	%	85			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-No39789	NCP	%	83			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-No39789	NCP	%	117			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-No39789	NCP	%	122			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-No39789	NCP	%	142			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-No39789	NCP	%	123			50-150	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Mercury (filtered)	M18-No28785	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S18-No34065	CP	%	83			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
Benzene	S18-No34065	CP	%	84			70-130	Pass	
Ethylbenzene	S18-No34065	CP	%	82			70-130	Pass	
m&p-Xylenes	S18-No34065	CP	%	83			70-130	Pass	
o-Xylene	S18-No34065	CP	%	83			70-130	Pass	
Toluene	S18-No34065	CP	%	81			70-130	Pass	
Xylenes - Total	S18-No34065	CP	%	83			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S18-No34065	CP	%	73			70-130	Pass	
TRH C6-C10	S18-No34065	CP	%	81			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	S18-No34066	CP	%	103			70-130	Pass	
Cadmium (filtered)	S18-No34066	CP	%	103			70-130	Pass	
Chromium (filtered)	S18-No34066	CP	%	104			70-130	Pass	
Copper (filtered)	S18-No34066	CP	%	101			70-130	Pass	
Lead (filtered)	S18-No34066	CP	%	95			70-130	Pass	
Nickel (filtered)	S18-No34066	CP	%	100			70-130	Pass	
Zinc (filtered)	S18-No34066	CP	%	99			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B18-No35802	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B18-No35802	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B18-No35802	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-No35802	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B18-No35802	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B18-No35802	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B18-No35802	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-No35802	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-No35802	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-No35802	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B18-No35802	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B18-No35802	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-No35802	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-No35802	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-No35802	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-No35802	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-No35802	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-No35802	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B18-No35802	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B18-No35802	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B18-No35802	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B18-No35802	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B18-No35802	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B18-No35802	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B18-No35802	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-No35802	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-No35802	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-No35802	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Chromium (filtered)	S18-No34063	CP	mg/L	0.002	0.002	1.0	30%	Pass	
Copper (filtered)	S18-No34063	CP	mg/L	0.002	0.002	12	30%	Pass	
Lead (filtered)	M18-No28784	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	S18-No34063	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	S18-No34063	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc (filtered)	S18-No34063	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised By

Nibha Vaidya	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Jonathon Angell	Senior Analyst-Organic (QLD)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Cardno
Shaping the Future

CHAIN OF CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

629653

Contact Person:	Ben Withnall
Telephone Number:	9495 8188
Alternative Contact:	Joel Griffiths
Telephone Number:	9496 7873
Sampler:	Joel Griffiths
Email Address (results and invoice):	ben.withnall@cardno.com.au; joel.griffiths@cardno.com.au
Address:	Level 9 - The Forum, 203 Pacific Highway, St Leonards, New South Wales 2065

Project Name:	Kyeemagh Infants School
Project Number:	80818157
PO No.:	
Project Specific Quote No. :	181029CAR_1
Date results required:	Standard TAT
Report format:	Electronic

Sample Information						Analysis Required		Comments
Cardno Sample ID	**Laboratory Sample ID**	**No. Containers**	**Preservation**	**Date sampled**	**Matrix**	B8*1 TRH, VOC, PAH, Metals (8)	28 PFAS including PFOA/PFOS and 6:2 FTS	
MW01		5	Ice	23/11/2018	Water	X	X	
MW02		5	Ice	23/11/2018	Water	X	X	
MW03		5	Ice	23/11/2018	Water	X	X	
QA100		5	Ice	23/11/2018	Water	X	X	
QA200		5	Ice	23/11/2018	Water	X	X	Please send to ALS

Relinquished by: Joel Griffiths
(name / company) Cardno
Date & Time: 23/11/18: 16:30
Signature: JG

Received by: WONG
(name / company)
Date & Time: 26/11 9:25am
Signature:

Relinquished by:
(name / company
Date & Time:
Signature:

Received by:
(name / company)
Date & Time:
Signature:

Relinquished by:
(name / company)
Date & Time:
Signature:

Received by:
(name / company)
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Date & Time:
Signature:

Received by:
(name / company
Date & Time:
Signature:

Relinquished by:
(name / company)
Date & Time:
Signature:

Lab use:
Samples Received: [✓ Cool] or Ambient (circle one)
Temperature Received at: 2.5 (if applicable)
Transported by: Hand delivered / [✓ courier]

Sample Receipt Advice

Company name:	**Cardno (NSW/ACT) Pty Ltd**
Contact name:	Ben Withnall
Project name:	KYEEMAGH INFANTS SCHOOL
Project ID:	80818157
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Nov 23, 2018 5:43 PM
Eurofins | mgt reference:	**629653**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☑ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

QA200 forwarded to ALS

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Ben Withnall - ben.withnall@cardno.com.au.

Note: A copy of these results will also be delivered to the general Cardno (NSW/ACT) Pty Ltd email address.

CERTIFICATE OF ANALYSIS

Work Order	: **ES1835239**	Page	: 1 of 9
Client	: **CARDNO (NSW/ACT) PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WITHNALL	Contact	: Customer Services ES
Address	: Level 9 The Forum 203 Pacific Highway St Leonards NSW 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 2 9495 8188	Telephone	: +61-2-8784 8555
Project	: KYEEMAGH INFANTS SCHOOL 80818157	Date Samples Received	: 26-Nov-2018 14:55
Order number	:	Date Analysis Commenced	: 27-Nov-2018
C-O-C number	: ----	Issue Date	: 03-Dec-2018 10:39
Sampler	: JOEL GRIFFITHS		
Site	: ----		
Quote number	: EN/222 - Secondary Work		
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
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini		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 sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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

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

- 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*	**QA200**	----	----	----	----
			Client sampling date / time	23-Nov-2018 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1835239-001**	--------	--------	--------	--------
				Result	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	**0.001**	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	**0.001**	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	5	µg/L	<5	----	----	----	----
Isopropylbenzene	98-82-8	5	µg/L	<5	----	----	----	----
n-Propylbenzene	103-65-1	5	µg/L	<5	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	----	----	----	----
sec-Butylbenzene	135-98-8	5	µg/L	<5	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	----	----	----	----
tert-Butylbenzene	98-06-6	5	µg/L	<5	----	----	----	----
p-Isopropyltoluene	99-87-6	5	µg/L	<5	----	----	----	----
n-Butylbenzene	104-51-8	5	µg/L	<5	----	----	----	----
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	50	µg/L	<50	----	----	----	----
2-Butanone (MEK)	78-93-3	50	µg/L	<50	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	----	----	----	----
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	----	----	----	----
EP074C: Sulfonated Compounds								
Carbon disulfide	75-15-0	5	µg/L	<5	----	----	----	----
EP074D: Fumigants								
2.2-Dichloropropane	594-20-7	5	µg/L	<5	----	----	----	----
1.2-Dichloropropane	78-87-5	5	µg/L	<5	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	----	----	----	----
1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	----	----	----	----
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**QA200**	----	----	----	----
			Client sampling date / time	23-Nov-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	**ES1835239-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP074E: Halogenated Aliphatic Compounds - Continued								
Chloromethane	74-87-3	50	µg/L	<50	----	----	----	----
Vinyl chloride	75-01-4	50	µg/L	<50	----	----	----	----
Bromomethane	74-83-9	50	µg/L	<50	----	----	----	----
Chloroethane	75-00-3	50	µg/L	<50	----	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L	<50	----	----	----	----
1.1-Dichloroethene	75-35-4	5	µg/L	<5	----	----	----	----
Iodomethane	74-88-4	5	µg/L	<5	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	----	----	----	----
1.1-Dichloroethane	75-34-3	5	µg/L	<5	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	----	----	----	----
1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	----	----	----	----
1.1-Dichloropropylene	563-58-6	5	µg/L	<5	----	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L	<5	----	----	----	----
1.2-Dichloroethane	107-06-2	5	µg/L	<5	----	----	----	----
Trichloroethene	79-01-6	5	µg/L	<5	----	----	----	----
Dibromomethane	74-95-3	5	µg/L	<5	----	----	----	----
1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	----	----	----	----
1.3-Dichloropropane	142-28-9	5	µg/L	<5	----	----	----	----
Tetrachloroethene	127-18-4	5	µg/L	<5	----	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	----	----	----	----
1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	----	----	----	----
Pentachloroethane	76-01-7	5	µg/L	<5	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	----	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L	<5	----	----	----	----
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	5	µg/L	<5	----	----	----	----
Bromobenzene	108-86-1	5	µg/L	<5	----	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L	<5	----	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L	<5	----	----	----	----
1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	----	----	----	----
1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	----	----	----	----
1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	----	----	----	----

Analytical Results

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

			Client sample ID	**QA200**	----	----	----	----
			Client sampling date / time	23-Nov-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	**ES1835239-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP074F: Halogenated Aromatic Compounds - Continued								
1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	----	----	----	----
1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	----	----	----	----
EP074G: Trihalomethanes								
Chloroform	67-66-3	5	µg/L	<5	----	----	----	----
Bromodichloromethane	75-27-4	5	µg/L	<5	----	----	----	----
Dibromochloromethane	124-48-1	5	µg/L	<5	----	----	----	----
Bromoform	75-25-2	5	µg/L	<5	----	----	----	----
EP074H: Naphthalene								
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	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	1.0	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	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	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**QA200**	----	----	----	----
			Client sampling date / time	23-Nov-2018 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1835239-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ **Total Xylenes**	----	2	µg/L	<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**QA200**	**----**	**----**	**----**	**----**
			Client sampling date / time	23-Nov-2018 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1835239-001**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued								
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**QA200**	----	----	----	----
			Client sampling date / time	23-Nov-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	**ES1835239-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	----	----	----	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	5	%	**124**	----	----	----	----
Toluene-D8	2037-26-5	5	%	**98.4**	----	----	----	----
4-Bromofluorobenzene	460-00-4	5	%	**99.1**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1.0	%	**19.9**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%	**42.7**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%	**51.9**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1.0	%	**78.0**	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%	**70.7**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%	**92.3**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**125**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**95.3**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**92.4**	----	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**97.6**	----	----	----	----
13C8-PFOA	----	0.02	%	**116**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*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
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

QUALITY CONTROL REPORT

Work Order	: **ES1835239**	Page	: 1 of 16
Client	: **CARDNO (NSW/ACT) PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WITHNALL	Contact	: Customer Services ES
Address	: Level 9 The Forum 203 Pacific Highway St Leonards NSW 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 2 9495 8188	Telephone	: +61-2-8784 8555
Project	: KYEEMAGH INFANTS SCHOOL 80818157	Date Samples Received	: 26-Nov-2018
Order number	:	Date Analysis Commenced	: 27-Nov-2018
C-O-C number	: ----	Issue Date	: 03-Dec-2018
Sampler	: JOEL GRIFFITHS		
Site	: ----		
Quote number	: EN/222 - Secondary Work		
No. of samples received	: 1		
No. of samples analysed	: 1		

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 Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Franco Lentini		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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2061594)									
ES1835399-007	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.003	0.004	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.006	0.006	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.006	0.006	0.00	No Limit
ES1835387-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.008	0.008	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 2061595)									
ES1835387-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 2062578)									
ES1835399-007	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.00	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 2062578) - continued									
ES1835399-007	Anonymous	EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.00	No Limit
ES1835239-001	QA200	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.00	No Limit
EP074B: Oxygenated Compounds (QC Lot: 2062578)									
ES1835399-007	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.00	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.00	No Limit
ES1835239-001	QA200	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.00	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 2062578)									
ES1835399-007	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.00	No Limit
ES1835239-001	QA200	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.00	No Limit
EP074D: Fumigants (QC Lot: 2062578)									
ES1835399-007	Anonymous	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.00	No Limit
ES1835239-001	QA200	EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 2062578)									
ES1835399-007	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 2062578) - continued									
ES1835399-007	Anonymous	EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.00	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.00	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.00	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.00	No Limit
ES1835239-001	QA200	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 2062578) - continued									
ES1835239-001	QA200	EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.00	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.00	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.00	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 2062578)									
ES1835399-007	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.00	No Limit
ES1835239-001	QA200	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 2062578)									
ES1835399-007	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.00	No Limit
ES1835239-001	QA200	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074H: Naphthalene (QC Lot: 2062578)									
ES1835399-007	Anonymous	EP074: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
ES1835239-001	QA200	EP074: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2058890)									
ES1835207-001	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	<1.0	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2058891)									
ES1835207-001	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2062577)									
ES1835239-001	QA200	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2058891)									
ES1835207-001	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2062577)									
ES1835239-001	QA200	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 2062577)									
ES1835239-001	QA200	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 2062577) - continued									
ES1835239-001	QA200	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 2062581)									
EM1818839-069	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
ES1835368-003	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.09	0.10	0.00	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.08	0.07	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.05	0.06	20.6	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	1.10	1.09	0.00	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 2062581)									
EM1818839-069	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
ES1835368-003	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.02	0.02	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.03	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.16	0.16	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 2062581)									
EM1818839-069	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 2062581) - continued									
EM1818839-069	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ES1835368-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 2062581)									
EM1818839-069	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ES1835368-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 2062581) - continued									
ES1835368-003	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 2062581)									
EM1818839-069	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.00	No Limit
ES1835368-003	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	1.53	1.52	0.656	0% - 20%

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 2061594)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	102	85	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	99.8	84	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	101	85	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	101	81	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	98.3	83	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	101	82	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	102	81	117
EG035F: Dissolved Mercury by FIMS (QCLot: 2061595)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	90.8	83	105
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2062578)								
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	92.9	73	119
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	10 µg/L	103	76	118
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	10 µg/L	99.6	69	119
EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	10 µg/L	98.9	74	116
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	10 µg/L	102	73	119
EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	10 µg/L	97.2	74	116
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	10 µg/L	101	72	116
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	10 µg/L	93.8	71	119
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	10 µg/L	98.6	65	123
EP074B: Oxygenated Compounds (QCLot: 2062578)								
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	100 µg/L	87.7	61	134
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	100 µg/L	102	74	130
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	100 µg/L	100	66	132
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	100 µg/L	99.8	65	137
EP074C: Sulfonated Compounds (QCLot: 2062578)								
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	10 µg/L	95.6	73	127
EP074D: Fumigants (QCLot: 2062578)								
EP074: 2.2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	102	68	122
EP074: 1.2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	103	76	118
EP074: cis-1.3-Dichloropropylene	10061-01-5	5	µg/L	<5	10 µg/L	97.8	62	120
EP074: trans-1.3-Dichloropropylene	10061-02-6	5	µg/L	<5	10 µg/L	96.2	60	114
EP074: 1.2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	102	69	117
EP074E: Halogenated Aliphatic Compounds (QCLot: 2062578)								

Sub-Matrix: **WATER**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Recovery Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP074E: Halogenated Aliphatic Compounds (QCLot: 2062578) - continued								
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	92.9	61	138
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	99.7	67	130
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	104	69	129
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	99.3	56	140
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	100	61	139
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	103	69	131
EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	103	70	124
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	71.6	70	128
EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	105	74	118
EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	102	74	120
EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	102	77	119
EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	105	67	119
EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	103	73	119
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	10 µg/L	102	62	120
EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	102	73	123
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	102	76	118
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	101	73	119
EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	99.4	72	126
EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	107	71	129
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	102	72	124
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	10 µg/L	99.0	66	114
EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	86.7	60	120
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	94.9	71	128
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	101	70	124
EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	101	74	126
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	97.5	72	126
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	92.6	66	136
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	98.5	58	130
EP074F: Halogenated Aromatic Compounds (QCLot: 2062578)								
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	103	79	117
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	99.9	76	116
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	101	73	119
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	100	73	119
EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	95.8	75	117
EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	98.5	74	118
EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	98.8	75	117
EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	95.1	61	125
EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	95.8	67	123
EP074G: Trihalomethanes (QCLot: 2062578)								

Sub-Matrix: **WATER**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Recovery Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP074G: Trihalomethanes (QCLot: 2062578) - continued								
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	103	72	120
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	96.0	64	118
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	93.2	65	115
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	89.0	74	126
EP074H: Naphthalene (QCLot: 2062578)								
EP074: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	101	72	122
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2058890)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	76.9	50	94
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	95.1	64	114
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	93.7	62	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	87.5	64	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	70.0	63	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	86.7	64	116
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	100.0	64	118
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	90.1	63	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	91.4	64	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	93.1	63	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	73.6	62	119
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	94.0	63	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	83.0	63	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	78.4	60	118
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	85.7	61	117
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	84.5	59	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2058891)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	89.8	76	116
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	100	83	109
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	85.9	75	113
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2062577)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	82.6	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2058891)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	2500 µg/L	94.0	76	114
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	87.3	81	111
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1500 µg/L	103	77	119
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2062577)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	87.5	75	127
EP080: BTEXN (QCLot: 2062577)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	93.1	70	122

Sub-Matrix: **WATER**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Recovery Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP080: BTEXN (QCLot: 2062577) - continued								
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	87.4	69	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	88.2	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	87.1	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	91.4	72	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	96.8	70	120
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 2062581)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.5 µg/L	90.2	70	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.5 µg/L	97.4	70	130
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.5 µg/L	103	70	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.5 µg/L	107	70	130
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.5 µg/L	102	70	130
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.5 µg/L	104	70	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 2062581)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	2.5 µg/L	103	70	130
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.5 µg/L	103	70	130
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.5 µg/L	112	70	130
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.5 µg/L	119	70	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.5 µg/L	111	70	130
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.5 µg/L	110	70	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.5 µg/L	110	70	130
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.5 µg/L	113	70	130
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.5 µg/L	113	70	130
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.5 µg/L	101	70	130
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	1.25 µg/L	110	70	150
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 2062581)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.5 µg/L	96.0	70	130
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	1.25 µg/L	118	70	150
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	1.25 µg/L	112	70	150
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	1.25 µg/L	114	70	150
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	1.25 µg/L	114	70	150
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.5 µg/L	99.2	70	130
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.5 µg/L	106	70	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 2062581)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.5 µg/L	114	70	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 2062581) - continued								
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.5 µg/L	107	70	130
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.5 µg/L	119	70	130
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.5 µg/L	94.2	70	130

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
				Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 2061594)							
ES1835326-001	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	106	70	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	105	70	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	107	70	130
		EG020A-F: Copper	7440-50-8	1 mg/L	104	70	130
		EG020A-F: Lead	7439-92-1	1 mg/L	104	70	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	106	70	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	107	70	130
EG035F: Dissolved Mercury by FIMS (QCLot: 2061595)							
ES1835239-001	QA200	EG035F: Mercury	7439-97-6	0.01 mg/L	87.6	70	130
EP074E: Halogenated Aliphatic Compounds (QCLot: 2062578)							
ES1835239-001	QA200	EP074: 1.1-Dichloroethene	75-35-4	25 µg/L	117	70	130
		EP074: Trichloroethene	79-01-6	25 µg/L	98.7	70	130
EP074F: Halogenated Aromatic Compounds (QCLot: 2062578)							
ES1835239-001	QA200	EP074: Chlorobenzene	108-90-7	25 µg/L	97.7	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2058890)							
ES1835207-004	Anonymous	EP075(SIM): Acenaphthene	83-32-9	20 µg/L	77.0	70	130
		EP075(SIM): Pyrene	129-00-0	20 µg/L	87.5	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2058891)							
ES1835207-004	Anonymous	EP071: C10 - C14 Fraction	----	200 µg/L	109	74	150
		EP071: C15 - C28 Fraction	----	300 µg/L	114	77	153
		EP071: C29 - C36 Fraction	----	200 µg/L	123	67	153
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2062577)							
ES1835239-001	QA200	EP080: C6 - C9 Fraction	----	325 µg/L	98.3	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2058891)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	*SpikeRecovery(%)*	*Recovery Limits (%)*	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2058891) - continued							
ES1835207-004	Anonymous	EP071: >C10 - C16 Fraction	----	250 µg/L	110	74	150
		EP071: >C16 - C34 Fraction	----	350 µg/L	109	77	153
		EP071: >C34 - C40 Fraction	----	150 µg/L	111	67	153
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2062577)							
ES1835239-001	QA200	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	111	70	130
EP080: BTEXN (QCLot: 2062577)							
ES1835239-001	QA200	EP080: Benzene	71-43-2	25 µg/L	106	70	130
		EP080: Toluene	108-88-3	25 µg/L	95.8	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	95.2	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	93.9	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	97.2	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	91.8	70	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 2062581)							
EM1818839-069	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.5 µg/L	80.6	50	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.5 µg/L	93.0	50	130
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.5 µg/L	110	50	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.5 µg/L	102	50	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.5 µg/L	95.4	50	130
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.5 µg/L	97.8	50	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 2062581)							
EM1818839-069	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	2.5 µg/L	97.8	50	130
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.5 µg/L	103	50	130
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.5 µg/L	96.4	50	130
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.5 µg/L	114	50	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.5 µg/L	102	50	130
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.5 µg/L	110	50	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.5 µg/L	93.6	50	130
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.5 µg/L	108	50	130
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.5 µg/L	98.6	50	130
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.5 µg/L	88.8	50	130
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	1.25 µg/L	105	50	150
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 2062581)							
EM1818839-069	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.5 µg/L	82.2	50	130
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	1.25 µg/L	107	50	150
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	1.25 µg/L	103	50	150

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 2062581) - continued							
EM1818839-069	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	1.25 µg/L	114	50	150
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	1.25 µg/L	118	50	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.5 µg/L	97.4	50	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.5 µg/L	81.8	50	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 2062581)							
EM1818839-069	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.5 µg/L	117	50	130
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.5 µg/L	104	50	130
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.5 µg/L	115	50	130
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.5 µg/L	90.0	50	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1835239**	Page	: 1 of 6
Client	: **CARDNO (NSW/ACT) PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WITHNALL	Telephone	: +61-2-8784 8555
Project	: KYEEMAGH INFANTS SCHOOL 80818157	Date Samples Received	: 26-Nov-2018
Site	: ----	Issue Date	: 03-Dec-2018
Sampler	: JOEL GRIFFITHS	No. of samples received	: 1
Order number	:	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

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

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
***Container** / Client Sample ID(s)*		***Date extracted***	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) QA200	**23-Nov-2018**	**----**	----	----	**28-Nov-2018**	22-May-2019	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) QA200	**23-Nov-2018**	**----**	----	----	**29-Nov-2018**	21-Dec-2018	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Clear glass VOC vial - HCl (EP074) QA200	**23-Nov-2018**	**29-Nov-2018**	07-Dec-2018	✓	**29-Nov-2018**	07-Dec-2018	✓
EP074B: Oxygenated Compounds							
Clear glass VOC vial - HCl (EP074) QA200	**23-Nov-2018**	**29-Nov-2018**	07-Dec-2018	✓	**29-Nov-2018**	07-Dec-2018	✓
EP074C: Sulfonated Compounds							
Clear glass VOC vial - HCl (EP074) QA200	**23-Nov-2018**	**29-Nov-2018**	07-Dec-2018	✓	**29-Nov-2018**	07-Dec-2018	✓
EP074D: Fumigants							
Clear glass VOC vial - HCl (EP074) QA200	**23-Nov-2018**	**29-Nov-2018**	07-Dec-2018	✓	**29-Nov-2018**	07-Dec-2018	✓
EP074E: Halogenated Aliphatic Compounds							
Clear glass VOC vial - HCl (EP074) QA200	**23-Nov-2018**	**29-Nov-2018**	07-Dec-2018	✓	**29-Nov-2018**	07-Dec-2018	✓
EP074F: Halogenated Aromatic Compounds							
Clear glass VOC vial - HCl (EP074) QA200	**23-Nov-2018**	**29-Nov-2018**	07-Dec-2018	✓	**29-Nov-2018**	07-Dec-2018	✓
EP074G: Trihalomethanes							
Clear glass VOC vial - HCl (EP074) QA200	**23-Nov-2018**	**29-Nov-2018**	07-Dec-2018	✓	**29-Nov-2018**	07-Dec-2018	✓
EP074H: Naphthalene							
Clear glass VOC vial - HCl (EP074) QA200	**23-Nov-2018**	**29-Nov-2018**	07-Dec-2018	✓	**29-Nov-2018**	07-Dec-2018	✓

Matrix: **WATER**

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

Method ***Container** / Client Sample ID(s)*	***Sample Date***	*Extraction / Preparation* ***Date extracted***	 *Due for extraction*	 *Evaluation*	*Analysis* ***Date analysed***	 *Due for analysis*	 *Evaluation*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) QA200	**23-Nov-2018**	**27-Nov-2018**	30-Nov-2018	✓	**29-Nov-2018**	06-Jan-2019	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) QA200	**23-Nov-2018**	**27-Nov-2018**	30-Nov-2018	✓	**28-Nov-2018**	06-Jan-2019	✓
Clear glass VOC vial - HCl (EP080) QA200	**23-Nov-2018**	**29-Nov-2018**	07-Dec-2018	✓	**29-Nov-2018**	07-Dec-2018	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) QA200	**23-Nov-2018**	**27-Nov-2018**	30-Nov-2018	✓	**28-Nov-2018**	06-Jan-2019	✓
Clear glass VOC vial - HCl (EP080) QA200	**23-Nov-2018**	**29-Nov-2018**	07-Dec-2018	✓	**29-Nov-2018**	07-Dec-2018	✓
EP080: BTEXN							
Clear glass VOC vial - HCl (EP080) QA200	**23-Nov-2018**	**29-Nov-2018**	07-Dec-2018	✓	**29-Nov-2018**	07-Dec-2018	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) QA200	**23-Nov-2018**	**28-Nov-2018**	22-May-2019	✓	**29-Nov-2018**	22-May-2019	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) QA200	**23-Nov-2018**	**28-Nov-2018**	22-May-2019	✓	**29-Nov-2018**	22-May-2019	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) QA200	**23-Nov-2018**	**28-Nov-2018**	22-May-2019	✓	**29-Nov-2018**	22-May-2019	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) QA200	**23-Nov-2018**	**28-Nov-2018**	22-May-2019	✓	**29-Nov-2018**	22-May-2019	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) QA200	**23-Nov-2018**	**28-Nov-2018**	22-May-2019	✓	**29-Nov-2018**	22-May-2019	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
Volatile Organic Compounds	EP074	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In house: Direct injection analysis of fresh waters after dilution (1:1) with methanol. Analysis by LC-Electrospray-MS-MS, Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. This method complies with the quality control definitions as stated in QSM 5.1. Data is reviewed in line with the DQOs as stated in QSM5.1

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Preparation for PFAS in water.	EP231-PR	WATER	Method presumes direct injection without workup. Preparation includes addition of internal standard and surrogate, and filtration prior to anaylsis.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

APPENDIX

G

QA/QC REPORT

Quality Control / Quality Assurance Report

Quality Assurance/Quality Control (QA/QC) procedures were implemented to ensure the precision accuracy, representativeness, completeness and comparability of all data gathered. The QA/QC procedures included:

- Equipment calibration to ensure field measurements obtained are accurate;
- Equipment decontamination to prevent cross contamination;
- The completion of a log for each soil bore;
- Use of appropriate measures (i.e. gloves) to prevent cross contamination;
- Appropriate sample identification;
- Collection and analysis of duplicate samples for QA/QC purposes;
- Correct sample preservation;
- Sample transport with Chain of Custody (COC) documentation; and
- Laboratory analysis in accordance with NATA accredited methods.

Table G-1 details the QA/QC procedures and sample collection details undertaken through the elements of the investigation. **Table G-2** summarises the number of QA/QC samples collected during this investigation. Copies of all the COCs, along with the Sample Receipt Notifications (SRNs), Interpretive QA/QC Reports are provided in **Appendix F**.

Table G-1 Field QA/QC Method Validation

Requirement	Yes/No	Comments
Equipment calibration	Yes	Calibration certificates are presented at the end of this Appendix.
Equipment decontamination	Yes	Decontamination of sampling equipment (hand auger and solid flight) was undertaken by washing with phosphate free detergent (Liquinox) followed by a rinse with potable water.
Soil logging	Yes	All intrusive locations and soil samples collected were logged in accordance with the Unified Soil Classification System. Borehole logs provided in **Appendix E**.
Sample collection	Yes	Samples were collected using disposable nitrile gloves and placed directly into appropriate sample jars and resealable bags provided by the laboratory. A clean pair of gloves was used for each new sample being collected to limit the possibility of cross-contamination.
Sample identification	Yes	All samples were marked with a unique identifier including project number, sample location, depth and date.
QA/QC sample collection	Yes	Two soil duplicate samples were collected for intra-lab QA/QC purposes with a further two triplicate soil samples collected to monitor the quality of the field practices for sample collection. Cardno based the investigation around a rate of one duplicate sample per 20 primary samples as the requirement for duplicate sample collection.
Sample preservation	Yes	Samples were placed in a chilled ice box with ice for storage and transport to the laboratory. Samples for ASS analysis were frozen following field works.
COC documentation	Yes	A COC form was completed by Cardno detailing sample identification, collection date, sampler and laboratory analysis required. The COC form was signed off and returned to Cardno by the laboratory staff upon receipt of all the samples. COC forms and Sample Receipt Notification (SRN) are provided in **Appendix F**. The SRN indicates that the samples were received at the laboratory intact and chilled and within the required holding times. Outliers present on the SRNs were addressed with the laboratory.
NATA accredited methods	Yes	Eurofins mgt, a NATA accredited laboratory analysed the samples in accordance with NATA accredited methods. Inter-lab QAQC samples were analysed at ALS Environmental Services. Analytical methods used are indicated in the stamped laboratory results provided in **Appendix F**.

Table G-2 Field QA/QC Collection Summary

Investigation Element	Date	Sample Type and Number of Samples					
		Primary	Duplicate	Split (Triplicate)	Trip blank	Field blank	Rinsate
Soil	10/11/2018 17/11/2018	41	2	2	1	1	1
Groundwater	23/11/2018	3	1	1	-	-	-

Relative Percentage Difference Determination

Laboratory results for duplicate and triplicate samples are assessed using a determination of the Relative Percentage Difference (RPD). Where a primary sample and a duplicate sample are compared, the RPD provides an indication of the reproducibility of the results, which incorporates the sampling method. Where a primary sample and a split sample are compared, the RPD provides an indication of the accuracy of the primary laboratory results as compared to the secondary laboratory result.

The calculation used to determine the RPD is:

$$RPD = \frac{(Co - Cs)}{\left(\frac{Co + Cs}{2}\right)} x100$$

Where:

Co = Concentration of the original sample

Cs = Concentration of the duplicate sample

In calculating the RPD values the following protocols were adopted:

- Where both concentrations are above laboratory reporting limits the RPD formula is used;
- Where both concentrations are below the laboratory reporting limits, no RPD is calculated; and
- Where one or both sample concentrations are reported to be less than ten times (<10x) the laboratory reporting limit, the RPD is calculated but is not assessed against the adopted criterion.

In accordance with the Australian Standard 4482.1-2005 (Standards Australia, 2005), Cardno adopts an RPD acceptance criterion up to 50% of the mean concentration of the analyte. It should be noted that variations might be higher for organic analysis, due to the volatile nature of the components, and for low concentrations of analytes.

The adopted criterion will not apply to RPDs where one or both concentrations are less than 10 times the reporting limit, as this criterion would otherwise overestimate the significance of minor variations in concentrations at or near the laboratory reporting limit. Large RPDs returned for low concentrations of analytes near the reporting limit is not as indicative of a significant difference in the results as a small RPD is for larger concentrations.

This approach is employed by NATA accredited laboratories when assessing internal duplicate sample RPDs. This approach acknowledges that concentrations at or around the reporting limit are too low for an accurate evaluation of the significance of the RPD.

This approach has been adopted when assessing the relevance (compliance) of RPDs during this investigation. RPDs will be calculated for sample sets where one or both concentrations are less than 10 times the reporting limit for discussion purposes, but will not be assessed as a pass or fail in relation to the criterion.

A list of primary samples for the duplicate and triplicate soil and groundwater samples is provided in **Table G-3** with a summary of the RPD results is presented in **Appendix D**.

Table G-3 Primary, duplicate and triplicate sample summary

Parent Sample	Matrix	Duplicate ID	Triplicate ID
TP12_0.2	Soil	QA100	QA200
TP16_0.1	Soil	QA300	QA400
MW02	Water	QA100	QA200

Laboratory QC and QCI Report Summary

The laboratory selected for undertaking the analysis (Eurofins mgt) is NATA accredited for the analysis required, and undertook certain QA/QC requirements to demonstrate the suitability of the data that is obtained. The laboratory is required to undertake and report internal laboratory Quality Control (QC) procedures for all chemical analysis undertaken. The QC testing is required to include:

- Laboratory duplicate sample analysis at the rate of one duplicate analysis per ten samples;
- Method blank at the rate of one method blank analysis per 20 samples;
- Laboratory control sample at the rate of one laboratory control sample analysis per 20 samples; and
- Spike recovery analysis at the rate of one spike recovery analysis per 20 samples.

Compliance with the laboratory QA/QC requirements and non-conformance details are discussed in the internal Laboratory QA/QC reports included with the certificates of analysis in **Appendix F.**

The QA/QC Reports received from Eurofins mgt and ALS Laboratory (in **Appendix F**) highlights outliers flagged in the Quality Control Report and Holding Time breaches and breaches in the Frequency of Quality Control Samples. Review of the QA/QC documentation provided by Eurofins mgt and ALS indicates outliers existed which are summarised in **Table G-4** and **G-5.**

Table G-4 Laboratory QA/QC outlier summary – Eurofins mgt Laboratory

	QC Sample ID	Analyte	Description
Outliers: Quality Control Samples			
Method Blanks	-	-	-
Duplicates	M18-No15527	TRH C_{15}-C_{28}, TRH C_{29}-C_{36}, TRH C_{16}-C_{34}	RPD >30%, within Eurofins acceptance criteria
Laboratory Control Samples	-	-	-
Matrix Spikes	-	-	-
Regular Sample Surrogates	-	-	-
Outliers: Analysis Holding Time Compliance			
None			
Outliers: Frequency of Quality Control Samples			
None			

Table G-5 Laboratory QA/QC outlier summary – ALS Laboratory

	QC Sample ID	Analyte	Description
Outliers: Quality Control Samples			
Method Blanks	-	-	-
Duplicates	-	-	-
Laboratory Control Samples	-	-	-
Matrix Spikes	-	-	-

QC Sample ID		Analyte	Description
Regular Sample Surrogates	-	-	-
Outliers: Analysis Holding Time Compliance			
N/A			
Frequency of Quality Control Samples			
N/A			

Cardno concludes that the data reported by the NATA accredited Eurofins mgt and ALS Laboratory as presented in this ESA is suitable for interpretative purposes and to make conclusions/recommendations regarding Site contamination.

Air-Met Scientific P/L
7-11 Ceylon Street
Nunawading
Victoria 3131, Australia

Calibration Certificate

This document hereby certifies that this instrument detailed has been calibrated to the parameters listed below.

Certificate Print Date: 4 July, 2018
Calibration Date: 4 July, 2018
Next Calibration Due: 4 January, 2019

Call ID: 00220083

Job / SO Number: 231229

Customer: Cardno
Type: Port Gas Det
Model: PID
Serial No: 595-001369
Description: PID

Sensor	Date Code	Gas Bottle No.	Calibration Gas and Concentration	C.F	C.V	Certified	Instrument Readings	
							Before / Span Res.	After
PID	//	SY123	ISOBUTYLENE 100PPM, BAL			NIST	94.9PPM	100.5PPM
	//							
	//							
	//							
	//							
	//							

Completed by: *Jason Cheng*
Signed:

Australian Standard Alarm Levels ☑

CF - Conversion Factor, CV Compensated Value
CV = CF * Span Gas

APPENDIX 14: FLOOD EMERGENCY RESPONSE SUB-PLAN

FLOOD EMERGENCY RESPONSE PLAN
OUR REF:7863-FERP

KYEEMAGH PUBLIC SCHOOL
JACOBSON AVENUE,
KYEEMAGH NSW 2261

PREPARED BY: CAMERON AMRI
DATE: 17/07/2020
REVISION: **D**

DOCUMENT VERIFICATION

Project Title	Kyeemagh Public School
Document Title	Flood Emergency Response Plan
Project No.	7863
Description	Flood Emergency Response Plan
Client Contact	Taylor Constructions

	Name	Signature
Prepared by	Cameron Amri	Cameron Amri
Checked by	Michael Grogan	
Issued by	Michael Grogan	

REPORT DELIVERABLES

This report is to meet condition B18 of the SSD Conditions.

Condition	Condition requirements	Document reference
B18	The Flood Emergency Response Sub-Plan (FERSP) must address, but not be limited to, the following: (a) be prepared by a suitably qualified and experienced person(s);	CV Attached Appendix D
	(b) address the provisions of the Floodplain Risk Management Guidelines (EESG);	Section 3.2
	(c) include details of:	
	(i) the flood emergency response for construction phase of the development;	Section 5.2
	(ii) predicted flood levels;	3.5 Flood Documentation
	(iii) flood warning time and flood notification;	Section 4.2 & 4.3
	(iv) assembly points and evacuation routes;	Section 5.1 & Appendix B
	(v) evacuation and refuge protocols; and	Section 5.2
	(vi) awareness training for employees and contractors, and students.	Section 7

DOCUMENT HISTORY

Date	Revision	Issued to	Description
17/07/20	-A	DWP Suters	For CC1
30/07/20	-B	DWP Suters	For CC1
11/09/20	-C	Taylors	Amendment
18/09/20	-D	Taylors	Amendment

Table of Contents

1 EXECUTIVE SUMMARY

Birzulis Associates have been commissioned by Taylor Constructions to prepare a Flood Emergency Response Plan (FERP) on behalf of SINSW for the proposed stage 1 and stage 2 construction at Kyeemagh Public School. This report addresses the condition B18 in the SSD CoC, relevant Council DCP requirements and that of SES.

The aim of this FERP is for planning an evacuation (if required) due to flooding, promote situational awareness of expected flood behaviour and risks, identify measures to become flood prepared, recommend suitable coarse of action during and after flood events and any training required and by who.

This report will contain methodology used to support its conclusions and recommendations, a summary of the likely flood behaviours and safe exit routes from the site if required.

Stage 1 of the proposed works involves the demolition of the existing buildings to the North-East of the site and construction of the buildings on that half of the site.

Stage 2 of the proposed works will occur approximately after practical completion (PC) of the stage 1 works and the demolition of the existing buildings to the South-West half of the site.

The primary objective of this report is to define flood behaviours to Jacobson Avenue and Beehag Street. And any elements of these that contribute to the site itself.

2 INTRODUCTION

2.1 LOCATION

The site is located at 30A Jacobson Avenue, Kyeemagh NSW 2216 is broken up into two lots D.Ps (D.P.120095 & D.P. 335734). The current site is the operating site of Kyeemagh Public School. The site is generally sparsely planted and with minimal hard pavements.

To the North-West the site abuts a previous townhouse villa style development. To the South-East the site abuts Beehag Street. To the South-East the site abuts Jacobson Avenue. To the North-East the site abuts the school childcare centre which operates on the site and is not proposed to be altered. The site falls from the West to the South East at approximately 4%.

The total site area is 10 329m².

The site is shown below represented as Figure 2.1

Figure 2.1.1 – Total D.P. Envelope

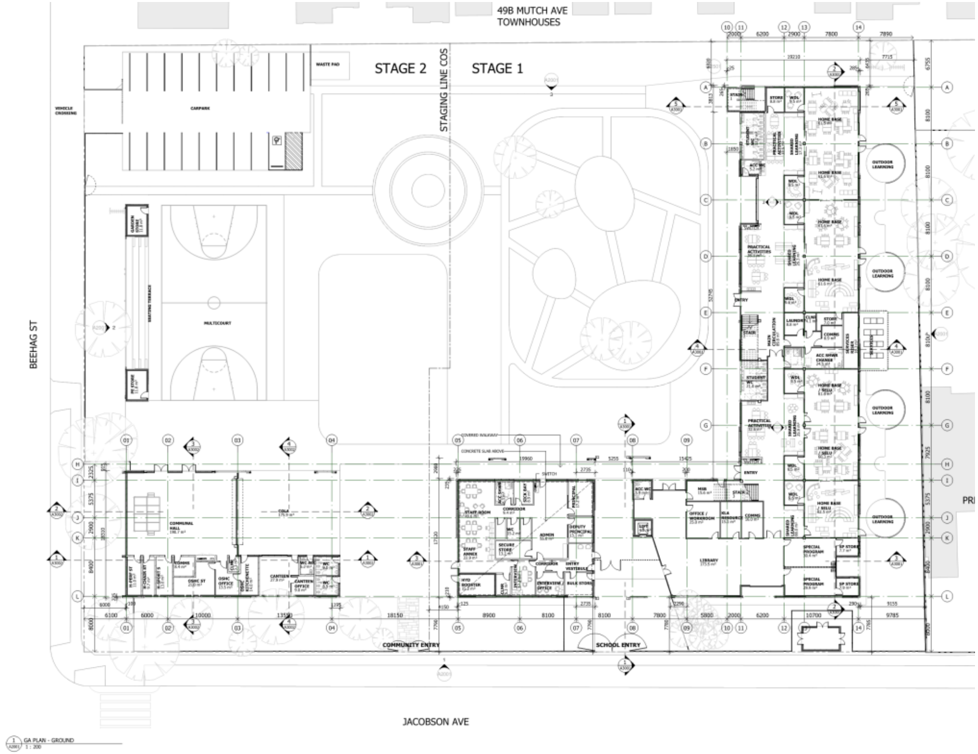


Figure 2.1.2 - Overall Site Plan Showing Staging of Works

Figure 2.1.3 - Aerial View of Kyeemagh Public School (Source: Google Map 2020)

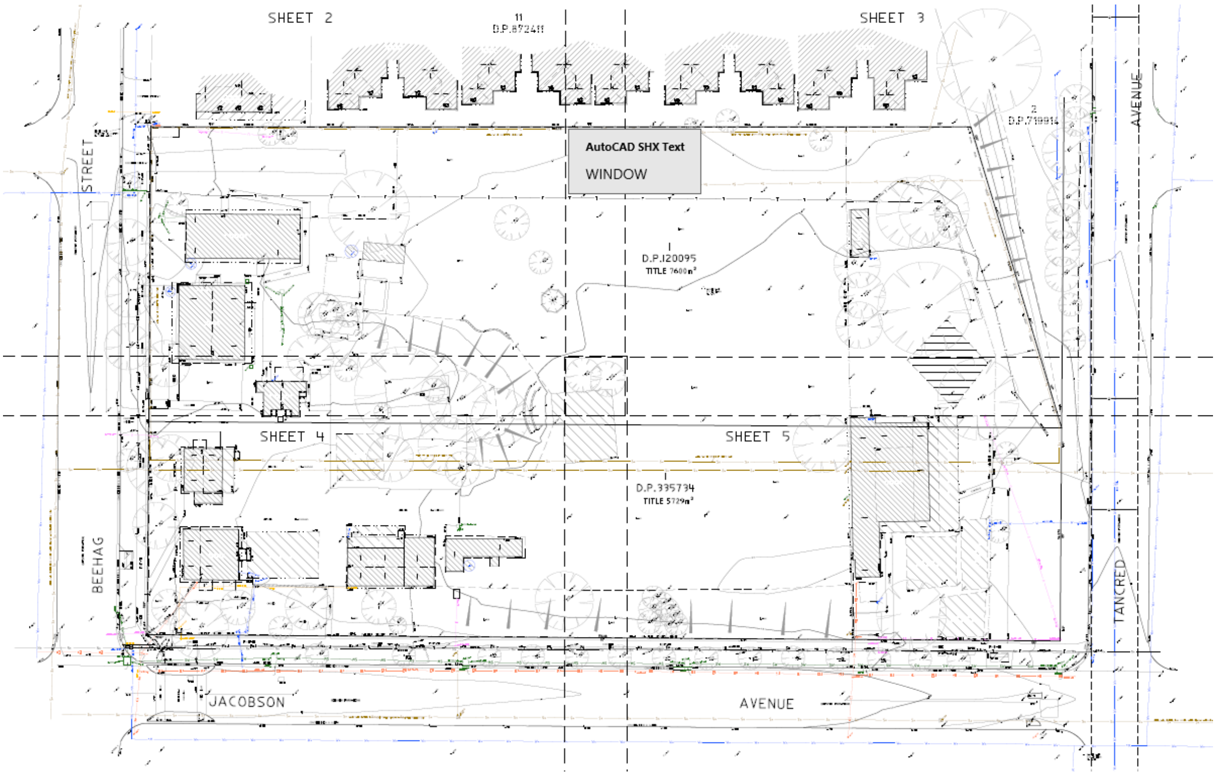


Figure 2.1.4 – Existing Survey (prepared by C.M.S Surveyors Pty Ltd 09/02/18)

2.2 GOVERNING AUTHORITIES FOR THIS SITE

Bayside Council

Department of Education

Emergency Services – SES – Police – Fire – Ambulance

Department of Environment Climate Change and Water

2.3 GLOSSARY OF TERMINOLOGY

Annual Exceedance Probability (AEP):

The chance of a flood of a given size (or larger) occurring in any one year, usually expressed as a percentage. For example, if a peak flood discharge of 500 m3/s has an AEP of 5%, it means that there is a 5% chance (i.e. a 1 in 20 chance) of a peak discharge of 500 m3/s (or larger) occurring in any one year. (see also average recurrence interval)

Australian Height Datum (AHD):

National survey datum corresponding approximately to mean sea level.

Astronomical Tide:

Astronomical Tide is the cyclic rising and falling of the Earth's oceans water levels resulting from gravitational forces of the Moon and the Sun acting on the Earth.

Attenuation

Weakening in force or intensity.

Average recurrence interval (ARI):

The long-term average number of years between the occurrence of a flood as big as (or larger than) the selected event. For example, floods with a discharge as great as (or greater than) the 20-year ARI design flood will occur on average once every 20 years. ARI is another way of expressing the likelihood of occurrence of a flood event. (see also annual exceedance probability)

Calibration:

The adjustment of model configuration and key parameters to best fit an observed data set.

Catchment:

The catchment at a particular point is the area of land that drains to that point.

Design flood event:

A hypothetical flood representing a specific likelihood of occurrence (for example the 100-year ARI or 1% AEP floods).

Development:

Existing or proposed works that may or may not impact upon flooding. Typical works are filling of land, and the construction of roads, floodway's and buildings.

Discharge:

The rate of flow of water measured in terms of volume per unit time, for example, cubic meters per second (m3/s). Discharge is different from the speed or velocity of flow, which is a measure of how fast the water is moving for example, meters per second (m/s).

Flood:

Relatively high river or creek flows, which overtop the natural or artificial banks, and inundate floodplains and/or coastal inundation resulting from super elevated sea levels and/or waves overtopping coastline defences.

Flood behaviour:

The pattern / characteristics / nature of a flood.

Flood fringe:

Land that may be affected by flooding but is not designated as floodway or flood storage

Flood hazard:

The potential risk to life and limb and potential damage to property resulting from flooding. The degree of flood hazard varies with circumstances across the full range of floods.

Flood level:

The height or elevation of floodwaters relative to a datum (typically the Australian Height Datum). Also referred to as “stage”.

Flood liable land:

See flood prone land

Floodplain:

Land adjacent to a river or creek that is periodically inundated due to floods. The floodplain includes all land that is susceptible to inundation by the probable maximum flood (PMF) event.

Floodplain management:

The co-ordinated management of activities that occur on the floodplain.

Floodplain risk management plan

A document outlining a range of actions aimed at improving floodplain management. The plan is the principal means of managing the risks associated with the use of the floodplain. A floodplain risk management plan needs to be developed in accordance with the principles and guidelines contained in the NSW Floodplain Management Manual. The plan usually contains both written and diagrammatic information describing how particular areas of the floodplain are to be used and managed to achieve defined objectives.

Flood planning levels (FPL):

Flood planning levels selected for planning purposes are derived from a combination of the adopted flood level plus freeboard, as determined in floodplain management studies and incorporated in floodplain risk management plans. Selection should be based on an understanding of the full range of flood behaviour and the associated flood risk. It should also consider the social, economic and ecological consequences associated with floods of different severities. Different FPLs may be appropriate for different categories of land use and for different flood plans. The concept of FPLs supersedes the "standard flood event". As FPLs do not necessarily extend to the limits of flood prone land, floodplain risk management plans may apply to flood prone land beyond that defined by the FPLs.

Flood prone land:

Land susceptible to inundation by the probable maximum flood (PMF) event. Under the merit policy, the flood prone definition should not be seen as necessarily precluding development. Floodplain Risk Management Plans should encompass all flood prone land (i.e. the entire floodplain).

Flood source:

The source of the floodwaters.

Flood storage:

Floodplain area that is important for the temporary storage of floodwaters during a flood.

Floodway:

A flow path (sometimes artificial) that carries significant volumes of floodwaters during a flood.

Freeboard:

Factors of safety usually expressed as a height above the adopted flood level thus determine the flood planning level. Freeboard tends to compensate for factors such as wave action, localised hydraulic effects and uncertainties in the design flood levels.

Geomorphology:

The study of the origin, characteristics and development of landforms.

Gauging (tidal and flood)

Measurement of flows and water levels during tides or flood events.

Historical flood:

A flood that has actually occurred.

Hydraulic:

Relating to water flow in rivers, estuaries and coastal systems; in particular, the evaluation of flow parameters such as water level and velocity.

Hydrodynamic:
Pertaining to the movement of water.

Hydrograph:
A graph showing how a river or creek's discharge changes with time.

Hydrographic survey:
Survey of the bed levels of a waterway

Hydrologic:
Pertaining to rainfall-runoff processes in catchments

Hydrology:
The term given to the study of the rainfall-runoff process in catchments

Hyetograph:
A graph showing the distribution of rainfall over time.

Intensity Frequency Duration (IFD) Curve:
A statistical representation of rainfall showing the relationship between rainfall intensity, storm duration and frequency (probability) of occurrence.

Isohyets:
Equal rainfall contour.

Morphological:
Pertaining to geomorphology

Peak flood level, flow or velocity:
The maximum flood level, flow or velocity that occurs during a flood event.

Pluviometer:
A rainfall gauge capable of continuously measuring rainfall intensity

Probable maximum flood (PMF):
PMF is an extreme flood event or the largest flood that could conceivably occur at a particular location, usually estimated from probable maximum precipitation, and where applicable, (such as snow / hail melt, blockages), coupled with the maximum flood that is likely to occur. Producing the worst flood for that catchment.

Probability:
A statistical measure of the likely frequency or occurrence of flooding.

Riparian:

The interface between land and waterway. Literally means “along the river margins”

Runoff:

The amount of rainfall from a catchment that ends up as flowing water in the river or creek

Stage:

See flood level.

Stage hydrograph:

A graph of water level over time.

Sub-critical:

Refers to flow in a channel that is relatively slow and deep.

Topography:

The shape of the surface features of land

Velocity:

The speed at which the floodwaters are moving. A flood velocity predicted by a computer flood model is quoted as the depth averaged velocity, i.e. the average velocity throughout the depth of the water column or velocity across the whole river or creek section, or roadway.

Validation:

A test of the appropriateness of the adopted model configuration and parameters (through the calibration process) for other observed events.

Water level:

The level of the top of the water being described.

2.4 SCOPE OF METHODOLOGY

This report was based on flood information provided by Bayside Council and from Flooding Advice completed by Cardno 31 October 2018

In addition to this, a DRAINS model with overland flow capabilities was prepared to determine the capacity of the Council trunk drainage system to cope with upstream flows for any serious incident of pit surcharging in vicinity of the school.

3 FLOOD BEHAIVIOUR

3.1 POSSIBLE FLOOD SOURCE/S AND MECHANISMS

The site may be impacted by two flood mechanisms/types of flooding:

1. Fluvial flooding – flooding from Cooks River (rising river waters); and

2. Pluvial flooding (overland flow) – flooding from rainfall within the local catchment. It is important to understand both types of flooding as they pose different risks, have different consequences and evacuation & refuge response.

There is not a significant upstream catchment for this site given the site is located somewhat on a peninsula where the lands falls towards the water on all sides.

Also, the site is not significantly far from the mouth of the Cooks River and Botany Bay.

The main source is the stormwater and runoff running down Jacobson Avenue and towards Jacobson avenue from the upstream blocks.

It is important to note that the area is a marine sand area with moderate infiltration capacity and as such runoff generated will mainly be from imperious areas and are not significantly contributed to by the pervious areas.

3.2 NSW OEH FLOODPLAIN RISK MANAGEMENT GUIDELINES

The NSW Office of Environment and Heritage (OEH) has released a range of standard documents to support the implementation of the NSW Government's Flood Prone Land Policy through the development and implementation of FRM plans by local government through the FRM process as outlined in the Floodplain Development Manual (2005).

3.2.1 Flood Emergency Response Planning (ERP) – Classification of Communities

Of relevance to the CRC FRP is the guideline Flood Emergency Response Planning (ERP) – Classification of Communities. The guideline recommends that the ERP classification of the floodplain be undertaken for the probable maximum flood (PMF) and 20 and 100 year average recurrence interval (ARI) events. Classifications are to be provided for each event with reference back to the event.

The Site is classified according to NSW OEH definitions as shown in Table 3.2.1 below.

ARI	NSW OEH classification	NSW OEH definition
20 year ARI – River Flood	Area with rising road accessible (RRA)	Areas with Rising Road Access (RRA) are those areas where access roads rising steadily uphill and away from the rising floodwaters. The community cannot be completely isolated before inundation reaches its maximum extent, even in the PMF. Evacuation can take place by vehicle or on foot along the road as floodwater advances. People should not be trapped unless they delay their evacuation from their homes. For example people living in two storey homes may initially decide to stay but reconsider after water surrounds them.
20 year ARI – Pluvial flood (overland flow)	High Flood Island (HFI)	High Flood Island (HFI). The flood island includes enough land higher than the limit of flooding (i.e. above the PMF) to cope with the number of people in the area. During a flood event the area is surrounded by floodwater and property may be inundated. However, there is an opportunity for people to retreat to higher ground above the PMF within the island and therefore the direct risk to life is limited. The area will require resupply by boat or air if not evacuated before the road is cut. If it will not be possible to provide adequate support during the period of isolation, evacuation will have to take place before isolation occurs.
100 year ARI		
PMF		

Table 3.2.1

3.2.2 State Emergency Services Requirements from the Floodplain Risk Management Process

Also of relevance to the site's FERP is the State Emergency Services Requirements from the Floodplain Risk Management Process which describes how the FRM process assists State Emergency Service (SES) in effective emergency response planning (ERP).

For HFI's, the key considerations are:

- External access cut, area becomes isolated;
- Transport infrastructure shutdown (railways/airports);
- Risk Of Flooding Of Key Public Utilities (Water/Sewage/Gas/Power) Starts; and
- Whole area flooded or max flood extents occur.

3.3 EXISTING STORMWATER DRAINAGE

The property is currently developed as a public school with an existing pit and pipe drainage system located on site. All current overland flows travel towards the east eventually discharges onto Tancred avenue and then to the crook s river located approximately 200m to the North. The indicative external stormwater network is shown in Figure 2.3.1 and is the Council trunk drainage system and is believed to be in a satisfactory condition.

Figure 2.3.1 – Indicative External Stormwater system (Source: Bayside Council)

3.4 PROPOSED SITE DRAINAGE SYSTEMS

The proposed site drainage system is to install infiltration systems to capture and infiltrate the site runoff onsite with only minimal discharge offsite. This will significantly reduce any flooding impact of hydraulic stress on the existing stormwater drainage system in Jacobson Avenue. The table below shows the post construction site runoff to be significantly less than the pre-development condition reducing peak discharge in the 100 year event from 225 litres per second to 81 litres per second.

ARI	Design Storm Duration	Peak Flow (m3/s)		
		Pre-developed	**Post-developed**	
		Site	Site (no atten.)	Site (+ atten.)
5	5	0.112	0.143	0.009
20	5	0.191	0.221	0.063
100	5	0.225	0.257	0.081

Table 3.2.2 - Site and Detention Hydrology

3.5 FLOOD DOCUMENTATION

Flood design guidance has been provided by Bayside Council and Cardno using a review of relevant flood studies. The following is relevant:

- The design flood level for the site is RL 2.65m AHD provided by Bayside Council
- The Probable Maximum flood (PMF) level is RL 2.98m AHD provided by Bayside Council.
- Flood planning level is RL 3.15m AHD provided by Bayside Council.
- The site has been assessed as Low Hazard by Bayside Council.
- The water table is probable at RL 1.5m – 2m AHD.
  - The proposed building floor level of RL4.65m AHD is sufficiently located above the design flood level.

A small floor storage area presents in the 1:100 year ARI event with a depth approximately 0.1m to 0.3m located in vicinity of RL 3.5m on the site.

Cardno’s Flooding Advice letter dated 20 May 2020 for the site states

> “Further to our letter dated 31 October 2018 in regard to Kyeemagh Public School and the effect on flooding on the proposed development we confirm that we have reviewed the report prepared by BMT WBM dated February 2017- Spring Street Drain, Muddy Creek and Scarborough Ponds Catchments Flood Study Review.
>
> Kyeemagh Public School is located at the corner of Jacobson Avenue and Beehag Street, Kyeemagh and a CORE 14 school development is proposed. The proposed development is a combination of single and double storey buildings with a constant proposed ground floor level of RL4.65m AHD.
>
> Cardno have reviewed available flood mapping of the area surrounding the school as documented in the above report.
>
> Flood extent mapping was reviewed for both the 1% AEP and PMF storm events. The Kyeemagh Public School site is shown to be affected by both the 1% AEP and PMF flood extents. A copy of relevant flood mapping is attached. The Kyeemagh Public School proposed floor level of RL4.65m is in our opinion, well above the expected 1% AEP and PMF flood levels based on the existing ground levels as documented in the attached part survey plan.
>
> We have also received the attached Flood Advice letter from Bayside Council dated 18 May 2020 that confirms that the property is affected by the 1% Annual Exceedance Probability (AEP) flood. The provided 1% AEP Flood level is RL 2.65m AHD and the Probable Maximum flood (PMF) level is RL 2.98m AHD. The letter also provides a Flood Planning level (FPL) RL 3.15m AHD which is a minimum height to be used for the setting of habitable floor levels. All of the provided flood levels in the Flood Advice letter are below the proposed building floor level of RL 4.65m AHD.
>
> Further inspection shows that main roads near the site, such as General Holmes Drive, are not flood affected during the 1% AEP and PMP storm events. These roads are therefore expected to be available for use as an evacuation route if required.”

Figure 2 – Kyeemagh Public School -1:100 year (approximately 0.1 to 0.3m depth)

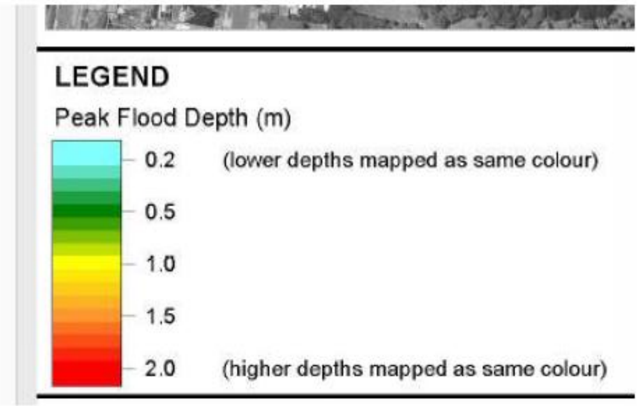


Figure 3.4.1 – Shows the 100 year flooding for this immediate area and the site (Source: Cardno)

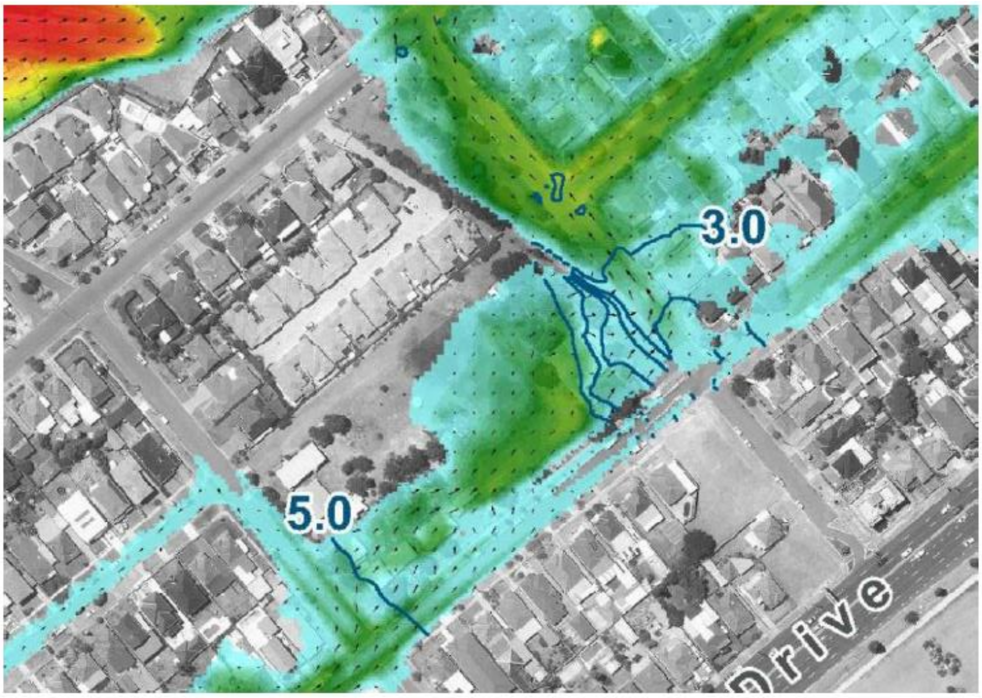


Figure 1 – Kyeemagh Public School – PMF (approximately 0.3-1.0m depth)

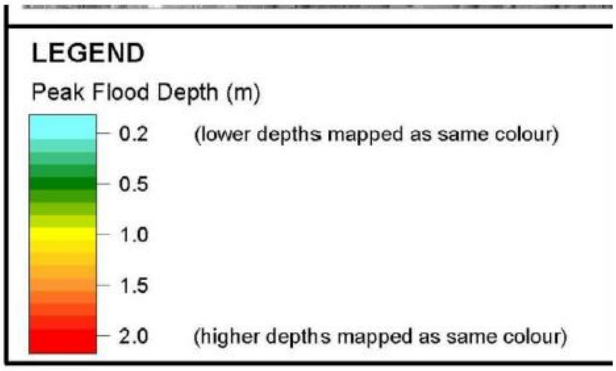


Figure 3.4.2 – Shows the PMF flooding for this immediate area and the site (Source: Cardno)

3.6 FLOOD SOURCE ELIMINATION

The mapping below shown the surge water level as a result of the flood source from the Cooks River does not affect the site in the 100 year rain event or the PMF event. This can be ruled out as a flood source for the site and it can be concluded the only flood source is local stormwater runoff.

Figure 3.5.1 – Shows the 100 year flooding for Botany Bay & Cooks River (Source: Cardno)

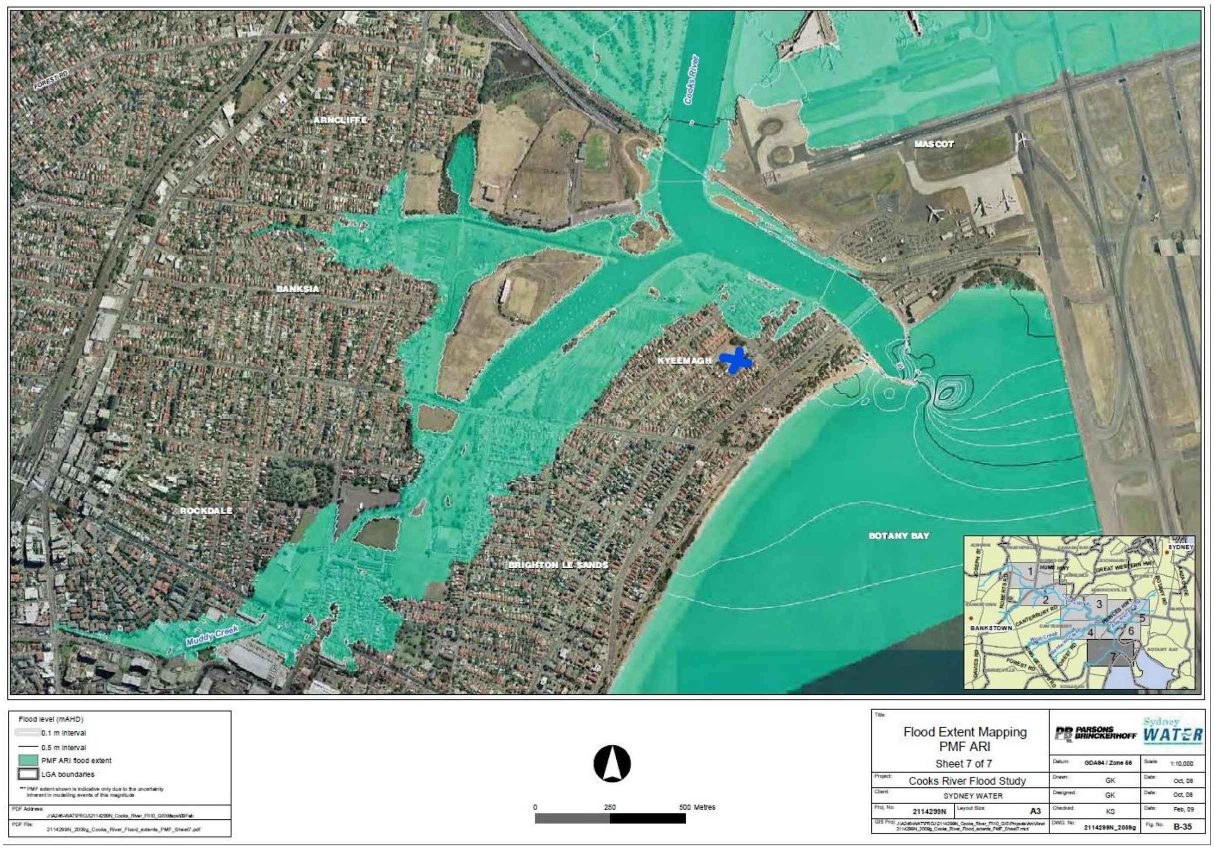


Figure 3.5.2 – Shows the PMF flooding for Botany Bay & Cooks River (Source: Cardno)

3.7 FLOOD BEHAVIOUR & FLOOD HAZARD CATEGORYS

Given the elimination of the Cooks River flood source the site should have a relatively short response time less than 1 hour. Basically this site will be performing more of a flash flooding style performance in lieu of a long response time where flood waters need time to drain from significant upstream catchments. Hence, it is imperative that prompt action is taken to avoid adverse impacts to exposure to flood hazards.

Flood modelling and VxD governs the ability of evacuation. As can be seen above, even in the MPF flood the carpark exit will not be flood affected. Also it has been previously noted that General Holmes Drive is not flood affected. Evacuation and response to the site is possible through that exit and main road.

Modelling along Jacobson Avenue suggest the maximum water flow above ground (assuming 80% pit blockages) could be up to 0.620m^3 per second. This equates to a flow depth of 0.168mm, a velocity of 1.3 meters per second and a VD relationship of 0.21 which is less than the 0.4 safe maximum.

It can thus be concluded that exiting and entry to the site from Jacobson Avenue is possible up to the 100 year event.

It should be noted that driving through flood waters is extremely hazardous and risk of vehicles being swept away downstream is shown below in the following figures.

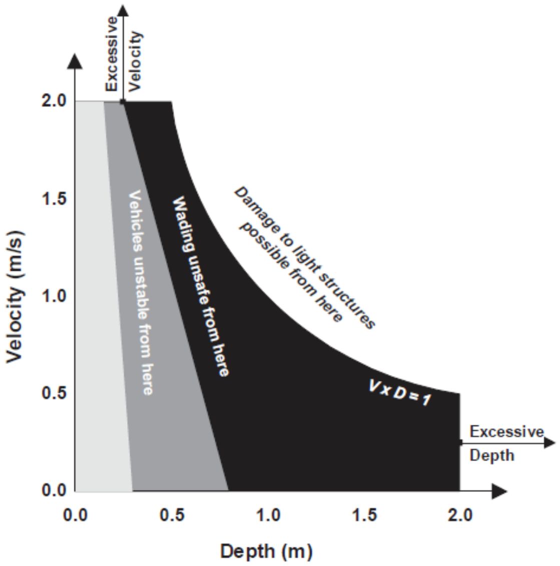


Figure 3.6.1 – Velocity & Depth relationships

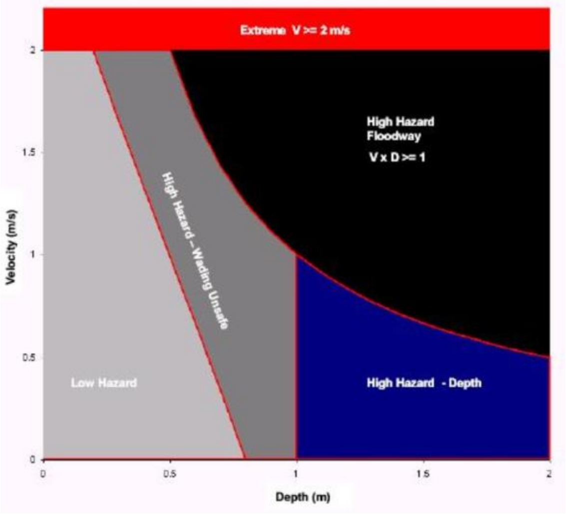


Figure 3.6.2 – Hazard Categories

4 FLOOD EVEACUATION WARNINGS

4.1 FLOOD INTELIGENCE

Rainfall gauge stations are maintained by the Bureau of Meteorology (BOM) throughout Sydney. These provide information to the BOM including other information sources to assist in the flood warning systems. The BOM issues five times of warnings through the following methods:

- Radio
- Television
- Websites
    - http://www.bom.gov.au/
    - http://www.bom.gov.au/nsw/warnings/

In addition to this the SES may issue warnings in the form of:

- Bulletins
- Evacuation Warnings or Evacuation Order

The critical 100-year storm event duration has been identified as approximately the 2-hour event. This does not mean that the peak flood level will occur exactly 2 hours after a heavy rainfall event commences but does provide an indication on how rapidly the water levels will rise within Jacobson Avenue.

It is recommended that a temporary flood gauge be installed in a visible location at the low point on the site corner (north eastern corner) at approximately RL 4.0 to provide indication of the rate of rise in flood levels within Jacobson Avenue for the duration of the construction works.

15 minutes after heavy rainfall commences all plant should be relocated to an area above the 100-year flood extent on the northern side of the site. All work shall cease within the flood prone area and employees and contractors shall take shelter within the site amenities as located on the site establishment plan appended to this report.
Works should not recommence within any flood prone area until 1 hour after the water level upstream of Jacobson Avenue has started to subside. At this time the site manager will issue the ‘All Clear’ and the exclusion zone removed.

4.2 FLOOD NOTIFICATION - TRIGGER/ACTION

Flood warning notifications are the first stage of the flood warning system implemented by the managing contractor. Flood warnings are triggered when flooding is likely to cut evacuation routes or inundate flood prone areas of the site. During any rain event the site manager and/or supervisor shall review the flood gauge at the commencement of the rainfall, 5 minutes and 10 minutes after the rainfall event starts. If a significant rate of rise is observed (greater than 0.6m/hr) then the site manger or supervisor shall notify any workers within the flood extent to cease work immediately and relocate themselves, plant and any other loose items clear of the flood prone area.

A call shall be put over the site radio that a flood notification has been issued and the areas of the site within the 100 year flood extent shall be classified as an exclusion zone during the rainfall event. Given the location of the temporary site access road (off Jacobson Avenue) this includes the main Stage 1 entry/exit to the site.

4.3 WARNING TYPES

4.3.1 Severe Weather Warning

Given by the BOM, are provided for potentially hazardous or dangerous weather that is not solely related to severe thunderstorms, tropical cyclones or bushfires. They are issued whenever severe weather is occurring in an area or is expected to develop or move into an area.

4.3.2 Severe Thunderstorm Warning

Given by the BOM, are provided to warn communities of the threat of dangerous thunderstorms. They are issued when a severe thunderstorm is occurring or likely to occur.

4.3.3 Flood Alert/Watch/Advice

A flood alert/watch/advice will be issued if flood producing rain is expected. This provides an early warning that flooding may occur

4.3.4 Generalised Flood Warning

A generalised flood warning is to be issued when flooding is expected to occur in a given area. Three hours warning time is expected from issue of warning to peak flood level as per the "Service Level Specification for Flood Forecasting and Warning Services for New South Wales – Version 2.0" (Bureau of Meteorology, 2013).
This is the most likely warning type for the subject site should evacuation need to occur.

4.3.5 Minor/Moderate Flood Warning

A more detailed flood warning may be issued based on any additional information available. Three hours warning time is expected from issue of warning to peak flood level.
Real time river and harbour height data is available from the Bureau of Meteorology website. As at January 2017, this link was *http://www.bom.gov.au/nsw/flood/.*
All warnings will be issued through the website, radio and television. Radio frequencies include ABC Sydney (702AM, 92.9FM, 206.352MHz digital), Triple J (105.7FM), 2DayFM (104.1FM), Triple M (104.9FM), Nova (96.9FM), KIIS (106.5FM), 2GB (873AM), 2UE (954AM). All public and Commercial television stations should broadcast warnings.

4.3.6 SES Flood Bulletins

The SES may issue a flood bulletin providing information of the likely flood consequences and recommended actions.

4.3.7 Evacuation Warning

The SES/Police may issue an evacuation warning which allows time to prepare for evacuation.

4.3.8 Evacuation Order

The SES will issue an Evacuation Order if evacuation is required. If this occurs evacuation **must** be undertaken. Broadcast will be via radio/TV, door knock, automated telephone message or SMS.

4.3.9 Early Warning Network Automated Text and Email Service

The property can register for automatic alerts with the Early Warning Network (www.ewn.com.au) which will filter the above BoM warnings and send texts and emails to the Chief Flood Warden or property owners to notify them of the situation.

4.3.10 On-Site Emergency Tone

The PA system will have an uninterrupted power supply and be configured to sound an emergency tone meaning all visitors, staff and students shall assemble in the designated assembly point (the Auditorium) under the direct of staff and flood wardens.
This tone will be tested every drill, or once a term. Should it be inoperable in the event of an emergency, an air horn and handheld loudspeaker is located within the Flood Emergency Kit.

4.3.11 Dipstick Flood Alert System

The Dipstick Flood Alert System by Tuftec (http://tuftec.com.au) will provide a failsafe for notification on-site in the event that no warnings are issued by either the Bureau or the SES. This device senses when water reaches a pre-determined level and sends a text with an alert and rate of rise to nominated stakeholders including Council and all Flood Wardens.

4.3.12 Flood Depth Gauge

This is a manual system where the depth gauge shows the flood depth and markings can be made on the depth to determine the flood severity. For example, 100 year event or 50 year event.

5 ASSEMBLY POINT AND SAFE EVACUATION RESPONSE ROUTES

5.1 EMERGENCY ASSEMBLY POINT

The site manager or supervisor shall notify any workers to cease work and relocate themselves to:

- Stage 1: the lunch room shed which is 400mm above ground and above PMF water flows. All workers shall be accounted for.
- Stage 2: the upper carpark off Beehag Street

In the event any worker/contractor cannot be accounted for the following steps shall be undertaken:

1. A radio call be placed across emergency site channel or appropriate site channel to identify the unaccounted-for person. This shall be made a minimum of three times. Also, their mobile phone shall be rung from the site sign in sheet.
2. The site manager or delegated person shall inspect where safe to do so the flood affected area and the site to locate the unaccounted-for person. **It is important to note that at no time shall a person enter the flooded area whilst flood waters are rising**.
3. If this fails to locate the person all other reasonable means shall be used such as email, office phone calls text messages and so on.

Workers shall remain in the refuge of the site office/s until the “all clear” has been given by the site manager.

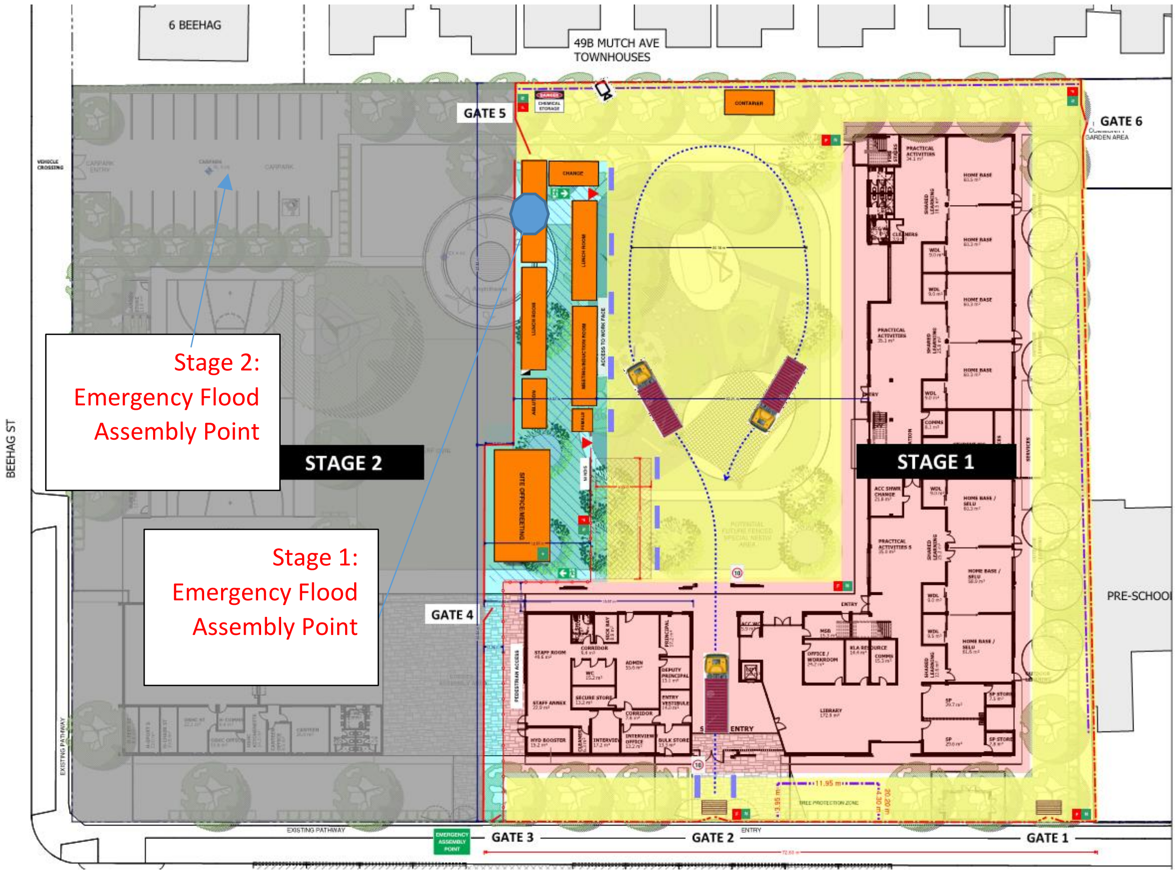


Figure 5.1.1 – Assembly Point and Refuges

5.2 EVACUATION RESPONSE & REFUGE

Since the site is only partially flood prone and site accommodations have been located outside of the 100-year flood extent there is no foreseeable reason why the site would have to be fully evacuated due to a flood. Should an evacuation be required for any other reason then the Emergency Management Plan prepared by the managing contractor shall be implemented.

Given the above, **the strategy of rest-in-place (onsite refuge) is recommended for this site during major flood events**. The site is not cut off by flood water and has access to main roads unaffected in a major flood event however where possible, evacuation during a significant flood event should be discouraged.

5.3 SITE ACCESS ROUTES DURING FLOODING

Stage 1: Given the main site access is from Jacobsons Avenue there are no employees or contractors will be able to leave the site in a south easterly direction during heavy rainfall.

Stage 2: Given the main site access is from Beehag Street there is no restrictions to employees or contractors leaving the site during a flood event through the upper carpark as long as they walk away from Jacobsons Avenue.

Should workers or contractor be required to leave site they shall notify the site manager and leave the site in a westerly direction.

Only once the flood risk has abated and the site manager issued the 'All Clear' shall the main site accesses be open and egress to all directions re-established.

6 EMERGENCY CONTACT

For State Emergency Services (SES) which offer emergency assistance during major natural events are available by phone on 132 500

For Police, Fire or Ambulance which offer specialist first responders call 000

Once the call has been made notify the key appointments noted in Table 5.2

7 FLOOD RESPONSE PREPARATION AND TRAINING

Flood Awareness training shall be provided as part of site inductions and "tool-box meetings" (not less than every 3 months) as an ongoing reminder.

The following floor awareness items shall be covered:

1. Location of assembly areas, and predicted flood levels based on flood mapping given in this report.
2. Details of the types of flood warnings and notifications
3. The refuge protocol "rest-in-place"
4. Changes to the site access during heavy rainfall

8 FLOOD EMERGENCY RESPONSE FOR BOTH CONSTRUCTION AND OPERATIONAL PHASE

During proposed construction works all site employees and contractors will be informed about the SINSW site wide flood evacuation/emergency management plan requirements and guidelines. Taylor Construction will work with the stakeholders prior to completion of works, to incorporate any changes required to this plan as a result of this development.

9 CONCLUSION

As the site is only partially affected by a PMF flood and unaffected by a 1:100 year flood the site is relatively low risk.

The following strategies have been documented and require implementation to ensure that the requirements of the SSD Condition of Consent is achieved:

- Predicated flood levels and extent of flooding on-site is as per Section 3 .
- Flood warning times and flood notification Monitoring, as per details in Section 4.
- Assembly points and refuge protocols as detailed in Section 5.
- Changes to site access as a result of flooding as detailed in Section 5.
- Ensuring employees and contractors are aware of the site-specific flood risk as outlined in Section 7.

We have examined the site, relevant documentation/reference material and the proposed development in accordance with acceptable engineering practice. We have undertaken overland flow checks to determine velocities in the road flows offsite. We declare that he proposed development will be safeguarded from flooding and flood damage associated with the design flood and will not adversely affect any other structure or property,. We area also satisfied the foreseeable flood related risks are adequately identified and managed by this report.

10 REFERENCES

Rockdale LEP 2011 – Flood maps

Rockdale DCP 2011

The Construction Soil and Water Management Plan for this site prepared by us.

NSW Government's 'Floodplain Development Manual 2005'.

Spring Street Drain, Muddy Creek and Scarborough Ponds Catchments 2D Flood Study Review, BMT WBM, 2017

SES Flood Safe Website

SES Emergency Business Continuity Plan

Bureau of Meteorology website

11 APPENDIX A – GROUND LEVEL FLOOR PLAN

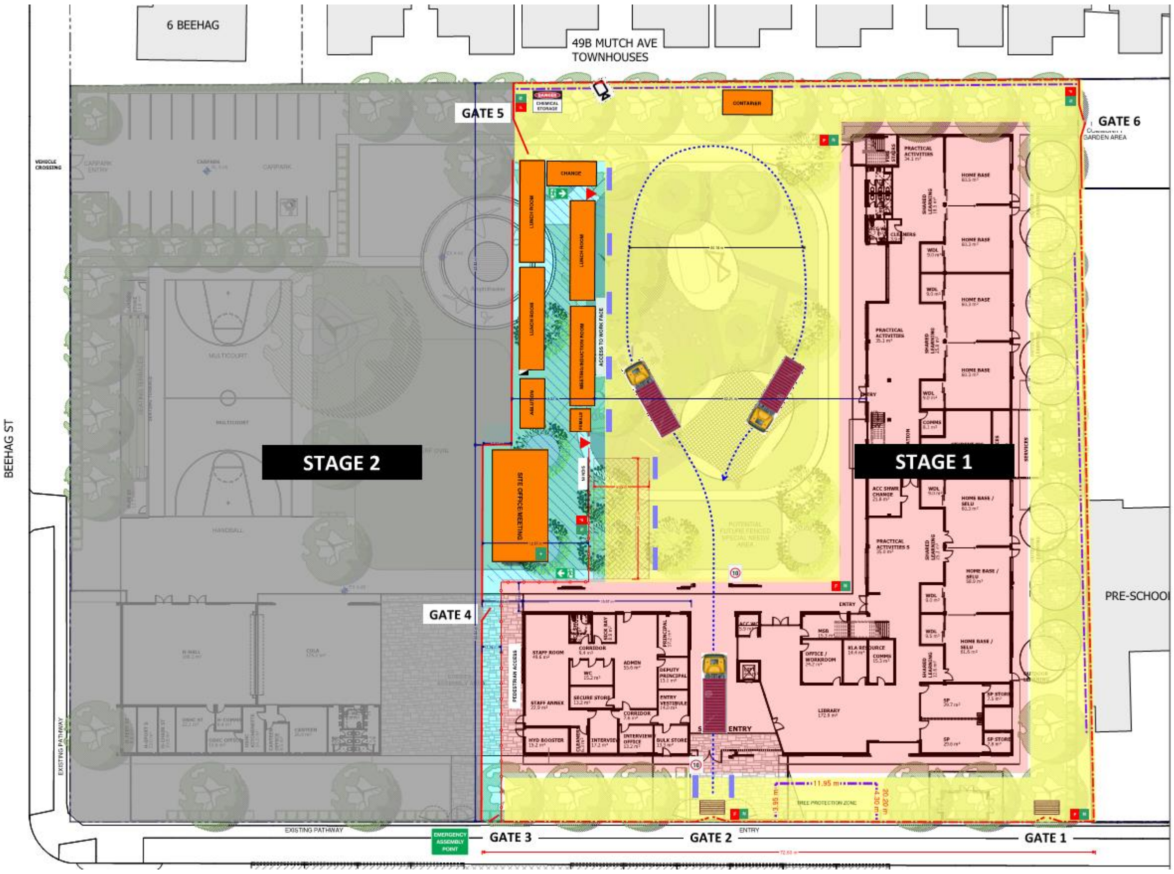


Figure A.1 – Ground Level Floor Plan

12 APPENDIX B – FLOOD EVACUATION ROUTE

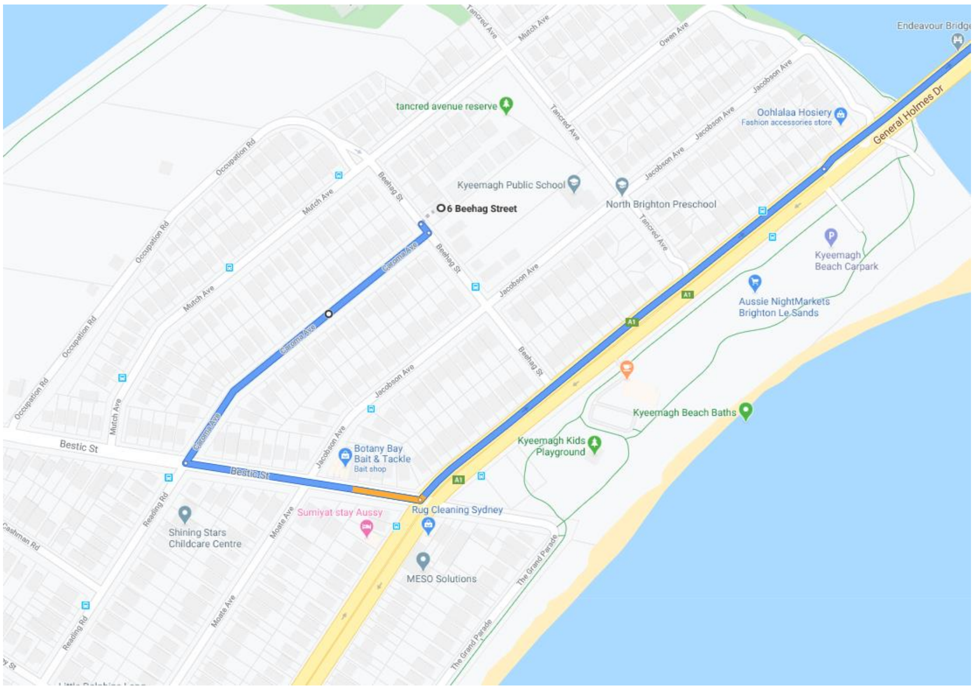


Figure B.1 – Flood Evacuation Route North (only for emergencies during a major flood event)

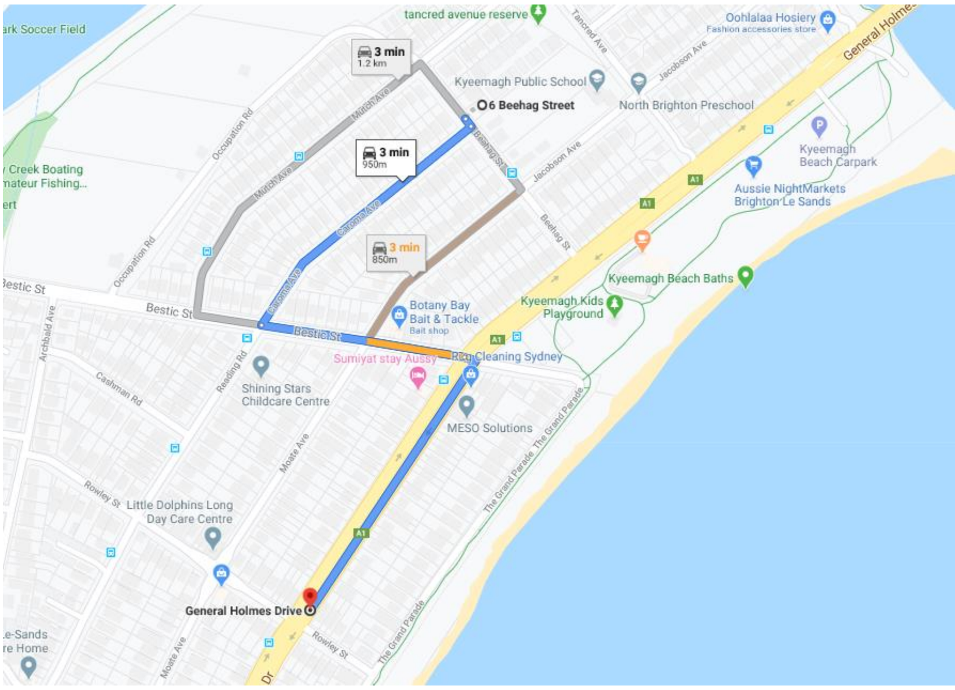
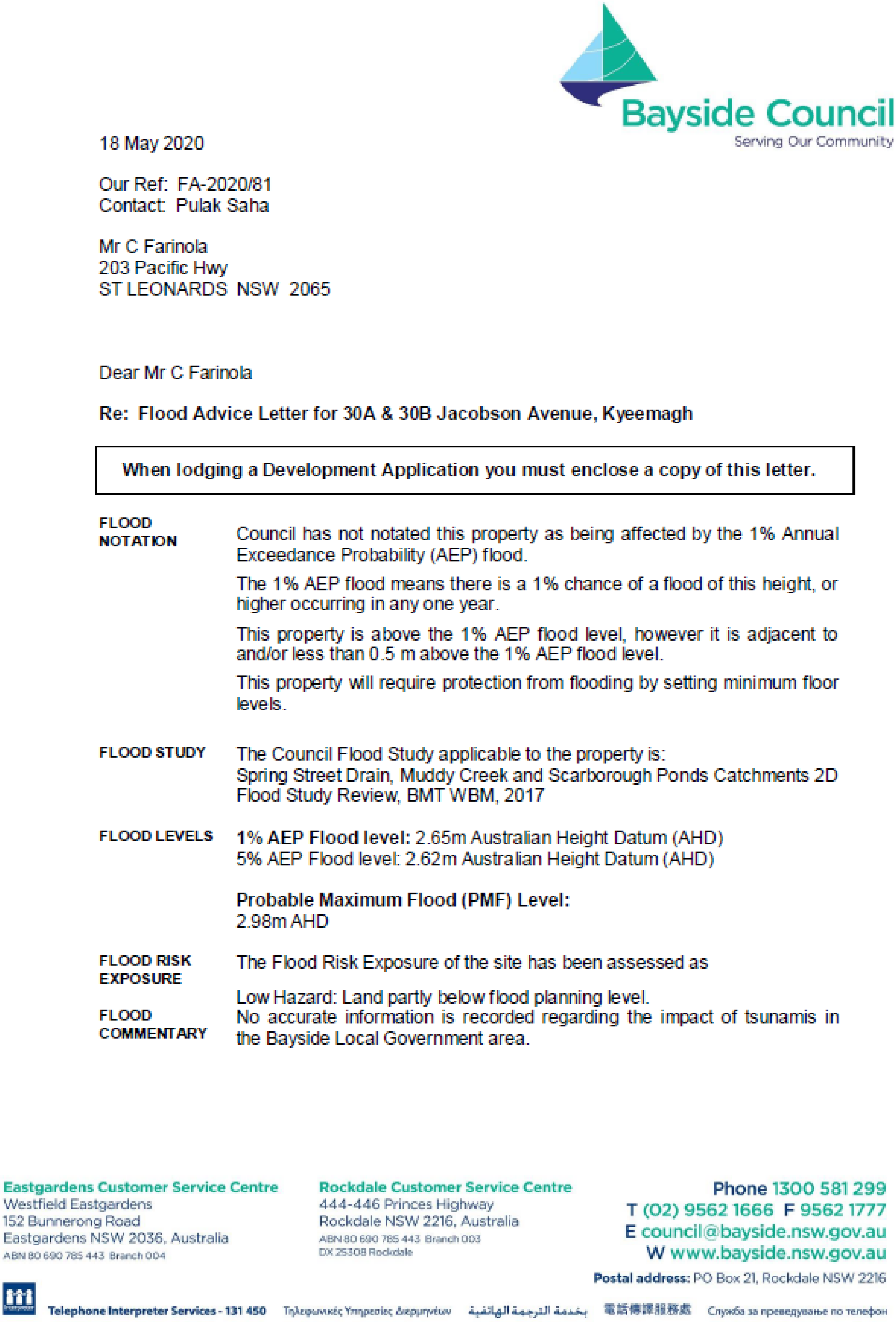


Figure B.2 – Flood Evacuation Route South (only for emergencies during a major flood event)

13 APPENDIX C – REFERENCED DOCUMENTATION



Bayside Council
Serving Our Community

18 May 2020

Our Ref: FA-2020/81
Contact: Pulak Saha

Mr C Farinola
203 Pacific Hwy
ST LEONARDS NSW 2065

Dear Mr C Farinola

Re: Flood Advice Letter for 30A & 30B Jacobson Avenue, Kyeemagh

When lodging a Development Application you must enclose a copy of this letter.

FLOOD NOTATION

Council has not notated this property as being affected by the 1% Annual Exceedance Probability (AEP) flood.

The 1% AEP flood means there is a 1% chance of a flood of this height, or higher occurring in any one year.

This property is above the 1% AEP flood level, however it is adjacent to and/or less than 0.5 m above the 1% AEP flood level.

This property will require protection from flooding by setting minimum floor levels.

FLOOD STUDY

The Council Flood Study applicable to the property is:
Spring Street Drain, Muddy Creek and Scarborough Ponds Catchments 2D Flood Study Review, BMT WBM, 2017

FLOOD LEVELS

1% AEP Flood level: 2.65m Australian Height Datum (AHD)
5% AEP Flood level: 2.62m Australian Height Datum (AHD)

Probable Maximum Flood (PMF) Level:
2.98m AHD

FLOOD RISK EXPOSURE

The Flood Risk Exposure of the site has been assessed as

Low Hazard: Land partly below flood planning level.

FLOOD COMMENTARY

No accurate information is recorded regarding the impact of tsunamis in the Bayside Local Government area.

Eastgardens Customer Service Centre
Westfield Eastgardens
152 Bunnerong Road
Eastgardens NSW 2036, Australia
ABN 80 690 785 443 Branch 004

Rockdale Customer Service Centre
444-446 Princes Highway
Rockdale NSW 2216, Australia
ABN 80 690 785 443 Branch 003
DX 25308 Rockdale

Phone 1300 581 299
T (02) 9562 1666 F 9562 1777
E council@bayside.nsw.gov.au
W www.bayside.nsw.gov.au
Postal address: PO Box 21, Rockdale NSW 2216

Telephone Interpreter Services - 131 450 Τηλεφωνικές Υπηρεσίες Διερμηνέων بخدمة الترجمة الهاتفية 電話傳譯服務處 Служба за преведување по телефон

Our Ref: 80818157LO:01 CF
Contact: Cosmo Farinola

Cardno (NSW/ACT) Pty Ltd
ABN 95 001 145 035

34/205-207 Albany Street North
Gosford NSW 2250
Australia

Phone +61 2 4323 2558
Fax +61 2 4324 3251

www.cardno.com

20 May 2020

DWP | Design Worldwide Partnership
Suite 2, 19 Harris Street
Pyrmont NSW 2009

Attention: Cameron Martin

Dear Cameron,

KYEEMAGH PUBLIC SCHOOL – FLOODING ADVICE

Further to our letter dated 31 October 2018 in regard to Kyeemagh Public School and the effect on flooding on the proposed development we confirm that we have reviewed the report prepared by BMT WBM dated February 2017- Spring Street Drain, Muddy Creek and Scarborough Ponds Catchments Flood Study Review.

Kyeemagh Public School is located at the corner of Jacobson Avenue and Beehag Street, Kyeemagh and a CORE 14 school development is proposed. The proposed development is a combination of single and double storey buildings with a constant proposed ground floor level of RL4.65m AHD.

Cardno have reviewed available flood mapping of the area surrounding the school as documented in the above report.

Flood extent mapping was reviewed for both the 1% AEP and PMF storm events. The Kyeemagh Public School site is shown to be affected by both the 1% AEP and PMF flood extents. A copy of relevant flood mapping is attached. The Kyeemagh Public School proposed floor level of RL4.65m is in our opinion, well above the expected 1% AEP and PMF flood levels based on the existing ground levels as documented in the attached part survey plan.

We have also received the attached Flood Advice letter from Bayside Council dated 18 May 2020 that confirms that the property is affected by the 1% Annual Exceedance Probability (AEP) flood. The provided 1% AEP Flood level is RL 2.65m AHD and the Probable Maximum flood (PMF) level is RL 2.98m AHD. The letter also provides a Flood Planning level (FPL) RL 3.15m AHD which is a minimum height to be used for the setting of habitable floor levels. All of the provided flood levels in the Flood Advice letter are below the proposed building floor level of RL 4.65m AHD.

Further inspection shows that main roads near the site, such as General Holmes Drive, are not flood affected during the 1% AEP and PMP storm events. These roads are therefore expected to be available for use as an evacuation route if required.

Should you require any additional information, please do not hesitate to contact the undersigned.

Yours sincerely,

Cosmo Farinola
Business Unit Manager - Buildings
for Cardno
Direct Line: +61 2 9496 7749
Email: cosmo.farinola@cardno.com.au

Attachments

1. Flood Extent Mapping PMF ARI – BMT WBM report dated February 2017
2. Flood Extent Mapping 100 year ARI – BMT WBM dated February 2017
3. Survey Report – CMS Surveyors dated 09/02/2018
4. Bayside Council Flood Advice letter dated 18 May 2020.

14 Appendix D – CV of Engineer

CAMERON AMRI
SENIOR CIVIL & STRUCTURAL ENGINEER

Bachelor of Engineering in Civil Engineering
University of Technology Sydney

Professional memberships

Member of the Institution of Engineers, Australia
Chartered Professional Engineer (CPEng)
Registered on the National Engineering Register (NER)
Registered Professional Engineer of Queensland

Experience
Since completing his degree in 2007, Cameron has worked as a civil structural engineer for MLH, Kneebone & Beretta, E2 Design and for Birzulis Associates Pty Ltd.

A selection of projects Cameron has been involved in:

Aged Care
- HammondGrove, Hammondville
- Scalabrini Village Bexley
- Scalabrini Village Drummoyne
- Scalabrini Village Austral
- Scalabrini Village Chipping Norton
- Scalabrini Village Griffith
- Scalabrini Village Yoogali

Religious
- Our Lady of Mount Carmel
- Catholic Parish of Mary Immaculate

Education
- Thomas Reddall High School
- Westmead Public School
- Springwood High School
- Chifley Campus
- Parramatta West Public School
- Blacktown Tafe
- Wiley Park Girls High School
- Chester Hill High School
- Doonside High School
- Westfield Sports High
- Ingleburn High School
- Wenona School, North Sydney
- Granville Public School
- Bellevue Hill Public School
- Riverstone High School
- Mount Annan Public School
- Matthew Pearce Primary School
- Mount Druitt Tafe
- NirimbaTafe

Taylor Construction Group Pty Ltd
ABN 25 067 428 344

Level 13, 157 Walker St, North Sydney NSW 2060
T 02 8736 9000 F 02 8736 9090

taylorau.com.au

TAYLOR