

Long Term Environmental Management Plan

Tomago Resource Recovery Facility

REMONDIS Australia Pty Ltd

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1.0 Scope

The Long Term Environmental Management Plan (LTEMP) has been prepared to ensure appropriate environmental controls and management practices are followed during subsurface works within the affected area of the site (Figure 1). The LTEMP also outlines the mechanisms for legal enforceability, public notification, stakeholder responsibilities, record keeping, monitoring and revision.

The purpose of the LTEMP is to ensure site users are aware of the contaminated material requiring management at the site, and to document the nature and location of this material. This LTEMP is intended only to cover normal use and maintenance of the site as developed. A more comprehensive management plan should be prepared and approved by a site auditor and the appropriate regulatory authority, for any more significant disturbance of the site, if such activities are not adequately covered by the management procedures described in this LTEMP.

2.0 Objective of this Plan

The objectives of this LTEMP are to ensure that future subsurface site workers:

- Are aware of the existence of lead and zinc contaminated soil beneath the site;
- Understand the personal protective equipment (PPE) required to prevent exposure to lead contaminated soil; and
- Understand the environmental management procedures required to ensure that lead and zinc contaminated soil does not impact upon the health of site users and/or the environment.

The trigger to implement this LTEMP is any works that requires the white geofabric underlay to be penetrated in the truck parking area (See Photograph 1) or the plastic covers (and ultimately concrete cap) of the concrete bunkers to be penetrated. Refer to Figure 2 for these locations.



Photograph 1: Grey BIDIM A34G laid over lead and zinc impacted soil in the truck parking area

2.1 Document History

JM Environments (JME) were engaged to prepare a Long-Term Environmental Management Plan (LTEMP) for the management of lead and zinc contaminated soil remaining on site following the development of the REMONDIS Waste Recycling Facility at 21D and 21F School Drive, Tomago (the site). The site is identified as Lots 8 and 11 in Deposited Plan (DP) 270328 and Lot 2 DP1278541 as defined in the website maps.six.nsw.gov.au, and is approximately 3.9 hectares (ha) in area. The site location is shown in Figure 1.

The LTEMP was commissioned by REMONDIS Australia Pty Ltd, in accordance with the requirements of the Remediation Action Plan (RAP). It was prepared with reference to the NSW Environment Protection Authority (EPA) Guidelines for the NSW Site Auditor Scheme (3rd Edition).

2.2 Document Management

This document is intended to be a 'living document' to be reviewed and, where appropriate, updated or replaced, in the event of any redevelopment activity.

Any changes that would result in a reduction of management requirements must be approved by an accredited site auditor. The LTEMP must remain in place for as long as lead and zinc contaminated soil remains on site. Once lead and zinc contaminated soil has been successfully remediated or removed from the site, and validation of this remediation is complete, the LTEMP may be considered redundant, and removed from the REMONDIS Waste Recycling Facility's systems and documentary records.

The LTEMP is passive management system. Therefore, review of the LTEMP should be conducted every 5 years. The review must include the relevant changes in the Acts, Regulations, Guidelines and Codes of Practice referred to in this LTEMP. The review should be conducted by a suitably qualified and experienced environmental consultant.

Groundwater monitoring results (See Section 11.0) will be reviewed by REMONDIS annually. Increasing trends in zinc and PFAS groundwater concentrations would trigger an immediate review of the LTEMP.

3.0 Flowchart

Not applicable to this plan.

4.0 Stakeholders & Responsibilities

Primary responsibility for the LTEMP is the REMONDIS Australia Pty Ltd. A summary of responsibilities for subsurface works carried out within the LTEMP area is summarised in Table 2. For further queries contact the HSEQ Advisor Northern NSW on 4921 7636.

Table 2: Stakeholder Responsibilities

| Responsible | Responsibility |
|---|--|
| Remondis Hunter & Western NSW Region Manager | Maintain an up-to-date colour copy of the LTEMP onsite |
| | Integrate LTEMP into site standard operating procedure register |
| | Apply LTEMP for any subsurface works |
| | Provide contractors involved in subsurface works a copy of the LTEMP |
| | Maintain records of subsurface works carried out within the LTEMP area |
| | Ensure LTEMP is noted on 10.7 (2) Property Certificate for public notification |

REMONDIS/ Environmental Consultant Update and review the LTEMP as necessary

4.1 Users of the LTEMP

This document is to be retained and referred to by the REMONDIS (or similar) responsible for the Tomago Resource Recovery Facility. In addition, it will be made available to, and referred to by, site maintenance workers, contractors, or any other person whose duties may require subsurface excavation.

5.0 Statutory Requirements & Guidelines

This section outlines relevant legislative requirements and guidance documents that apply to the LTEMP. Users of the LTEMP should refer to any updates of the documentation that may occur, and use only the most up-to-date version.

5.1 Work Health & Safety Guidelines and Regulation

The following regulations and guidelines are referred to when considering obligations for worker safety.

5.1.1 NSW Work Health & Safety Act 2011

The main object of this Act is to provide for a balanced and nationally consistent framework to secure the health and safety of workers and workplaces by:

- protecting workers and other persons against harm to their health, safety and welfare through the elimination or minimisation of risks arising from work or from specified types of substances or plant, and
- providing for fair and effective workplace representation, consultation, co-operation and issue resolution in relation to work health and safety, and
- encouraging unions and employer organisations to take a constructive role in promoting improvements in work health and safety practices, and assisting persons conducting businesses or undertakings and workers to achieve a healthier and safer working environment, and
- promoting the provision of advice, information, education and training in relation to work health and safety, and
- securing compliance with this Act through effective and appropriate compliance and enforcement measures, and
- ensuring appropriate scrutiny and review of actions taken by persons exercising powers and performing functions under this Act, and
- providing a framework for continuous improvement and progressively higher standards of work health and safety, and
- maintaining and strengthening the national harmonisation of laws relating to work health and safety and to facilitate a consistent national approach to work health and safety in this jurisdiction.

Regard must be had to the principle that workers and other persons should be given the highest level of protection against harm to their health, safety and welfare from hazards and risks arising from work or from specified types of substances or plant as is reasonably practicable.

5.1.2 NSW Work Health & Safety Regulation 2017

Part 7.2 of the NSW Work Health and Safety Regulation 2017 provides definitions and directions for the management lead containing materials such as lead dust. Working with lead impacted soils may expose a person to lead dust which SafeWork NSW may consider to be a "lead process".

5.1.3 Management Guidelines

The following management guidelines should be referred to when there is the potential for lead contaminated soil to be exposed:

- Code of Practice-Excavation Work January 2020 NSW Government.

5.2 Environmental Management Guidelines, Regulations & Acts

These Regulations, Acts and guidelines are referred to when considering the management of Lead and zinc contaminated soils.

5.2.1 Protection of the Environment Operations (Waste) Regulation 1997

The Protection of the Environment Operations Act 1997 (POEO Act) establishes the regulatory framework regarding the protection of the environment in NSW. In particular, the Waste Regulation governs the disposal of lead contaminated soil waste generated on site to an appropriately licenced landfill.

5.2.2 Contaminated Land Management Act 1997

The general object of the Contaminated Land Management Act (the CLM Act) is to establish a process for investigating and (where appropriate) remediating land. In particular, it aims to ensure that contaminated land is managed with regard to the principles of ecologically sustainable development.

5.2.3 Environmental Planning and Assessment Act 1979

The Environmental Planning and Assessment Act 2017 ('EP&A Act') regulates development in NSW, and incorporates the principles of ecologically sustainable development through the EP&A Regulation 2021.

In accordance with the EP&A Act, the Section 10.7 certificate for the site should be updated to note that the site has been investigated and is subject to a Site Audit Statement and LTEMP.

5.2.4 Waste Classification Guidelines

The NSW EPA Waste Classification Guidelines Part 1: Classifying Waste (Nov 2014) describe a process for the classification of waste soil material that may be produced as a result of future excavations on the site. The Waste Classification Guidelines also provide a list of analytes and threshold values for the classification of waste soil material.

5.3 Planning Approval Conditions

The development of the REMONDIS Waste Recycling Facility was subject to the conditions of the Minister for Planning and Public Spaces consent of application SSD-10447.

Condition B17 required "Prior to the completion of the Site Audit Report and Site Audit Statement for the remediation works, the Applicant must prepare a Long-Term Environmental Management Plan (LTEMP) for the site. The LTEMP must:

- (a) be prepared by a suitably qualified and experienced consultant;
- (b) be reviewed and approved by the Site Auditor;

- (c) detail measures to identify and monitor contamination remaining on site;
- (d) detail the post-remediation groundwater monitoring program;
- (e) include a program for ongoing review to ensure that the LTEMP remains contemporary with relevant environmental standards;
- (f) include mechanisms to report results to Council and EPA."

Condition B18 required "Upon completion of the Site Audit Statement and Site Audit Report, the Applicant must:

- (a) implement the approved LTEMP;
- (b) provide evidence to the Planning Secretary the LTEMP is listed on the relevant planning certificate for the land, issued under section 10.7 of the EP&A Act, for the development."

6.0 Site Location & History

General site information is provided in Table 1.

Table 1: Summary of Site Details

| Site Aspect | Detail |
|---------------------|--|
| Site Address | 21D and 21F School Drive, Tomago NSW |
| Site Area | Approximately 3.9Ha |
| Site Identification | Lots 8 and 11 in Deposited Plan (DP) 270328 and Lot 2 DP1278541 at Tomago Local Government Area of Port Stephens Council Parish of Stockton County of Gloucester |
| Current Land Use | Resource Recovery Facility and Depot (See Figure 2) |
| Adjoining Land Use | Varley (mechanical engineer) directly west of the site and Tomago Aluminium Smelter further to the west; Vegetated and mostly unoccupied to the north and east; Vacant land with some commercial/industrial premises to the south, and North Channel Hunter River further to the south |
| Site Coordinates | Easting 381044, Northing 6367180 |
| Current Zoning | General Industrial |

6.1 Site History

The site lies on a former sand mine and hence it is likely that the top 3-4m has been disturbed and the heavy minerals been extracted. Post sand mining the site was part of a larger steel fabrication site. Metal cleaning and polishing via sand blasting was common practice for such a land use. Heavy minerals extracted from sand mining such as rutile and ilmenite were used as sandblasting media.

From 2012-2013 the western portion of site was redeveloped in the Midal Cables facility. The Midal Cables facility manufactured aluminium transmission cable from molten aluminium sourced from the nearby Tomago Aluminium Company (TAC) During construction of the Midal project, surface was classified as insitu General Solid Waste (GSW) and Excavated Natural Material (ENM) by JM Environments (JME). Due to the thickness of the concrete slabs and relatively short life of the facility it is considered very unlikely that the Midal operations impacted on the groundwater quality of the site with the exception of a former septic system in the southern portion of Lot 11 which is no longer in use.

The most significant lead contaminated soil was removed from site as part of remediation. In consultation with the NSW Department of Planning and the Accredited Site Auditor, it was decided that remaining lead and zinc contaminated soil could be consolidated and capped on site allowing effective managed under an LTEMP. Lead and zinc contaminated soils were consolidated under the truck parking area and in concrete bunkers (see Figure 2).

6.2 Site Geology and Hydrogeology

The site is located in Quaternary-aged alluvial and fluvial deposits associated with the meandering river valley of the Hunter River. As such, the site is underlain by sedimentary deposits comprising mixtures of sands, silts, clays, gravels and "Waterloo Rock".

Groundwater beneath the site is "fresh" and is part of the Tomago sand beds aquifer. Groundwater depth is generally 1-1.5m below the ground surface and varies in depth dependent on rainfall. Groundwater flows in a south south east direction. Groundwater entering the site along the northern boundary is contaminated with aluminium and fluoride that render the groundwater unsuitable to drink. The site groundwater has PFAS and zinc contamination that pose a potential risk to the local ecology. The PFAS and zinc concentration are expected to diminish over time. However, until such time the groundwater should not be extracted irrigation purposes.

7.0 Lead & Zinc Contamination Profile

Following remediation and redevelopment of the site, lead and zinc contaminated soil remains under the truck parking area (see Photograph 2) and in concrete pits (the consolidated areas), see Figure 2. The "as built" diagram of the truck parking area can be found in Appendix A. In the short term, the concrete pits are covered with plastic sheeting that is weighted down and enclosed with temporary fencing, marked with "No Entry" signs (see Photograph 3). In the long term REMONDIS will cover the concrete bunkers with concrete to suit the requirements of plant and equipment operating in that area. In future, when this area is concreted if any of the contaminated soil needs to be removed, it will be handled as per the requirements of the original Waste Classification.

The consolidated areas contain soils with zinc concentrations that range from 282mg/kg to 33,000mg/kg and lead concentrations that range from 51mg/kg to 4,340mg/kg. The relevant sections of JM Environments (2022) Remediation Validation Assessment 21D and 21F School Drive Tomago (ref: JME20005-8) can be found in Appendix B.



Photograph 2: View from the eastern end of the truck parking area



Photograph 3: Plastic covering Concrete Pit 2.

8.0 Health & Environmental Risks

8.1 Hazards Identified

The following potential health and environmental hazards have been identified:

- Lead exposure to subsurface workers interacting with lead contaminated soil.
- Zinc exposure to the surrounding ecology interacting with groundwater.

8.2 Lead

Lead (Pb) is a naturally occurring element found in the Earth's crust at an average concentration of approximately 15 to 20 mg/kg. Lead is a bluish-grey, soft, dense, malleable, corrosion-resistant metal that is solid at room temperature and has a low melting point. It exists in three oxidation states—Pb (0) (metallic lead), Pb (II) and Pb (IV). The most common oxidation state of lead is Pb (II).

Lead is of primary use in a wide range of materials including batteries, metal alloys, X-ray shielding materials, ammunition, chemical-resistant linings and pigments. Lead has been widely used historically as an additive in petrol and also in many paints.

As a result of the presence of lead in the consolidated areas there is a risk of exposure to lead during soil disturbance. The National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPM) Volume 2 Schedule B1 Guideline On Investigation Levels For Soil and Groundwater set the acceptable level of lead in soil to be 1,500 mg/kg in a commercial/industrial

setting. Two separate stockpiles of soils were assessed for lead prior to placing them under the truck carpark and into the concrete pits. The lead concentrations in the stockpiles were:

- Stockpile 1:
 - Highest lead concentration: 672mg/kg
 - Lowest lead concentration: 51mg/kg
 - Average lead concentration: 307mg/kg
 - The 95% Upper Confidence Limit for the average concentration: 355mg/kg
- Stockpile 2:
 - Highest lead concentration: 4340mg/kg
 - Lowest lead concentration: 26mg/kg
 - Average lead concentration: 570mg/kg
 - The 95% Upper Confidence Limit for the average concentration: 1038mg/kg

The 95% Upper Confidence Limit for the average concentration is the statistic normally compared to HILs. On this basis the lead on soil is considered low risk to human health but should be managed to mitigate the risk further.

Ingestion of soil and dust is considered the most significant pathway of exposure for inorganics in soil. Inhalation of dust particulates is also considered a significant exposure pathway. Dermal absorption of inorganic is negligible.

Health effects associated with exposure to inorganic lead and compounds include, but are not limited to, neurotoxicity, developmental delays, hypertension, impaired haemoglobin synthesis, and male reproductive impairment. The most sensitive targets for lead toxicity are the developing nervous system, the haematological and cardiovascular systems and the kidney. However, due to the multi-modes of action of lead in biological systems, lead could potentially affect any system or organ in the body. The effects of lead exposure have often been related to the blood lead content, which is generally considered to be the most accurate means of assessing exposure.

The NEPM also provides Ecological investigation levels (EILs) for the protection of terrestrial ecosystems. The EIL for lead in soil is 1,800mg/kg and hence lead in soil is not considered an ecological risk.

8.3 Zinc

Zinc is ubiquitous in the environment and occurs in the Earth's crust at an average concentration of about 70 mg/kg. Zinc is not found in elemental form in nature, and occurs in the +2 oxidation state primarily as various minerals such as sphalerite (zinc sulphide), smithsonite (zinc carbonate), and zincite (zinc oxide). Fifty-five zinc-containing minerals are known to exist. In its pure elemental (or metallic) form, zinc is a bluish-white shiny metal.

Zinc oxide is used in the rubber industry as a vulcanisation activator and accelerator and to slow down oxidation, and also as a reinforcing agent, heat conductor, pigment, UV stabiliser, supplement in animal feeds and fertilisers, catalyst, chemical intermediate, and mildew inhibitor. Zinc sulphate is used in rayon manufacture, agriculture, zinc plating, and as a chemical intermediate and mordant. Zinc chloride is used in smoke bombs, in cements for metals, in wood preservatives, in flux for soldering, in the manufacture of parchment paper, artificial silk, and glues, as a mordant in printing and dye textiles, and as a deodorant, antiseptic and astringent. Zinc chromate is used as a pigment in paints, varnishes, and oil colours. In addition, zinc phosphide is used as a rodenticide while zinc cyanide is used in electroplating.

Zinc is a well-studied inorganic contaminant. The NEPM presents toxicity data for nine soil process, 14 invertebrate species and 1 invertebrate community measurement and 22 plant species. Zinc is an essential element and, as such, concentrations of Zn in tissue are highly regulated and it does not biomagnify.

As a result of the presence of zinc in the consolidated areas there is a risk of exposure to zinc during soil disturbance. The NEPM sets the acceptable level of zinc in soil to be 400,000 mg/kg for human health in a commercial/industrial setting. Two separate stockpiles of soils were assessed for zinc prior to placing them under the truck carpark and into the concrete pits. The zinc concentrations in the stockpiles were:

- Stockpile 1:
 - Highest zinc concentration: 739mg/kg

- Lowest zinc concentration: 939mg/kg
- Average I zinc concentration: 4056mg/kg
- The 95% Upper Confidence Limit for the average concentration: 4537mg/kg
- Stockpile 2:
 - Highest zinc concentration: 33000mg/kg
 - Lowest I zinc concentration: 282mg/kg
 - Average zinc concentration: 5402mg/kg
 - The 95% Upper Confidence Limit for the average concentration: 9071mg/kg

The 95% Upper Confidence Limit for the average concentration is the statistic normally compared to HILs. The zinc concentrations are significantly below HILs and as such consolidated zinc impacted soils do not pose a significant risk to the health of site workers and visitors.

The NEPM also provides method to derive an ecological investigation level (EILs) for zinc for the protection of terrestrial ecosystems. The EIL for zinc in soil on the site was derived to be 480mg/kg and hence zinc in soil is considered an ecological risk.

8.4 What existing control measures are being applied?

Stockpile 1 and part of Stockpile 2 was placed under the parking area, along with contaminated soil from the Onsite Stormwater Detention Pit. The majority of Stockpile 2 and Stockpile 3 were placed in the concrete pits.

Lead and zinc contaminated soil has been covered with a low permeability barrier in the truck parking area and entombed in concrete bunkers, effectively preventing the exposure of lead to site workers and infiltration of stormwater and migration of zinc contamination via groundwater flow. For the short term, the concrete bunkers are covered with plastic. It is planned to seal the concrete bunkers with concrete when REMONDIS identify what plant and equipment will be used in this area of Building 1. The concrete bunkers are isolated from workers by temporary fencing with warning signage which will remain until the bunkers are sealed with concrete.

Should it be required to penetrate the low permeability barrier in the truck parking area or the concrete bunkers and expose lead and zinc contaminated soil, control measures as described in Section 11 should be implemented.

9.0 Environmental Management Plan

This LTEMP is a passive system of management.

9.1 Management Control Procedures

The lead and zinc contaminated soil is not expected to be disturbed under normal use and maintenance of the site. The integrity of the truck parking hardstand and cover of the concrete bunkers will be assessed on quarterly basis. The integrity of the truck parking hardstand will also be assessed after periods of significant rainfall. Where lead and zinc contaminated soil is uncovered, or when there is deemed to be an increased risk of exposure to workers, the below procedures shall be implemented.

9.1.1 Maintenance of Covering Layers

Covering layers (BIDIM marker layer, and hardstand/slab or the plastic covering the concrete pits) should be maintained in good condition, to reduce potential for exposure of contamination.

The truck parking hardstand surface must be maintained to minimise stormwater pooling and allow drainage to the onsite stormwater detention basin. The thickness of truck parking area must be maintained, and any ruts or potholes reinstated with ABBR FCR 4 % Stabilment or similar material.

9.1.2 Planning of Works

The method of works should be planned so that risks to workers, occupants and the public can be assessed and minimised. A suitably qualified and experienced environmental consultant must be engaged to ensure appropriate site preparations are made including a review of the subcontractors Safe Work Method Statement (SWMS).

If it is necessary to expose lead and zinc contaminated soil, the following process should be followed:

1. REMONDIS agree the scope of works for potential disturbance of the entombed soil.
2. Agree appropriate risk management and sequence of works.
3. Perform Site Induction (Section 11.1.3);
4. Demarcate and secure work area (see Section 11.1.4);
5. Implement PPE and hygiene requirements (see Section 11.1.5);
6. Undertake works including excavation, dust control and stockpile management (see Section 11.1.6);
7. Reinstate excavation and marker layer (see Section 11.1.7);
8. Reinstate truck parking hardstand or concrete slab (see Section 11.1.8);
9. Classify waste for disposal if necessary (see Section 11.1.9); and
10. Dispose of waste material (see Section 11.1.10).

9.1.3 Site Induction

Prior to commencing works, personnel shall undergo a site induction. The induction should be delivered by REMONDIS and include specific reference to this LTEMP.

9.1.4 Demarcated and Secure Work Area

A designated work area around excavations must be set up. The designated work area must be inspected and approved by the suitably qualified and experienced environmental consultant prior to the commencement of the works.

Appropriate signs should be clearly displayed on the designated work area barriers. The barriers and signs should remain in place until the works are complete (including waste removal). To prevent the spreading of contaminated material, all PPE should be removed in the work area.

9.1.5 Personal Protective Equipment and Hygiene

To minimise health risks associated with potential exposure to contaminants, the minimum level of PPE required for persons undertaking the excavations includes:

- Long sleeved shirt and trousers;
- Steel capped work boots;
- Safety glasses;
- Respiratory PPE;

Workers with an increased risk of exposure to contaminated soils should utilise hygiene practices appropriate to their tasks, including the following:

- Eating, drinking, chewing gum or tobacco, smoking or practices that involve hand to mouth transfer increase the probability of ingestion of contaminated soil or dust into the body. Hands must be thoroughly washed after coming into contact with soil on the site before eating, drinking or smoking.
- Smoking will be prohibited in the work area.

9.1.6 Undertaking works – Controls for Excavations, Dust and Stockpile Management

Controls for Excavation

When excavating into the LTEMP areas the following requires consideration:

- Presence of underground utilities;
- Site security/ labelling;
- Excavation stability;
- Dust control procedures
- Established PPE decontamination area;
- Procedure for securing and stockpiling soil
- Soil waste disposal / Waste classification
- Requirement for Importation of fill
- Cap reinstatement

Dust Control

Dust control should act to minimise dust creation and its movement off-site. For the purpose of dust control the following measures should be implemented if feasible:

- Visual monitoring of dust levels during site work;
- Wetting down of lead and zinc contaminated soils where safe to do so; and
- minimising access to contaminated areas;

Stockpile Management

When contaminated soils are to be excavated, the following recommendations are provided to manage stockpiled material:

- Contaminated soil must only be placed in areas of existing contamination or on concrete hardstand. It must not be placed over uncontaminated soil unless a suitable separation layer (eg. heavy duty plastic or geofabric) is in place;
- Material types should be segregated to avoid mixing uncontaminated and contaminated soil;
- If excavated material is to be reinstated on site, it can only go back to the location and depth from which it came;
- Stockpiles should be managed in such a way as to prevent harm to the environment and general public from contaminated soils within the stockpiles;
- Access to stockpiles of contaminated material should be limited by keeping stockpiles within site fences;
- Stockpiles should be placed on level ground. If this is not possible, stockpiles should not be placed on slopes greater than 5°;
- Material should be placed on strong impermeable plastic sheeting to prevent the contamination of underlying soils. Material should not be stockpiled more than 2m high;

- Once the soils have been stockpiled, the stockpiles should be covered by polythene sheets or tarpaulins to prevent erosion of stockpiled materials. Heavy objects without sharp edges should be placed on the sheets to prevent them from being blown by wind;
- Adequate straw bales and/or silt fences should be placed around the perimeter of the stockpile areas to filter runoff from the stockpiles and prevent overland stormwater flow from affecting the base of the stockpile; and
- A diversion trench should be excavated, or tightly packed sand bags placed, up-gradient of the stockpile to prevent stormwater from running into the stockpile.

9.1.7 Reinstatement excavation and marker layer

Planned works must ensure that the marker layer (BIDIMA34G) is reinstalled as per the Qualitest Design Report (See Appendix C) and/or a suitable alternative designed to ensure that the potential lead and zinc risk is managed consistently with this plan following the works conducted. Locations of the new marker layer should be surveyed, and the LTEMP updated accordingly.

9.1.8 Reinstatement truck parking hardstand or concrete slab

Planned works must ensure that the truck parking hardstand (reinstated with ABBR FCR 4% Stabilment or similar material)/concrete slab are reinstated and/or a suitable alternative is designed to ensure that the potential lead and zinc risk is managed consistently with this plan following the works conducted.

9.1.9 Disposal of Soil

Excavated soil material destined for off-site disposal must first be classified in accordance with the NSW EPA (2014) Waste Classification Guidelines, and must be disposed of at a suitably licensed landfill facility.

If soil material is to be transported to or from site, records are to be kept of truck movements, including:

- Truck registration;
- Start journey time;
- Finish journey time;
- Origin;
- Destination;
- Tonnage; and
- Records of disposal of waste to an appropriately licensed facility.

9.1.10 Importation of Soil

If it is necessary to import material to backfill trenches or excavations, imported material must either classify as virgin excavated natural material (VENM), as defined in the NSW EPA (2014) Waste Classification Guidelines (or any update as may occur), satisfy another suitable general or specific EPA exemption, or be landscaping material, conforming with Australian Standard AS4419-2003 Soils for landscaping and garden use (or any update as may occur). Imported material must be classified at the point of origin, and be delivered to site directly from the point of origin. A copy of the validation letter must be reviewed and approved by an appropriately qualified environmental consultant prior to delivery of the material.

10.0 Accidental Exposure

Accidental or inadvertent exposure of lead and zinc contaminated soils should be immediately reported to the REMONDIS Waste Recycling Facility HSEQ management and incident response procedures should be implemented consistent with the procedures referenced in the Integrated Management Plan. If contaminated soils have been excavated or encountered, then PPE, dust control and correct disposal procedures should be implemented.

11.0 Monitoring & Reporting

11.1 Monitoring

The remediation strategy of zinc impacted soil was to consolidate zinc impacted soil in areas where stormwater would not infiltrate through it. The aim was to reduce the mobilisation of zinc into groundwater and reduce the potential exposure risk of the local ecology to zinc. To assess the ongoing effectiveness of the remedial strategy, groundwater monitoring will be required to be undertaken. Per- and polyfluoroalkyl substances impacts were also identified in the site's groundwater but not in the site's soils during a previous contamination assessment. It was considered the PFAS in groundwater would self-attenuate overtime. On this basis, the groundwater will be monitored for zinc, lead and PFAS compounds. The existing groundwater well network consisting of monitoring wells MW4-MW10 will be utilised, as shown in Figure 3.

Groundwater should not be extracted for any purpose (e.g. irrigation) unless it is verified as suitable for that purpose.

Sampling of the monitoring wells will be conducted in accordance with the following protocols:

- Prior to purging, the presence or absence of phase separated hydrocarbons (PSH) and depth to groundwater will be measured using an oil-water interface probe;
- Prior to sampling, each well will be purged using a low flow peristaltic pump until uniform turbidity is (visually) obtained, and field water quality parameters (electrical conductivity (EC), pH and temperature) have stabilised to within 10% difference for three successive readings at least three minutes apart. If water quality parameters do not stabilise, groundwater will not be sampled until at least three times the volume of the sampling equipment has been purged; and
- Field measurements - pH, EC, temperature, dissolved oxygen (DO) and redox potential (Eh) – will be recorded during purging using equipment confirmed not to impact water quality.
- Equipment coming into contact with the groundwater samples must be certified as PFAS free;
- A sampling train blank must be collected using PFAS free water. Note: the site tap water cannot be used;
- A field duplicate will be collected and analysed each round of monitoring;
- Samples will be placed into
- Samples do not require ice for transport to the laboratory;
- The laboratory must NATA accredited for the analysis of zinc and PFAS in groundwater.

Groundwater monitoring will commence as soon as practicable after the completion of the remediation of site and will be undertaken as required by the site's environmental protection licence EPL21636 (see Appendix D). Monitoring may be requested to cease when a statistical (e.g. Mann-Kendall) downward trend of zinc and PFAS concentration can be demonstrated. The request to cease the monitoring must be made in writing to the NSW EPA. The monitoring parameters and frequency are summarised in Table 2.

Table 2: Groundwater Monitoring Requirements

| Monitoring Requirement | Detail |
|--|--|
| Monitoring Frequency | Monthly |
| Monitoring Points | MW4-MW10 as shown on Figure 3 |
| Field Parameters | pH, EC, temperature, dissolved oxygen (DO) and redox potential (Eh) |
| Laboratory analysis (limit of reporting) | Arsenic (1µg/L) Cadmium (0.1µg/L) Chromium (1 µg/L) Copper (1 µg/L) Lead (1 µg/L) Zinc (5 µg/L) PFOS (0.0002µg/L) PFOA (0.0005µg/L) PFHxS (0.0005µg/L) |

Groundwater results will be compared to historical groundwater monitoring from the site to assess the remediation strategy.

The groundwater monitoring results will be reported to the NSW EPA as part of the sites environmental protection licence annual returns and an annual groundwater monitoring report will be prepared that will report on the monitoring work undertaken, the analytical results, review and comment on the QA/QC and comment on statistically identifiable trends in the results. In order to satisfy condition B17(f) of the development consent, REMONDIS will provide a copy of the annual report to Port Stephens Council.

11.2 Records to be retained

Records of inspections and actions taken as part of the monitoring must be maintained by the REMONDIS Waste Recycling Facility management. A dedicated logbook, folder or file is required to be maintained by each entity/person responsible for monitoring and reporting, which should include documents relating to contamination management at the site. The documentation would include, but not be limited to:

- Induction/training records of subsurface workers on the LTEMP;
- Correspondence/communication logs;
- Plans and sketches of locations, extent and depth of disturbance;
- Licences and approvals;
- Photographs of work;
- Material tracking and disposal docket;
- Consultant reports;
- Soil monitoring results;
- Complaints;

- Incident Reports; and
- Inspection and corrective action logs.

12.0 References

- JM Environments (2022) Remediation Validation Assessment 21D and 21F School Drive Tomago (ref: JME20005-8)
- National Environment Protection (Assessment of Site Contamination) Measure 1999 Volume 10 Schedule B7 Appendix A1. The Derivation of HILs for Metals and Inorganics
- National Environment Protection (Assessment of Site Contamination) Measure 1999 Volume 8 Schedule B5c Ecological Investigation Levels for Arsenic, Chromium (III), Copper, DDT, Lead, Naphthalene, Nickel & Zinc
- NSW Contaminated Land Management Act (1997)
- NSW Environmental Planning and Assessment Act 1979
- NSW Environment Protection Agency (2017) Guidelines for the NSW Site Auditor Scheme - Contaminated Land Management (3rd Edition)
- NSW EPA (2014) Waste Classification Guidelines Part 1: Classifying Waste
- NSW Environmental Planning and Assessment Act 1979
- NSW Environmental Planning and Assessment Regulation 2021
- NSW EPA (2020) Guidelines for Consultants Reporting on Contaminated Sites
- NSW Protection of the Environment Operations Act (1997)
- NSW Protection of the Environment Operations (Waste) Regulation (1997)
- NSW Work Health and Safety Regulation (2017)
- Google Earth
- maps.six.gov.nsw.au

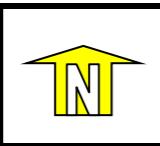
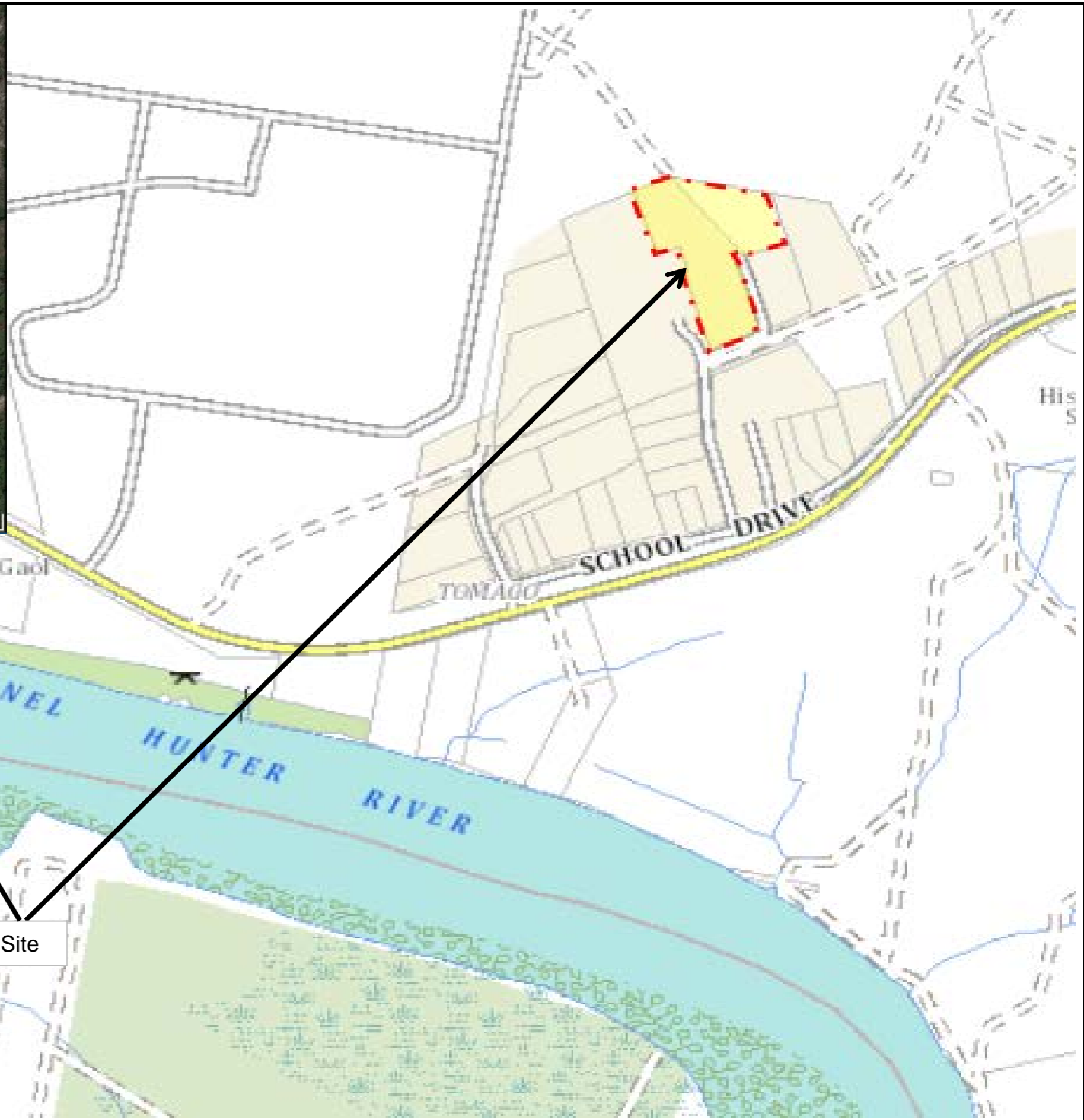
13.0 Attachments

13.1 Acronyms

- ACM asbestos containing material
- CLM Act Contaminated Land Management Act 1997
- DP Deposited Plan
- EP&A Act NSW Environmental Planning and Assessment Act 1979
- EPA Environment Protection Authority
- HMR Hazardous Materials Register
- HSL health screening level

- JME JM Environments
- LTEMP Long Term Environmental Management Plan
- mbgl metres below ground level
- NEPM National Environment Protection (Assessment of Site Contamination) Measure 1999
- NOHSC National Occupational Health and Safety Committee
- POEO Act Protection of the Environment Operations Act 1997
- PPE personal protective equipment
- SWMS Safe Work Method Statement
- VENM virgin excavated natural material

13.2 Figures



CLIENT: REMONDIS
 PROJECT TITLE: School Drive, Tomago

| | |
|-----------|-----------|
| PROJECT: | JME20005 |
| DWG #: | 1 |
| REVISION: | 1 |
| SCALE: | As shown |
| DATE: | 9/12/2021 |

| | |
|-----------|-----|
| DESIGNED: | JMc |
| DRAWN: | JMc |
| STATUS: | NFC |

FIGURE TITLE:
Site Location Plan
 FIGURE NUMBER: 1



CLIENT: REMONDIS

PROJECT TITLE: School Drive, Tomago

PROJECT: JME20005

DWG #: 1

REVISION: 1

SCALE: As shown

DATE: 9/12/2021

DESIGNED: JMc

DRAWN: JMc

STATUS: NFC

FIGURE TITLE:
Locations of Consolidated Lead and Zinc Contaminated Soil

FIGURE NUMBER: 2



CLIENT: Remondis
 PROJECT TITLE: School Drive, Tomago

PROJECT: JME20005
 DWG #: 1
 REVISION: 1
 SCALE: As shown
 DATE: 9/12/2021

DESIGNED: JMc
 DRAWN: JMc
 STATUS: NFC

FIGURE TITLE:
Monitoring Well Locations
 FIGURE NUMBER: 3

13.3 Appendices

Appendix A: Truck Parking Area "As Built" Diagram

LEGEND

- DENOTES SITE BOUNDARY LINE
- DENOTES EXISTING TO BE DEMOLISHED
- DENOTES TRAFFICABLE PAVEMENT, REFER TO DETAIL
- DENOTES KERB ONLY, REFER TO DETAIL
- PROPOSED FENCE, REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS
- DENOTES PROPOSED FINISHED SURFACE LEVEL
- DENOTES EXISTING SURFACE LEVEL
- DENOTES MATCH TO EXISTING LEVELS
- DENOTES EXISTING CONTOURS
- DENOTES APPROXIMATE BATTER EXTENTS. PROVIDE 100mm TOPSOIL AND TURF TO BATTERS OR SIMILAR AS DIRECTED BY SUPERINTENDENT
- DIRECTION OF FALL IN FINISHED SURFACE
- DENOTES STORMWATER PIT (NEW / EXISTING)
- DENOTES STORMWATER PIT TO BE FITTED WITH 200um OCEAN PROTECT PIT FILTER INSERT WITH HYDROCARBON ABSORBENT PILLOW/OIL SOCK
- DENOTES BELOW GROUND ON-SITE DETENTION AND INFILTRATION SYSTEM. REFER TO DETAIL
- DENOTES STORMWATER LINE
- DENOTES EXISTING STORMWATER LINE
- DENOTES OVERLAND FLOW PATH
- DENOTES APPROXIMATE LOCATION OF EXISTING ELECTRICITY LINE

LOCATIONS OF EXISTING SERVICES ARE APPROXIMATE ONLY & MAY NOT BE COMPLETE. THE BUILDER IS RESPONSIBLE FOR LOCATING EXISTING INFRASTRUCTURE (CULVERTS, PITS, PIPES, SERVICES, INVERT & COVER LEVELS ETC) PRIOR TO COMMENCING CONSTRUCTION.

THE BUILDER SHALL ALLOW TO MODIFY ALL EXISTING SERVICE COVERS TO MATCH THE NEW PAVEMENTS, IN ACCORDANCE WITH THE RELEVANT AUTHORITIES REQUIREMENTS.

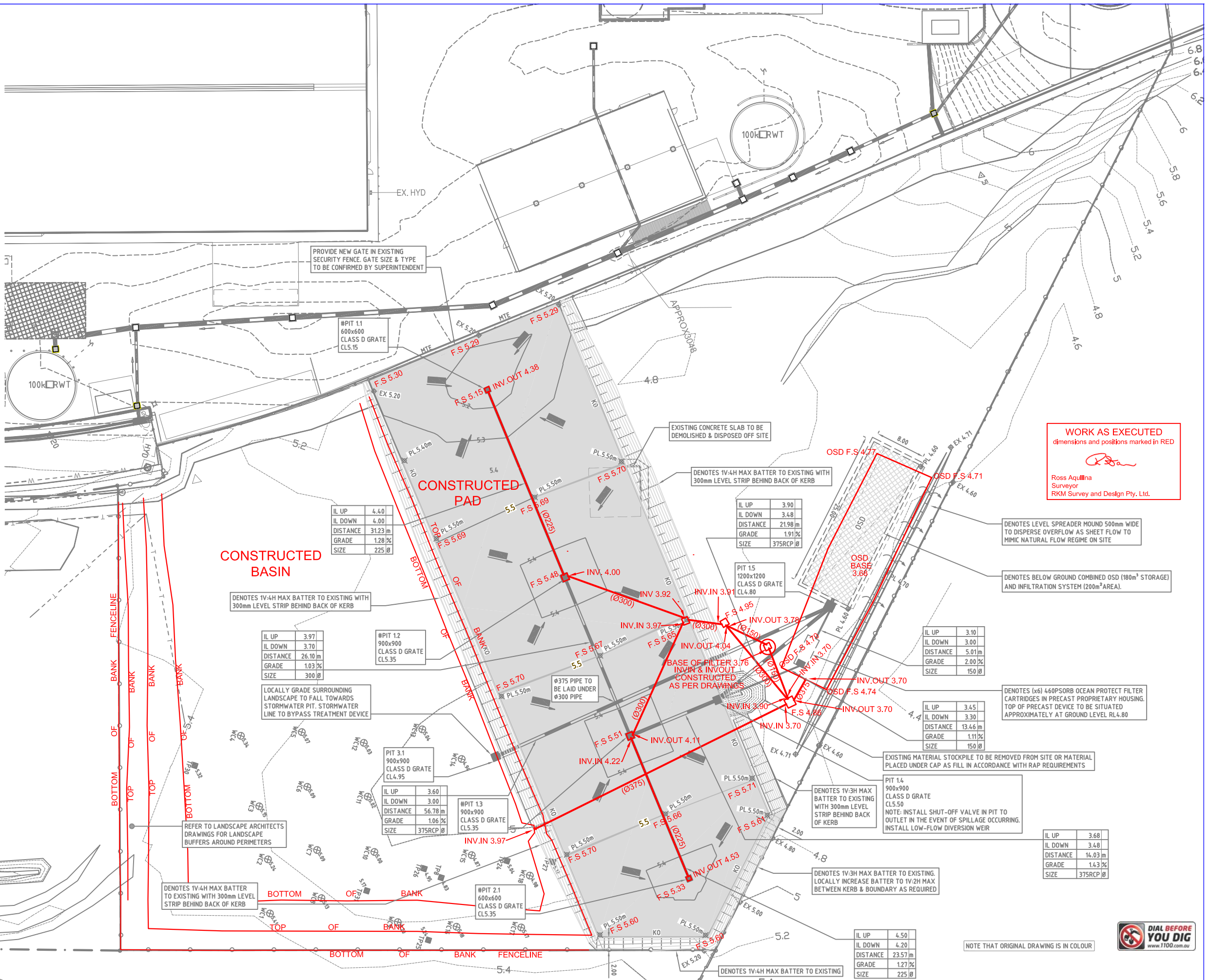
PROVIDE TEMPORARY TRAFFIC CONTROL IN ACCORDANCE WITH STATE & FEDERAL STATUTORY REQUIREMENTS AND LOCAL COUNCIL SPECIFICATIONS/REQUIREMENTS

NOTE: EXISTING STORMWATER DRAINAGE, RAINWATER TANKS AND INFILTRATION/DETENTION TANKS FOR 21D LOT11 TO BE RETAINED

NOTE: DRAWINGS TO BE READ IN CONJUNCTION WITH SOIL & WATER MANAGEMENT REPORT

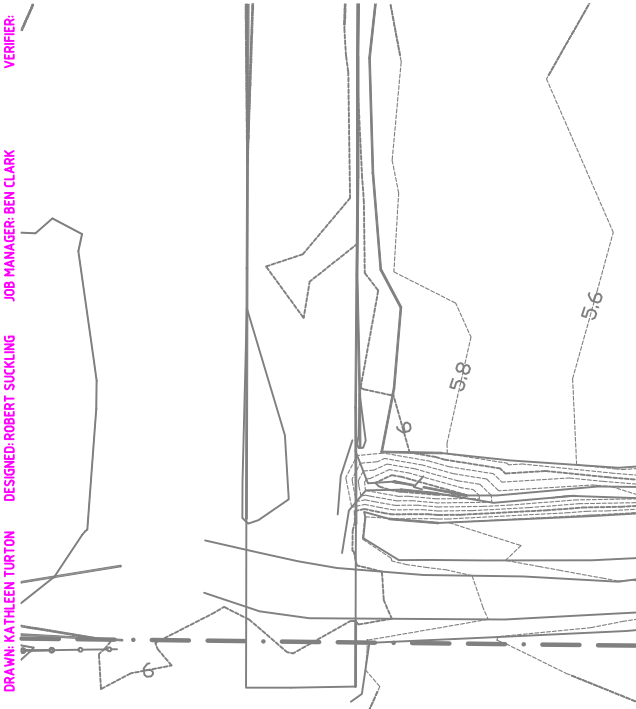
STORMWATER MANAGEMENT SUMMARY

| | DEVELOPMENT SCENARIO 1 |
|------------------|---|
| DETENTION VOLUME | 180m ³ |
| | 200m ² INFILTRATION AREA |
| WATER QUALITY | (x4) PIT FILTER INSERTS (x6) FILTER CARTRIDGES |



WORK AS EXECUTED
dimensions and positions marked in RED

Ross Aquilina
Ross Aquilina
Surveyor
RKM Survey and Design Pty. Ltd.



| REVISION | DESCRIPTION | ISSUED | VER'D | APP'D | DATE |
|----------|--------------------------|--------|-------|-------|----------|
| A | CONSTRUCTION CERTIFICATE | KT | | BC | 16.11.21 |
| | WAE | | | RA | 28.03.22 |

DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED

THE COPYRIGHT OF THIS DRAWING REMAINS WITH NORTHROP CONSULTING ENGINEERS PTY LTD.

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Email centralcoast@northrop.com.au ABN 81 094 433 100

PROJECT
REMONDIS RESOURCE RECOVERY FACILITY & TRUCK PARKING DEPOT 21D & 21F SCHOOL DRIVE, TOMAGO

DRAWING TITLE
INTERNAL CIVIL WORKS CIVIL WORKS PLAN

| | |
|-------------------------|-----------------|
| JOB NUMBER | NL201175 |
| DRAWING NUMBER | C4.1 |
| REVISION | A |
| DRAWING SHEET SIZE = A1 | |



DRAWN: KATHLEEN TURTON DESIGNED: ROBERT SUCKLING JOB MANAGER: BEN CLARK VERIFIER:

Appendix B: Relevant Contamination Information from JM Environments (2022) Remediation Validation Assessment 21D and 21F School Drive Tomago

under the guidance of a JME scientist. Gleasons continued the excavation with periodic guidance from JME until completion of the excavation 17 December 2021. Material excavated on 13th and 14th December were stored in stockpile SP1. The excavation that generated stockpile SP1 is shown in Figure 4. Material excavated on 15, 16 and 17 were stored in stockpile SP2. The excavation that generated stockpile SP2 is shown in Figure 4. The two stockpiles were surveyed. The volume of stockpile SP1 was 558.7m³ and the volume of stockpile SP2 was 1233.9m³.

6.7 Validation of Zinc Impacted Stockpiles

Stockpiles SP1 and SP2 were sampled and analysed for zinc to assess their suitability to be reinstated into the excavation they were generated from. These validation samples were also analysed for lead as some of the material was excavated from the area around the lead hotspots. Zinc stockpile SP1 was judged to contain approximately 800m³ (note: the survey data in Section 6.12.1 was not available at the time of sampling). Thirty-two primary samples were collected from the stockpile using an excavator (See Photograph 3) on 16 December 2021. Zinc Stockpile

SP2 was judged to contain 1,200m³. Forty-eight primary samples were collected from the stockpile on 22 December 2021.

The zinc stockpile validation results are summarised in Summary Table 3 and the laboratory results are in Appendix C.



Photograph 3: Sampling Zinc stockpile SP1, 16 December 2021.

The zinc and lead concentration for each stockpile is summarised in Summary Table 5 and 6 (attached). These results are further summarised in Table 6 below. The results indicate that the zinc impacted stockpiles were not suitable to reinstate into the excavation they were generated from.

Table 6: Zinc Stockpiles Summary results

| | Zinc Stockpile SP1 | | Zinc Stockpile SP2 | |
|-----------------------|--------------------|--------------|--------------------|--------------|
| | Zinc (mg/kg) | Lead (mg/kg) | Zinc (mg/kg) | Lead (mg/kg) |
| Maximum concentration | 7,390 | 672 | 33,000 | 4340 |
| Minimum concentration | 939 | 51 | 282 | 26 |
| UCL95 Concentration | 4,537 | 355 | 9,071 | 1038 |



Summary Table 4
Zinc Stockpile SP1

| Analyte | Units | Adopted DGV | Sample ID | SP1-1 | VQC4 | Relative | VQC4A | Relative | SP1-2 | SP1-3 | SP1-4 | SP1-5 | SP1-6 | SP1-7 | SP1-8 | SP1-9 | SP1-10 |
|----------|-------|-------------|-----------------|-------------|-------------|------------|-------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | | | Sample Date | 17/12/2021 | 17/12/2021 | Percentage | 17/12/2021 | Percentage | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 |
| | | | Location | Stockpile 1 | Stockpile 1 | Difference | Stockpile 1 | Difference | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 |
| | | | Reporting Limit | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result |
| Zinc, Zn | mg/kg | 810 | 5 | 2270 | 5090 | 77% | 2500 | 10% | 7220 | 6490 | 1810 | 4110 | 2880 | 2320 | 3040 | 939 | 1760 |
| Lead, Pb | mg/kg | 1500 | 5 | 89 | 499 | 139% | 120 | 30% | 390 | 245 | 63 | 52 | 116 | 75 | 260 | 87 | 126 |

| Analyte | Units | Adopted DGV | Sample ID | SP1-11 | SP1-12 | SP1-13 | SP1-14 | SP1-15 | SP1-16 | SP1-17 | SP1-18 | SP1-19 | SP1-20 | VQC5 | Relative | VQC5A | Relative |
|----------|-------|-------------|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|------------|
| | | | Sample Date | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | Percentage |
| | | | Location | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Difference | Stockpile 1 | Difference |
| | | | Reporting Limit | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result |
| Zinc, Zn | mg/kg | 810 | 5 | 4940 | 1360 | 4070 | 4420 | 5190 | 4590 | 3630 | 4060 | 2840 | 4110 | 4900 | 18% | 4400 | 7% |
| Lead, Pb | mg/kg | 1500 | 5 | 381 | 51 | 310 | 319 | 396 | 398 | 336 | 498 | 283 | 615 | 672 | 9% | 420 | 38% |

| Analyte | Units | Adopted DGV | Sample ID | SP1-21 | SP1-22 | SP1-23 | SP1-24 | SP1-25 | SP1-26 | SP1-27 | SP1-28 | SP1-29 | SP1-30 | SP1-31 | SP1-32 |
|----------|-------|-------------|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | | | Sample Date | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 | 17/12/2021 |
| | | | Location | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 | Stockpile 1 |
| | | | Reporting Limit | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result |
| Zinc, Zn | mg/kg | 810 | 5 | 4280 | 4460 | 5390 | 4890 | 3820 | 7390 | 4860 | 6660 | 4160 | 5100 | 2900 | 3830 |
| Lead, Pb | mg/kg | 1500 | 5 | 236 | 493 | 508 | 472 | 380 | 369 | 434 | 487 | 313 | 389 | 254 | 352 |



Summary Table 5
Zinc Stockpile SP2

| Analyte | Units | Adopted RAC | Reporting Limit | Sample ID | SP2-1 | SP2-2 | SP2-3 | SP2-4 | SP2-5 | VQC10 | Relative | VQC10A | Relative | SP2-6 | SP2-7 | SP2-8 |
|----------|-------|-------------|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|------------|-------------|-------------|-------------|
| | | | | Sample Date | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | Percentage | 22/12/2021 | Percentage | 22/12/2021 |
| | | | | Location | Stockpile 2 | Stockpile 2 | Stockpile 2 | Stockpile 2 | Stockpile 2 | Stockpile 2 | Difference | Stockpile 2 | Difference | Stockpile 2 | Stockpile 2 | Stockpile 2 |
| Zinc, Zn | | 810 | 5 | Result | 13400 | 11800 | 8090 | 3930 | 2690 | 2490 | 8% | 2800 | 4% | 3440 | 6580 | 2370 |
| Lead, Pb | mg/kg | 1500 | 5 | Result | 1100 | 1040 | 1140 | 346 | 234 | 242 | 3% | 197 | 17% | 302 | 622 | 471 |

| Analyte | Units | Adopted RAC | Reporting Limit | Sample ID | SP2-9 | SP2-10 | SP2-11 | SP2-12 | SP2-13 | SP2-14 | SP2-15 | SP2-16 | SP2-17 | SP2-18 | SP2-19 | SP2-20 |
|----------|-------|-------------|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | | | | Sample Date | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 |
| | | | | Location | Stockpile 2 | Stockpile 2 | Stockpile 2 | Stockpile 2 | Stockpile 2 | Stockpile 2 | Stockpile 2 | Stockpile 2 | Stockpile 2 | Stockpile 2 | Stockpile 2 | Stockpile 2 |
| Zinc, Zn | | 810 | 5 | Result | 2460 | 2530 | 1650 | 2140 | 3150 | 2880 | 2460 | 5870 | 3960 | 538 | 3060 | 3660 |
| Lead, Pb | mg/kg | 1500 | 5 | Result | 264 | 541 | 218 | 178 | 273 | 360 | 178 | 559 | 291 | 49 | 376 | 283 |

| Analyte | Units | Adopted RAC | Reporting Limit | Sample ID | SP2-21 | VQC11 | Relative | VQC11A | Relative | SP2-22 | SP2-23 | SP2-24 | SP2-25 | SP2-26 | SP2-27 | SP2-28 | SP2-29 |
|----------|-------|-------------|-----------------|-------------|-------------|-------------|------------|-------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | | | | Sample Date | 22/12/2021 | 22/12/2021 | Percentage | 22/12/2021 | Percentage | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 |
| | | | | Location | Stockpile 2 | Stockpile 2 | Difference | Stockpile 2 | Difference | Stockpile 2 | Stockpile 2 | Stockpile 2 | Stockpile 2 | Stockpile 2 | Stockpile 2 | Stockpile 2 | Stockpile 2 |
| Zinc, Zn | | 810 | 5 | Result | 2720 | 2410 | 12% | 2700 | 1% | 1140 | 3820 | 2880 | 2410 | 2950 | 2780 | 2980 | 3550 |
| Lead, Pb | mg/kg | 1500 | 5 | Result | 298 | 242 | 21% | 210 | 35% | 84 | 294 | 234 | 174 | 214 | 229 | 272 | 297 |

| Analyte | Units | Adopted RAC | Reporting Limit | Sample ID | SP2-30 | SP2-31 | SP2-32 | SP2-33 | SP2-34 | SP2-35 | SP2-36 | SP2-37 | SP2-38 | SP2-39 | VQC12 | Relative |
|----------|-------|-------------|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|
| | | | | Sample Date | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 |
| | | | | Location | Stockpile 2 | Stockpile 2 | Stockpile 2 | Stockpile 3 | Stockpile 4 | Stockpile 5 | Stockpile 6 | Stockpile 7 | Stockpile 8 | Stockpile 9 | Stockpile 2 | Difference |
| Zinc, Zn | | 810 | 5 | Result | 5060 | 12200 | 7740 | 3020 | 3470 | 3080 | 3170 | 8740 | 19700 | 13900 | 14800 | 6% |
| Lead, Pb | mg/kg | 1500 | 5 | Result | 442 | 1670 | 592 | 244 | 250 | 268 | 417 | 994 | 2080 | 1460 | 1420 | 3% |

| Analyte | Units | Adopted RAC | Reporting Limit | Sample ID | VQC12A | Relative | SP2-40 | SP2-41 | SP2-42 | SP2-43 | SP2-44 | SP2-45 | SP2-46 | SP2-47 | SP2-48 |
|----------|-------|-------------|-----------------|-------------|-------------|------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | | | | Sample Date | 22/12/2021 | Percentage | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 | 22/12/2021 |
| | | | | Location | Stockpile 2 | Difference | Stockpile 10 | Stockpile 11 | Stockpile 12 | Stockpile 13 | Stockpile 14 | Stockpile 15 | Stockpile 16 | Stockpile 17 | Stockpile 18 |
| Zinc, Zn | | 810 | 5 | Result | 11000 | 23% | 33000 | 2950 | 2720 | 15900 | 4490 | 3740 | 574 | 282 | 3690 |
| Lead, Pb | mg/kg | 1500 | 5 | Result | 1000 | 37% | 4340 | 210 | 205 | 2210 | 318 | 224 | 32 | 26 | 442 |

Appendix C: Qualtest Design Report

Resource Recovery Facility
and Truck Parking Depot -
Pavement Design
Draft Report

Lot 21F School Drive,
Tomago (Lot 8 DP 270328)

NEW21P-0179-AB
23 November 2021



23 November 2021

Remondis
C/- Avid Project Management Pty Ltd
PO Box 206
CARRINGTON NSW 2294

Attention: Mr David Read

Dear David

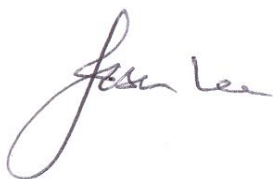
**RE: REMONDIS RESOURCE RECOVERY FACILITY AND TRUCK PARKING DEPOT
LOT 21F, SCHOOL DRIVE, TOMAGO (LOT 8 DP 270328)
PAVEMENT INVESTIGATION AND DESIGN – DRAFT REPORT**

Please find enclosed our Draft Report on Pavement Design for the proposed Remondis Resource Recovery Facility and Truck Parking Depot to be located at Lot 21F School Drive, Tomago, (Lot 8 DP 270328).

The report includes recommendations on pavement design and construction for the proposed truck parking area, which will also act as a capping layer as part of the RAP.

If you have any questions regarding this report, please do not hesitate to contact Ben Bunting, or the undersigned.

For and on behalf of Qualtest Laboratory (NSW) Pty Ltd



Jason Lee
Principal Geotechnical Engineer
BE(Hon) PEng MIEAust

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| Figure AB1: | Site Plan and Approximate Test Locations |
| Appendix A: | Results of Field Investigations |
| Appendix B: | Results of Laboratory Testing |
| Appendix C: | Proposed Pavement Materials - QA/QC Laboratory Test Results and Product Data Sheets |

1.0 Introduction

Qualtest Laboratory NSW Pty Ltd (Qualtest) is pleased to present this Draft Report on Pavement Design to AVID Project Management Pty Ltd (AVID), on behalf of Remondis Australia Pty Ltd (Remondis), for the proposed Remondis Resource Recovery Facility and Truck Parking Depot to be located at Lot 21F School Drive, Tomago, (Lot 8 DP 270328)

Based on the brief and drawings provided in an email from AVID dated 13 October 2021, it is understood that:

- As part of the works, there is a requirement to carry out remediation on Lot 8 DP270328 (21F School Drive). A truck parking area will also be constructed on this lot, and the pavement for the truck parking area will act as a capping layer as part of the RAP.
- The client (REMONDIS) requires geotechnical services for a pavement design (unsealed hardstand pavement), that will ensure the pavement is suitable for the intended truck parking use. Scope includes liaison with the environmental engineer (JM Environments) and Site Auditor (GHD) to ensure the pavement design is suitable to act as a capping layer, in order to satisfy the requirements of DA Condition B13.

The scope of work for the geotechnical investigation included providing discussion and recommendations on the following:

- Site preparation;
- Excavation conditions;
- The suitability of the site soils for use as fill, and on fill construction procedures;
- Pavement design and construction to Port Stephens Council specifications;
 - Note: Pavement design options are also be provided for a 'fit for purpose' pavement meeting the anticipated design life requirements, and/or compliance with any requirements of the RAP.
- Special requirements for construction procedures and site drainage.

This report presents the results of the field work investigations and laboratory testing, and provides recommendations for the scope outlined above.

2.0 Field Work

Field work investigations were carried out on 8 November 2021 and comprised of:

- Safety documentation including a Site Risk Assessment and Safe Work Method Statements specific to the project and site conditions for proposed investigation works;
- Site walkover to make observations of surface features at the property and in the immediate surrounding area;
- Drilling of 3 boreholes (BH1 to BH3) using hand tools and hand auger, to depths of between 1.70m and 2.00m, with bulk disturbed samples taken for subsequent laboratory testing. Boreholes were backfilled with the excavation spoil and compacted using hand tools.
- Dynamic Penetrometer (DP) testing was carried out at 12 locations to aid in the assessment of in-situ density/consistency of site subgrade soils and inferred CBR values;
 - DP1 to DP3 were carried out adjacent to borehole locations;
 - DP4 to DP12 were carried out at additional locations across the site;

Investigations were carried out by an experienced Geotechnical Engineer from Qualtest who located the boreholes and DP tests, carried out the sampling and testing, produced field logs of the boreholes, and made observations of the site surface conditions.

Engineering logs of the boreholes and DP test results are presented in Appendix A.

Approximate borehole and DP locations are shown on the attached Figure AB1. Boreholes were located relative to site features including trees, lot boundaries, and existing structures.

3.0 Site Description

3.1 Surface Conditions

The site comprises an approximately rectangular area located within Lot 21F School Drive Tomago, with an approximate plan area of 3,210m² based on the survey plans provided, (prepared by de Witt Consulting). The site is relatively flat with an overall gentle fall towards the northeast, with some minor surface undulation and a fill mound in the northern areas of the site.

At the time of site investigations, the site was a vacant industrial lot with site features including an approximately 8m square concrete slab, a fill mound (estimated approximately 95m³ in volume), and several piles of concrete beam waste.

The site was generally vegetated by established grass with scattered bushes and several small trees.

Photographs of the site taken on the day of the site investigations are shown below.



Photograph 1: From near centre of eastern site boundary, facing north.



Photograph 2: From near centre of eastern site boundary, facing northeast.



Photograph 3: From near northern corner of site, facing south.



Photograph 4: From near northern corner of site, facing southwest.

3.2 Subsurface Conditions

Reference to the 1:100,000 Newcastle Coalfield Regional Geology Series Sheet 9231 indicates most of the site to be underlain by Quaternary aged Dune and Beach sand deposits.

Table 1 presents a summary of the typical soil types encountered at borehole locations during the field investigation, divided into representative geotechnical units.

Table 2 contains a summary of the distribution of the above geotechnical units at the borehole locations.

Groundwater inflows were encountered at boreholes BH1, BH2 and BH3 at depths of 1.80m, 1.60m and 1.60m, respectively.

It should be noted that groundwater conditions can vary due to rainfall and other influences including regional groundwater flow, temperature, permeability, recharge areas, surface condition, and subsoil drainage.

TABLE 1 – SUMMARY OF GEOTECHNICAL UNITS AND SOIL TYPES

| Unit | Soil Type | Description |
|------|------------------------------|---|
| 1A | FILL – Root Affected | SAND – medium to coarse grained (mostly coarse grained), grey-brown and red-brown, trace fines of low plasticity, rootlets. Gravelly Clayey SAND - fine to coarse grained, dark grey-brown, fine to coarse grained angular to sub-rounded gravel, fines of low plasticity, root affected. |
| 1B | FILL – Previous Hardstand | Gravelly Silty SAND – fine to medium grained, pale brown, fines of low plasticity, fine grained angular gravel, weakly cemented. Clayey GRAVEL - fine to coarse grained, angular to sub-rounded, brown to red-brown, fines of low to medium plasticity, with some fine to coarse grained sand, with some rootlets. Silty Sandy GRAVEL - fine to coarse grained, angular, pale orange-brown to dark brown, dark grey and pale brown, fine to coarse grained sand, fines of low plasticity. |
| 2 | ALLUVIUM | SAND – fine to medium grained, brown, dark brown to dark grey-brown, pale brown to pale grey-brown, trace fines of low plasticity. |

TABLE 2 – SUMMARY OF GEOTECHNICAL UNITS ENCOUNTERED AT BOREHOLE LOCATIONS

| Location | Unit 1A Fill – Root affected | Unit 1B Fill – Previous Hardstand | Unit 2 Alluvium |
|---|---------------------------------|--------------------------------------|--------------------|
| | Depth in metres (m) | | |
| BH1 | 0.00 – 0.10 | 0.10 – 0.35 | 0.35 – 2.00 |
| BH2 | 0.00 – 0.05 | 0.05 – 0.20 | 0.20 – 1.80# |
| BH3 | 0.00 – 0.10 | 0.10 – 0.45 | 0.45 – 1.70# |
| Notes: # Denotes borehole collapse below depth of water table. | | | |

4.0 Laboratory Testing

Samples collected during the current field investigations were returned to our NATA accredited Newcastle Laboratory for testing. Testing comprised of:

- (2 no.) California Bearing Ratio (CBR, 4 day soaked) & Standard Compaction.

Results of the laboratory testing are presented in Appendix B, with a summary of the CBR test results presented in Table 3.

TABLE 3 – SUMMARY OF CBR TESTING RESULTS

| Location | Sample Depth (m) | Field Moisture Content (%) | Optimum Moisture Content (%) | Relationship of Field MC to OMC (%) | CBR (%) |
|----------|------------------|----------------------------|------------------------------|-------------------------------------|---------|
| BH2 | 0.3 – 0.6 | 3.6 | 18.5 | 14.9% DRY | 15 |
| BH3 | 0.1 – 0.3 | 8.4 | 9.1 | 0.7% DRY | 70 |

5.0 Discussion and Recommendations

5.1 Pavement Design

5.1.1 Design Subgrade CBR Value

Based on the results of the field work and laboratory testing, and previous experience in the surrounding area, the following design California Bearing Ratio (CBR) value has been adopted for pavement thickness design.

- Design Subgrade CBR = 10%

Fill placed at pavement subgrade level should be assessed by the geotechnical authority. If the fill is assessed to have CBR different to that of the design CBR, then a revised pavement design will be required for that section.

Prior to pavement construction, the exposed subgrade should be assessed by the geotechnical authority to confirm the design subgrade CBR and subsequent pavement thickness design requirement for that section.

Subgrade should be prepared in accordance with the site preparation requirements presented in Section 5.3.

5.1.2 Design Traffic Loadings

The proposed development is understood to be a private facility. As part of the works, there is a requirement to carry out remediation on Lot 8 DP270328 (21F School Drive). A truck parking area will also be constructed on this lot, and the pavement for the truck parking area will act as a capping layer as part of the RAP.

To provide general conformance to Port Stephens Council (PSC) design requirements, design of the truck parking / hardstand area has been based on a 'Commercial and Industrial' road classification, with a 30 year design life.

Based on client advice with regards to anticipated site usage and pavement life requirement, an alternative 'fit for purpose' design is also provided, which is based on a 15 year design life and meeting compliance with requirements of the RAP.

TABLE 4 – DESIGN TRAFFIC LOADING

| Pavement Classification | Indicative Application | Design Traffic (ESA's) |
|--------------------------------|--|-------------------------------|
| Commercial & Industrial | 30 year design life – (PSC Specification) | 1 x 10 ⁷ |
| Commercial & Industrial | 15 year design life – (Site Specific Alternative). | 5 x 10 ⁶ |

In the event that different design traffic design loadings are applicable, then the pavement thickness designs presented in this report should be reviewed.

5.1.3 Pavement Thickness Design

Pavement thickness design has been based on the procedures outlined in:

- Port Stephens Council – Infrastructure Specification, D2, Pavement Design;
- Austroads, "Guide to Pavement Technology, Part 2: Pavement Structural Design"; and,
- Australian Road Research Board, Special Report No. 41 (ARRB-SR41).

Pavement Thickness Designs are presented in Table 5.

Pavement Material Specification and Compaction Requirements are presented in Table 6.

Select fill or bridging layer should be allowed for beneath the pavement in any areas where poor, wet or saturated subgrade conditions are encountered.

The pavement subgrade should be prepared in accordance with the site preparation requirements presented in Section 5.3 and compacted to the compaction requirements presented in Table 6.

It is recommended that each construction length be boxed out to the minimum subgrade level required by the relevant pavement thickness design. Prior to pavement construction, the exposed subgrade should be assessed by the geotechnical authority to confirm the pavement thickness requirement for that section.

TABLE 5 – FLEXIBLE PAVEMENT THICKNESS DESIGN SUMMARY

| Road Classification | Commercial and Industrial | |
|---|-----------------------------|-------------------------|
| Design Life | 15 years | 30 years |
| Design Traffic Loading (ESA's) | 5 x 10 ⁶ | 1 x 10 ⁷ |
| Design Subgrade CBR (%) | 10 | 10 |
| Wearing Course (mm) | Unsealed Hardstand Pavement | |
| Base Course (mm) Stabilised with 4% Stabilment | 300 | 320 |
| Subbase (mm) | - | - |
| Select Fill (mm) | - | - |
| Geofabric Marker Layer | Bidim A34 or equivalent | Bidim A34 or equivalent |
| Total Thickness (mm) | 300 | 320 |
| <p><u>Notes:</u></p> <ol style="list-style-type: none"> 1) Where pavement material is placed directly on non-cohesive sand subgrade, a minimum layer thickness of 150mm is recommended for constructability purposes to ensure compaction of the layer to specification requirements is achieved. 2) An allowance for additional subgrade replacement should be anticipated in any areas where poor, wet or saturated subgrade conditions are encountered. 3) The requirement for, and depth and extent of any subgrade replacement / select filling, should be confirmed by the geotechnical authority at the time of construction. 4) Prior to pavement construction, the exposed subgrade should be assessed by the geotechnical authority to confirm the pavement thickness requirement for that section. | | |

It is understood that the proposed pavement is to comprise one of the following materials, as outlined in an email from AVID dated 17 November 2021.

- Option 1 – Gravel Cap 300mm, 4% stabilised DGB;
- Option 2 – Gravel Cap 300mm 4% stabilised ARRB 20mm FCR.

From a geotechnical perspective, either option proposed will be suitable for use in the hardstand pavement.

Further comments with regards to suitability and compliance to permeability specification requirements of the RAP to act as a capping layer is provided in Section 5.1.5.

TABLE 6 – PAVEMENT MATERIAL SPECIFICATION AND COMPACTION REQUIREMENTS

| Pavement Course | Material Specification | Compaction Requirements |
|--|--|---|
| Wearing Course | None - Unsealed Hardstand Pavement | |
| Base Course | CBR ≥ 80%, 2 ≤ PI ≤ 6% Bound with 4% Stabilment | 98% Modified (AS1289 5.2.1) |
| Subbase | CBR ≥ 30%, PI ≤ 12% | 98% Modified (AS1289 5.2.1) |
| Select Fill | Select, CBR ≥ 15%, PI ≤ 15%, max particle size 50mm Or * 2% cement stabilised subbase material | 95% Modified (AS1289 5.2.1) |
| Subgrade (top 300mm) | Minimum CBR = 10% | 100% Standard (AS1289 5.1.1), or Density Index of 80% (AS1289 5.6.1) |
| Subgrade / Fill Below | Minimum CBR = 10% | 95% Standard (AS1289 5.1.1), or Density Index of 70% (AS1289 5.6.1) |
| <p>Notes:</p> <p>1) All flexible road pavement materials shall be supplied to comply with requirements of Port Stephens Council, Specification 242, Flexible Pavements, for unbound base and unbound sub base.</p> <p>2) CBR = California Bearing Ratio, PI = Plasticity Index.</p> <p>3) Select Fill adopted will be dependent on subgrade moisture conditions. (Anticipated will generally comprise of site won material from excavations on site).</p> | | |

5.1.4 Construction Considerations

Considering the site typically has a sand / granular subgrade with high CBR and good drainage, it is anticipated that the 300mm pavement will be fit for purpose.

The addition of a two coat seal or similar will provide greater erosion resistance and may minimise the potential for ongoing maintenance.

It is understood that the final option adopted would be made in consultation between the designer and site owner, dependent on performance expectations, and may be subject to other project delivery considerations. Further advice on material types and suitability can be provided once a final option is decided on.

It is noted that with respect to alternate pavement design options provided, the onus is on the owner, potential owner, or interested party to decide whether the assessed level of risk is acceptable taking into account the likely consequences of the risk, (i.e. in terms of pavement performance expectations, pavement life, and ongoing maintenance).

5.1.5 Pavement Compliance to Requirements of the RAP

A Remedial Action Plan (RAP) for the site has been prepared by JM Environments (JME Report Ref: JME20005-3, dated 17 July 2021). In addition to the geotechnical pavement thickness design requirements in this Qualtest report, the RAP includes specification that the pavement where acting as the capping layer, must have 'a maximum permeability of 1×10^{-7} m/s'.

Laboratory testing results and product data sheets for proposed pavement materials have been provided by Gleeson Civil (based on two alternative materials for cap, with both materials sourced from Boral's Seaham quarry). Copies are included in Appendix C.

Based on the information provided and our experience with similar type construction materials, Qualtest make the following comments and assessment on material suitability with regards to the RAP permeability specification:

Option 1 - 4% Stabilised DGB20

Coffey Testing: Material Test Report No. NEW21C21S-07897 & NEW21C21S-07897-2.

Material Specification: DGB - RMS 3051.1 (ED 7) - Class 1 - Cat A.

- Test results provided have permeability of 1×10^{-8} m/s and 2×10^{-8} m/s.
- When placed and compacted with the addition of 4% Stabilment, it is anticipated that this will result in an even lower permeability.
- Therefore based on the laboratory test results provided, the material is assessed to meet specification requirement of 'a maximum permeability of 1×10^{-7} m/s'.

Option 2 - 4% stabilised ARRB 20FCR

Coffey Testing: Material Test Report No. NEWC21S-01417-1.

Material Specification: ARRB 1995 (SR41) – 20mmBase Table 3.1a.

Whilst there are no permeability test results available, the following points are noted:

- Depending on source, the ARRB product where typically comprising of a ridge gravel or conglomerate will generally have a low permeability, similar to that of the DGB20 above, in the order of 1×10^{-8} m/s or less.
- The ARRB material has a wider envelope for material property specifications than RMS 3051, with key specification limits that could impact on permeability summarised below:

| Material Type | Plasticity Index (%) | Grading - % Passing 0.075 Sieve |
|----------------|----------------------|---------------------------------|
| ARRB 20FCR | <6 | 3 - 11 |
| DGB20 RMS 3051 | 2 - 6 | 7 - 14 |

- For an ARRB 20FCR product, if material properties are at the lower end of the specification envelope (e.g. PI = 0%, and % Passing 0.075 = 3%), previous experience indicates such materials can have permeability in the order of 1×10^{-6} m/s, and if this was the case, would not meet RAP requirements of 'a maximum permeability of 1×10^{-7} m/s'.
- If adopting an ARRB 20FCR product, it would be preferable to have a product that is in the upper range of the PI & Grading specification envelopes listed above, or as a minimum at least to that of the DGB20 RMS3051, (e.g. PI = 2 - 6% & % passing 0.075 = 7 - 14% to ensure adequate fines within the material to meet permeability specification).

- Test results provided returned values of PI = 4% and % Passing 0.075 Sieve = 11%.
- On this basis, it is anticipated that when placed and compacted with the addition of 4% Stabilment, the material tested would likely have a permeability of 1×10^{-8} m/s or less.
- As no permeability test results are available from quarry source for the product, if this product is to be adopted, Qualtest would recommend conducting permeability testing on the material prior to construction to confirm compliance to RAP permeability specification.

5.2 Excavation Conditions

In terms of excavation conditions, it is expected that all site soils could be excavated by conventional excavator or backhoe bucket at least to the depths indicated on the appended borehole logs.

Groundwater levels were encountered in the boreholes at depths ranging from 1.6m to 1.8m below existing ground levels. Excavations below the water table within the sandy granular soils would be expected to collapse below the water table.

Excavations should be battered at 1V:2H or flatter and protected from erosion.

Temporary excavations should be battered at 1V:1.5H or flatter in granular soils, and protected from erosion. Steeper excavations may be supported by means of temporary shoring.

The safe working procedures of Work Cover NSW Excavation work code of practice, dated January 2020 should be followed.

5.3 Site Preparation

Site preparation suitable for structures, pavement support and site re-grading should consist of:

- Following bulk excavation to proposed subgrade level, areas for proposed pavement construction or site re-grading should be stripped as follows:
 - Long grasses to be slashed to remove majority of vegetation;
 - Larger trees and shrubs to be removed, including grubbing and removal of roots;
 - Localised removal of any other potentially deleterious materials or oversize material (if encountered) under the direction of the geotechnical authority.
- Following stripping, the exposed subgrade should be proof rolled (minimum 10 tonne static roller), to identify any wet or excessively deflecting material. Any such areas should be over excavated and backfilled with site won sand or approved select material;
- Compact subgrade in accordance with the recommendations of this report;
- The moisture content of the subgrade materials and therefore the need for moisture conditioning or over-excavation and replacement, will be largely dependent on pre-existing and prevailing weather conditions at the time of construction;
 - Due to the predominantly sand and granular subgrade materials encountered, moisture conditioning and/or need for over-excavation is considered unlikely.
- Subgrade preparation should be carried out using a tracked excavator equipped with a smooth sided ('gummy') bucket to minimise the risk of over-disturbance of soils;
- Protect the area after subgrade preparation to maintain moisture content as far as practicable. The placement of pavement gravel would normally provide adequate protection;

- Site preparation should include provision of drainage and erosion control as required, as well as sedimentation control measures.

If over-wet subgrades exist at the time of construction or deleterious materials are encountered at subgrade level, these materials should be over-excavated and be replaced with a minimum depth of 250mm of well graded granular select material with CBR of 10% or greater.

The requirement for, and extent of subgrade replacement / select filling, should be confirmed by the geotechnical authority at the time of construction.

5.4 Fill Construction Procedures

Earthworks for pavement construction or support of foundations should consist of the following measures:

- Approved fill beneath structures and pavements should be compacted in layers not exceeding 300mm loose thickness;
- The top 300mm of natural subgrade below pavements or the final 300mm of road subgrade fill should be compacted to a minimum density index of 80% (AS1289 5.6.1) for granular soils, or a minimum density ratio of 100% Standard (AS1289 5.1.1) for cohesive soils;
- At design subgrade level for pavements or structures, the surface should be compacted for a depth of at least 1.0m to a minimum density index of 70% (AS1289 5.6.1). Compaction should be confirmed by penetrometer testing prior to placement of pavement materials or pouring of concrete for footings;
- If cohesive site fill (clay soils) are placed beneath structures, they should be compacted to a minimum density ratio of 98% Standard Compaction within $\pm 2\%$ of OMC;
- Where back filling of excavations is proposed (e.g. service trenches), approved clean fill should be compacted to a minimum density index of 70% (AS1289 5.6.1) for granular soils, or a minimum density ratio of 95% Standard (AS1289 5.1.1) for cohesive soils, in maximum lifts of 300mm depth;
- All fill should be supported by properly designed and constructed retaining walls or else battered at 1V:2H or flatter and protected against erosion;
- Earthworks should be carried out in accordance with the recommendations outlined in AS3798-2007 '*Guidelines for Earthworks for Commercial and Residential Developments*'.

5.5 Suitability of Site Materials for Re-Use as Fill

The following comments are made with respect to suitability of site materials for re-use as fill based upon geotechnical engineering considerations:

- Unit 1A FILL - Materials may be variable (if including vegetation or deleterious material), and suitability for re-use should be confirmed at the time of construction;
- Unit 1B Fill – Former Hardstand materials are generally expected to be suitable for re-use as general fill for engineering purposes;
- Unit 2 Alluvium – Sand materials are generally expected to be suitable for re-use as general fill for engineering purposes.

The suitability of material for re-use should be assessed and confirmed by the geotechnical authority at the time of construction. The materials may require some moisture conditioning and/or sorting to remove any oversize material if encountered. Suitability for re-use will also need to be assessed by the environmental consultant in accordance with the RAP.

5.6 Special Construction Requirements and Site Drainage

Inspection should be carried out by a geotechnical authority during construction to confirm the conditions assumed in this report and in the design.

Pavement thickness designs should allow for the provision of adequate surface and subsurface drainage of the pavement and adjacent areas to prevent moisture ingress into the pavement materials and subgrade. Due to the depth of groundwater, the sand subgrade is expected to provide adequate drainage to the pavement layers; therefore, it is anticipated that subsoil drains may not be required.

Adequate surface and subsurface drainage should be installed and connected to the stormwater disposal system.

In addition to geotechnical specification provided in Section 5.0 of this report with regards to site preparation, site earthworks and placement and compaction of fill materials from a geotechnical perspective, all works (including provisions in relation to consolidation of contaminated material under the cap and any specific HSSE procedures) are to be carried out in accordance with the environmental requirements as outlined in the RAP.

6.0 Limitations

The findings presented in the report and used as the basis for recommendations presented herein were obtained using normal, industry accepted geotechnical design practices and standards. To our knowledge, they represent a reasonable interpretation of the general conditions of the site.

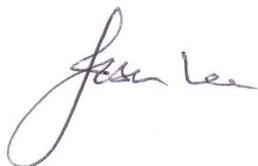
The extent of testing associated with this assessment is limited to discrete test locations. It should be noted that subsurface conditions between and away from the test locations may be different to those observed during the field work and used as the basis of the recommendations contained in this report.

If subsurface conditions encountered during construction differ from those given in this report, further advice should be sought without delay.

Data and opinions contained within the report may not be used in other contexts or for any other purposes without prior review and agreement by Qualtest. If this report is reproduced, it must be in full.

If you have any further questions regarding this report, please do not hesitate to contact Ben Bunting, or the undersigned.

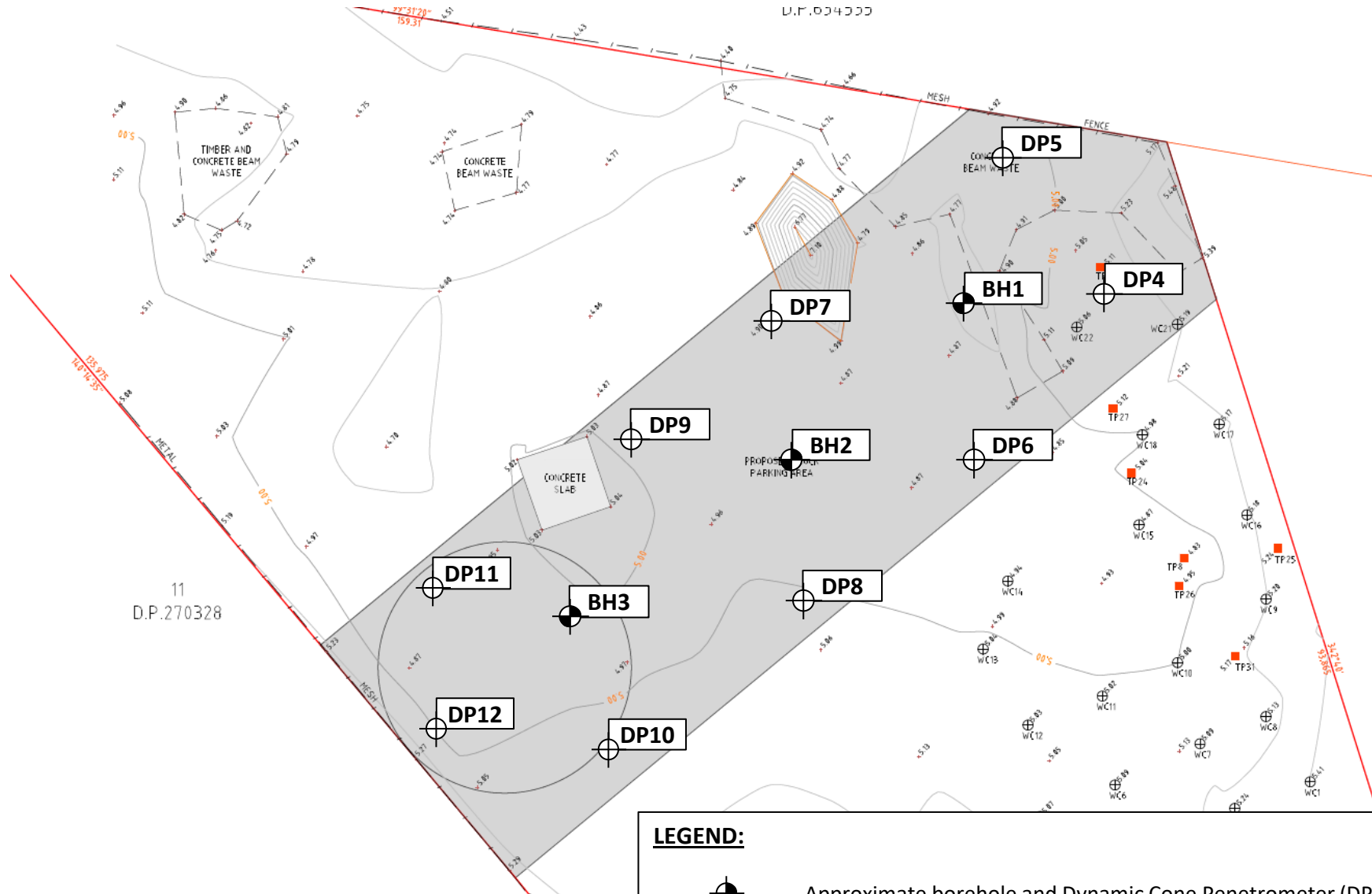
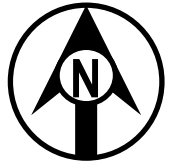
For and on behalf of Qualtest Laboratory (NSW) Pty Ltd.



Jason Lee
Principal Geotechnical Engineer
BE(Hon) PEng MIEAust

FIGURES:

Figure AB1 – Site Plan and Approximate Test Locations



LEGEND:

- Approximate borehole and Dynamic Cone Penetrometer (DP) test location
- Approximate Dynamic Penetrometer (DP) test location

Based on Survey Plan prepared by de Witt Consulting
 (Job Ref. 12692, Dwg Ref. 12692-DET-04.11.21, Sheet No. 1, Rev. A, dated 04/11/2021)

| | | | | |
|--|-----------|--|-------------|-------------|
| | Client: | REMONDIS AUSTRALIA PTY LTD C/- AVID PROJECT MANAGEMENT PTY LTD | Drawing No: | FIGURE AB1 |
| | Project: | RESOURCE RECOVERY FACILITY AND TRUCK PARKING AREA | Project No: | NEW21P-0179 |
| | Location: | LOT 21F SCHOOL DRIVE, TOMAGO | Scale: | N.T.S. |
| | Title: | SITE PLAN AND APPROXIMATE TEST LOCATIONS | Date: | 19/11/2021 |

APPENDIX A:

Results of Field Investigations



ENGINEERING LOG - HAND AUGER

HAND AUGER NO: **BH1**

CLIENT: REMONDIS AUS. C/- AVID P.M.

PAGE: 1 OF 1

PROJECT: RESOURCE RECOVERY FACILITY & TRUCK DEPOT

JOB NO: NEW21P-0179

LOCATION: LOT 21F SCHOOL DRIVE, TOMAGO

LOGGED BY: BB

DATE: 8/11/21

DRILL TYPE: HAND TOOLS / HAND AUGER
BOREHOLE DIAMETER: 300/100 mm

SURFACE RL:
DATUM:

| Drilling and Sampling | | | | Material description and profile information | | | | | Field Test | | Structure and additional observations |
|-----------------------|-------|---------|--------|--|-------------|-----------------------|--|--|---------------------|-----------|---------------------------------------|
| METHOD | WATER | SAMPLES | RL (m) | DEPTH (m) | GRAPHIC LOG | CLASSIFICATION SYMBOL | MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components | MOISTURE CONDITION | CONSISTENCY DENSITY | Test Type | |
| HAND TOOLS | | 0.10m | | | | SP | FILL: SAND - medium to coarse grained (mostly coarse grained), grey-brown and red-brown, trace fines of low plasticity. | | | | FILL |
| | | CBR | | | | SM | FILL: Gravelly Silty SAND - fine to coarse grained, pale brown, fines of low plasticity, fine grained angular gravel, weakly cemented. | | | | FILL - HARDSTAND |
| | | 0.35m | | | | | | SAND - fine to medium grained, brown, trace fines of low plasticity. | | | |
| HA | | 0.60m | | 0.5 | | | | | | | |
| | | | | 1.0 | | | | | | | |
| | | | | 1.5 | | | | | | | |
| | | | | 2.0 | | | | | | | |
| | | | | 2.00m | | | Hole Terminated at 2.00 m | | | | |

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| | | | | |
|---|---|--|---|---|
| LEGEND: Water Water Level (Date and time shown) Water Inflow Water Outflow Strata Changes Gradational or transitional strata Definitive or distinct strata change | Notes, Samples and Tests U ₃₀ 50mm Diameter tube sample CBR Bulk sample for CBR testing E Environmental sample (Glass jar, sealed and chilled on site) ASS Acid Sulfate Soil Sample (Plastic bag, air expelled, chilled) B Bulk Sample | Consistency VS Very Soft S Soft F Firm St Stiff VSt Very Stiff H Hard Fb Friable | UCS (kPa) <25 25 - 50 50 - 100 100 - 200 200 - 400 >400 | Moisture Condition D Dry M Moist W Wet W _p Plastic Limit W _L Liquid Limit |
| | Field Tests PID Photoionisation detector reading (ppm) DCP(x-y) Dynamic penetrometer test (test depth interval shown) HP Hand Penetrometer test (UCS kPa) | Density V Very Loose L Loose MD Medium Dense D Dense VD Very Dense | Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100% | |



ENGINEERING LOG - HAND AUGER

HAND AUGER NO: **BH2**

CLIENT: REMONDIS AUS. C/- AVID P.M.

PAGE: 1 OF 1

PROJECT: RESOURCE RECOVERY FACILITY & TRUCK DEPOT

JOB NO: NEW21P-0179

LOCATION: LOT 21F SCHOOL DRIVE, TOMAGO

LOGGED BY: BB

DATE: 8/11/21

DRILL TYPE: HAND TOOLS / HAND AUGER
BOREHOLE DIAMETER: 300/100 mm

SURFACE RL:
DATUM:

| Drilling and Sampling | | | | Material description and profile information | | | | | Field Test | | Structure and additional observations |
|-----------------------|----------|---------|--------|--|-------------|-----------------------|---|--------------------|---------------------|-----------|---------------------------------------|
| METHOD | WATER | SAMPLES | RL (m) | DEPTH (m) | GRAPHIC LOG | CLASSIFICATION SYMBOL | MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components | MOISTURE CONDITION | CONSISTENCY DENSITY | Test Type | |
| HAND TOOLS | | 0.30m | | | | SC | 0.05m FILL: Gravelly Clayey SAND - fine to coarse grained, dark grey-brown, fine to medium grained angular to sub-rounded gravel, fines of low plasticity, root affected. | M | VD | | |
| | | CBR | | | | GC | 0.20m FILL: Clayey GRAVEL - fine to coarse grained, angular to sub-rounded, brown to red-brown, fines of low to medium plasticity, with some fine to coarse grained sand, with some rootlets. | | | | |
| HIA | 08/11/21 | 0.60m | | 0.5 | | SP | SAND - fine to medium grained, dark brown and dark grey-brown, trace fines of low plasticity. | | | | |
| | | | | 1.0 | | | Pale grey-brown. | M - W | D - VD | | |
| | | | | 1.5 | | | | W | | | |
| | | | | 1.80m | | | Hole Terminated at 1.80 m Collapse | | | | |
| | | | | 2.0 | | | | | | | |

LEGEND:

Water

- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

Strata Changes

- Gradational or transitional strata
- Definitive or distinct strata change

Notes, Samples and Tests

- U₃₀ 50mm Diameter tube sample
- CBR Bulk sample for CBR testing
- E Environmental sample (Glass jar, sealed and chilled on site)
- ASS Acid Sulfate Soil Sample (Plastic bag, air expelled, chilled)
- B Bulk Sample

Field Tests

- PID Photoionisation detector reading (ppm)
- DCP(x-y) Dynamic penetrometer test (test depth interval shown)
- HP Hand Penetrometer test (UCS kPa)

| Consistency | UCS (kPa) | Moisture Condition |
|-----------------|-------------------------|------------------------------|
| VS Very Soft | <25 | D Dry |
| S Soft | 25 - 50 | M Moist |
| F Firm | 50 - 100 | W Wet |
| St Stiff | 100 - 200 | W _p Plastic Limit |
| VSt Very Stiff | 200 - 400 | W _L Liquid Limit |
| H Hard | >400 | |
| Fb Friable | | |
| Density | | |
| V Very Loose | Density Index <15% | |
| L Loose | Density Index 15 - 35% | |
| MD Medium Dense | Density Index 35 - 65% | |
| D Dense | Density Index 65 - 85% | |
| VD Very Dense | Density Index 85 - 100% | |

OT LIB 1.1.GLB Log NON-CORED BOREHOLE - TEST PIT NEW21P-0179 LOGS.GPJ <-DrawingFile>> 19/11/2021 09:59 10.02.00.04 D:\gel Lab and In Situ Tool



ENGINEERING LOG - HAND AUGER

HAND AUGER NO: **BH3**

CLIENT: REMONDIS AUS. C/- AVID P.M.

PAGE: 1 OF 1

PROJECT: RESOURCE RECOVERY FACILITY & TRUCK DEPOT

JOB NO: NEW21P-0179

LOCATION: LOT 21F SCHOOL DRIVE, TOMAGO

LOGGED BY: BB

DATE: 8/11/21

DRILL TYPE: HAND TOOLS / HAND AUGER

SURFACE RL:

BOREHOLE DIAMETER: 300/100 mm

DATUM:

| Drilling and Sampling | | | | Material description and profile information | | | | | Field Test | | Structure and additional observations | |
|-----------------------|-------|---------|--------|--|-------------------------|-----------------------|---|--------------------|---------------------|-----------|---------------------------------------|----------|
| METHOD | WATER | SAMPLES | RL (m) | DEPTH (m) | GRAPHIC LOG | CLASSIFICATION SYMBOL | MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components | MOISTURE CONDITION | CONSISTENCY DENSITY | Test Type | | Result |
| HAND TOOLS | | 0.10m | | | [Cross-hatched pattern] | SC | FILL: Gravelly Clayey SAND - fine to coarse grained (mostly fine to medium grained), dark grey-brown, fine to coarse grained (mostly fine to medium grained) angular to sub-rounded gravel, fines of low plasticity, root affected. | | | | | FILL |
| | | CBR | 0.30m | | | GM | FILL: Silty Sandy GRAVEL - fine to coarse grained (mostly medium grained), angular, pale orange-brown to dark brown, fine to coarse grained sand, fines of low plasticity. Dark grey. Pale brown. | | | | | |
| HA | | | | 0.5 | [Dotted pattern] | | SAND - fine to medium grained, brown to dark brown, trace fines of low plasticity. | M | VD | | | ALLUVIUM |
| | | | | 1.0 | | SP | Brown to pale brown. Pale brown to pale grey-brown. | | | | | |
| | | | | 1.5 | | | | M - W | | D - VD | | |
| | | | | 1.70m | | | Hole Terminated at 1.70 m Collapse | W | | | | |
| | | | | 2.0 | | | | | | | | |

LEGEND:

Water

- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

Strata Changes

- Gradational or transitional strata
- Definitive or distinct strata change

Notes, Samples and Tests

- U₃₀ 50mm Diameter tube sample
- CBR Bulk sample for CBR testing
- E Environmental sample (Glass jar, sealed and chilled on site)
- ASS Acid Sulfate Soil Sample (Plastic bag, air expelled, chilled)
- B Bulk Sample

Field Tests

- PID Photoionisation detector reading (ppm)
- DCP(x-y) Dynamic penetrometer test (test depth interval shown)
- HP Hand Penetrometer test (UCS kPa)

| Consistency | | UCS (kPa) | Moisture Condition |
|-------------|--------------|-----------|------------------------------|
| VS | Very Soft | <25 | D Dry |
| S | Soft | 25 - 50 | M Moist |
| F | Firm | 50 - 100 | W Wet |
| St | Stiff | 100 - 200 | W _p Plastic Limit |
| VSt | Very Stiff | 200 - 400 | W _L Liquid Limit |
| H | Hard | >400 | |
| Fb | Friable | | |
| Density | | | |
| V | Very Loose | | Density Index <15% |
| L | Loose | | Density Index 15 - 35% |
| MD | Medium Dense | | Density Index 35 - 65% |
| D | Dense | | Density Index 65 - 85% |
| VD | Very Dense | | Density Index 85 - 100% |

OT.LIB.1.1.GLB.Log_NON-CORED BOREHOLE - TEST.PIT_NEW21P-0179.LOGS.GPJ <-DrawingFile>> 19/11/2021 09:59 10.02.00.04 Daigel Lab and In Situ Tool

DYNAMIC PENETROMETER - TEST REPORT

Client: REMONDIS AUSTRALIA C/- AVID PROJECT MANAGEMENT
Principal:
Project: RESOURCE RECOVERY FACILITY & TRUCK DEPOT
Location: LOT 21F SCHOOL DRIVE, TOMAGO

Project Number: NEW21P-0179
Sheet No: 1 of 2
Test Date: 8/11/2021
Tested By: BB

| Test Method: AS1289 6.3.2 | | <input type="checkbox"/> Cone Tip | | | | | | | |
|---------------------------|-------------|---|-------|------|-----|------|------|--------------------|--|
| Drop Height: 510 ± 5mm | | <input checked="" type="checkbox"/> Blunt Tip | | | | | | | |
| Depth Below Surface (mm) | Test Number | | | | | | | | Test Location / Comments |
| | DP1 | DP2 | DP3 | DP4 | DP5 | DP6 | DP7 | DP8 | |
| 150 | - | - | - | 5 | 2 | 16 | 11 | * Surface bouncing | DCP locations as per attached Figure AB1. DP8 unable to penetrate ground surface; attempted 10 separate locations near to proposed test location, all encountered surface bouncing. |
| 300 | - | - | - | 20 | 4 | 37 | 10 | | |
| 450 | 4 | 9 | - | 15 | 6 | 45 | 13 | | |
| 600 | 13 | 20 | 4 | 18 | 9 | 42 | 18 | | |
| 750 | 30 | 24 | 8 | 25 | 10 | Ref. | 23 | | |
| 900 | 33 | 30 | # END | 29 | 12 | | 17 | | |
| 1050 | 35 | 37 | | 27 | 12 | | 20 | | |
| 1200 | Ref. | Ref. | | 27 | 12 | | 20 | | |
| 1350 | | | | Ref. | 10 | | 24 | | |
| 1500 | | | | | 7 | | Ref. | | |
| 1650 | | | | | 6 | | | | |
| 1800 | | | | | | | | | |
| 1950 | | | | | | | | | |
| 2100 | | | | | | | | | |
| 2250 | | | | | | | | | |
| 2400 | | | | | | | | | |
| 2550 | | | | | | | | | |
| 2700 | | | | | | | | | |
| 2850 | | | | | | | | | |
| 3000 | | | | | | | | | |
| 3150 | | | | | | | | | |
| 3300 | | | | | | | | | |
| 3450 | | | | | | | | | |
| 3600 | | | | | | | | | |
| 3750 | | | | | | | | | |
| 3900 | | | | | | | | | |
| 4050 | | | | | | | | | |
| 4200 | | | | | | | | | |
| 4350 | | | | | | | | | |
| 4500 | | | | | | | | | |

Comments: Readings recorded in blows per 150mm increments.
* denotes bouncing refusal of DCP hammer (indicative of Very Dense material or obstructions in fill)
Ref. indicates Refusal of DCP hammer; test terminated due to very high blow counts.
DP terminated early due to equipment damage; sufficient information from adjacent testing

DYNAMIC PENETROMETER - TEST REPORT

Client: REMONDIS AUSTRALIA C/- AVID PROJECT MANAGEMENT
Principal:
Project: RESOURCE RECOVERY FACILITY & TRUCK DEPOT
Location: LOT 21F SCHOOL DRIVE, TOMAGO

Project Number: NEW21P-0179
Sheet No: 2 of 2
Test Date: 8/11/2021
Tested By: BB

| Test Method: AS1289 6.3.2 | | <input type="checkbox"/> Cone Tip | | | | | | | |
|---------------------------|-------------|---|------|------|--|--|--|--|---|
| Drop Height: 510 ± 5mm | | <input checked="" type="checkbox"/> Blunt Tip | | | | | | | |
| Depth Below Surface (mm) | Test Number | | | | | | | | Test Location / Comments |
| | DP9 | DP10 | DP11 | DP12 | | | | | |
| 150 | 20 | 20 | 24 | 36 | | | | | DCP locations as per attached Figure AB1. |
| 300 | 19 | 32 | 26 | 52 | | | | | |
| 450 | 19 | 30 | 12 | Ref. | | | | | |
| 600 | 18 | 29 | 10 | | | | | | |
| 750 | 19 | 23 | 10 | | | | | | |
| 900 | 16 | 24 | 21 | | | | | | |
| 1050 | 22 | 25 | 21 | | | | | | |
| 1200 | 27 | Ref. | 20 | | | | | | |
| 1350 | 29 | | Ref. | | | | | | |
| 1500 | Ref. | | | | | | | | |
| 1650 | | | | | | | | | |
| 1800 | | | | | | | | | |
| 1950 | | | | | | | | | |
| 2100 | | | | | | | | | |
| 2250 | | | | | | | | | |
| 2400 | | | | | | | | | |
| 2550 | | | | | | | | | |
| 2700 | | | | | | | | | |
| 2850 | | | | | | | | | |
| 3000 | | | | | | | | | |
| 3150 | | | | | | | | | |
| 3300 | | | | | | | | | |
| 3450 | | | | | | | | | |
| 3600 | | | | | | | | | |
| 3750 | | | | | | | | | |
| 3900 | | | | | | | | | |
| 4050 | | | | | | | | | |
| 4200 | | | | | | | | | |
| 4350 | | | | | | | | | |
| 4500 | | | | | | | | | |

Comments: Readings recorded in blows per 150mm increments.
* denotes bouncing refusal of DCP hammer (indicative of Very Dense material or obstructions in fill)
Ref. indicates Refusal of DCP hammer; test terminated due to very high blow counts.
DP terminated early due to equipment damage; sufficient information from adjacent testing

APPENDIX B:

Results of Laboratory Testing


California Bearing Ratio Test Report

Client: Remondis Australia Pty Ltd
 34 Waterloo Avenue
 Thornton NSW 2322

Project No.: NEW21P-0179

Project Name: Remondis Resource Recovery Facility & Truck Parking Parking Depot

Project Location: Lot 21F, School Drive, Tomago



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.
 Results provided relate only to the items tested or sampled.

B. Cullen
 Approved Signatory: Brent Cullen
 (Senior Geotechnician)
 NATA Accredited Laboratory Number: 18686
 Date of Issue: 23/11/2021

Sample Details

Sample ID: NEW21W-4830-S01 **Date Sampled:** 8/11/2021

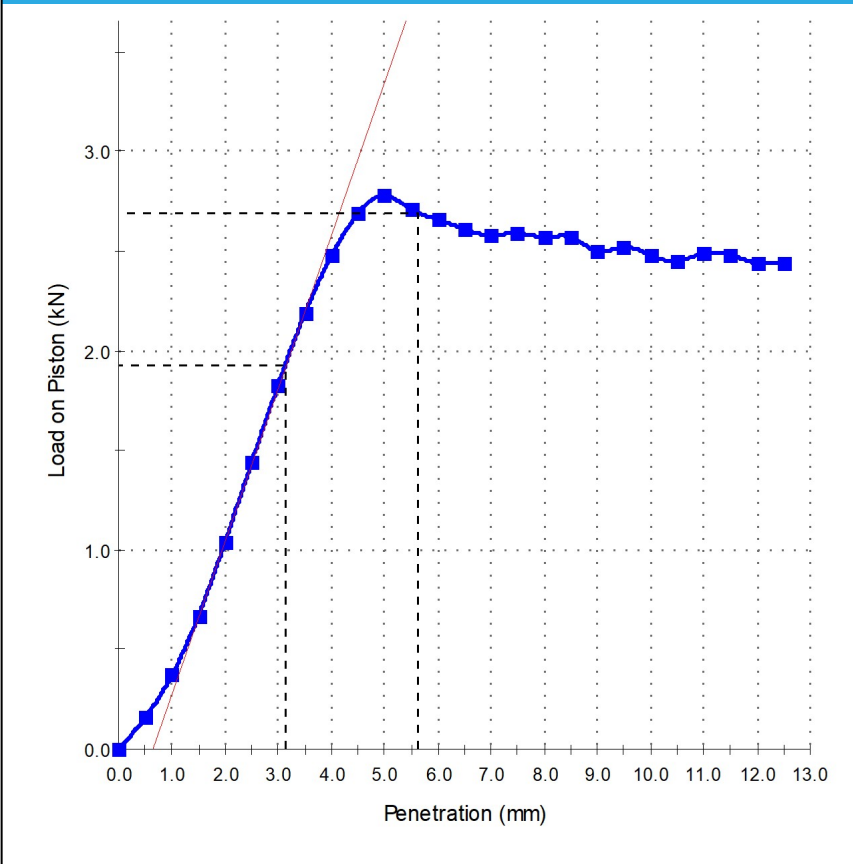
Sampling Method: The results outlined below apply to the sample as received

Specification: No Specification **Source:** On-Site Insitu

Location: BH2 - (0.3 - 0.6m) **Material:** Sand

Date Tested: 18/11/2021

Load vs Penetration



Test Results

AS 1289.6.1.1

CBR at 2.5mm (%): **15**

Maximum Dry Density(t/m³): 1.68
 Optimum Moisture Content(%): 18.5
 Dry Density before Soaking (t/m³): 1.67
 Density Ratio before Soaking (%): 99.5
 Moisture Content before Soaking (%): 18.3
 Moisture Ratio before Soaking (%): 99.0
 Dry Density after Soaking (t/m³): 1.65
 Density Ratio after Soaking (%): 98.5
 Swell (%): 1.0
 Moisture Content of Top 30mm (%): 15.3
 Moisture Content of Remaining Depth (%): 16.7
 Compaction Hammer Used: Standard AS 1289.5.1.1
 Surcharge Mass (kg): 9.00
 Period of Soaking (Days): 4
 Retained on 19 mm Sieve (%): 0
 CBR Moisture Content Method: AS 1289.2.1.1
 Sample Curing Time (h): 48
 Plasticity Determination Method: Visual/Tactile

AS1289.2.1.1

In Situ (Field) Moisture Content (%): 3.6

Comments

Report No: CBR:NEW21W-4830-S02

Issue No: 1

California Bearing Ratio Test Report

Client: Remondis Australia Pty Ltd
 34 Waterloo Avenue
 Thornton NSW 2322

Project No.: NEW21P-0179

Project Name: Remondis Resource Recovery Facility & Truck Parking Parking Depot

Project Location: Lot 21F, School Drive, Tomago



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.
 Results provided relate only to the items tested or sampled.

B. Cullen
 Approved Signatory: Brent Cullen
 (Senior Geotechnician)
 NATA Accredited Laboratory Number: 18686
 Date of Issue: 23/11/2021

Sample Details

Sample ID: NEW21W-4830-S02 **Date Sampled:** 8/11/2021

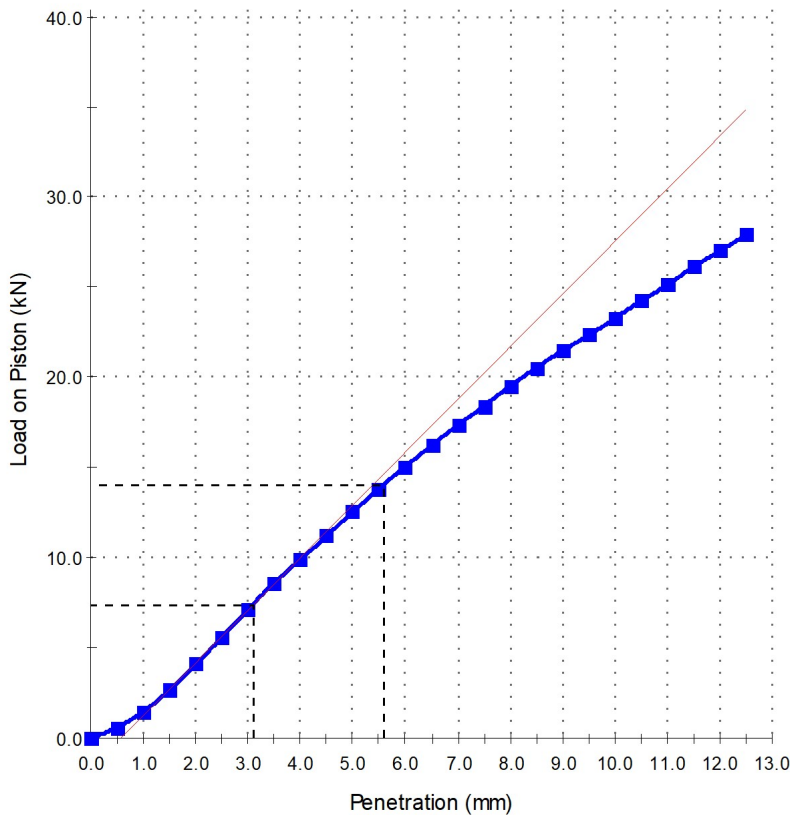
Sampling Method: The results outlined below apply to the sample as received

Specification: No Specification **Source:** On-Site Insitu

Location: BH3 - (0.1 - 0.3m) **Material:** Silty Sandy Gravel

Date Tested: 18/11/2021

Load vs Penetration



Test Results

AS 1289.6.1.1

CBR at 5.0mm (%): **70**

Maximum Dry Density(t/m³): 2.09
 Optimum Moisture Content(%): 9.1
 Dry Density before Soaking (t/m³): 2.09
 Density Ratio before Soaking (%): 100.0
 Moisture Content before Soaking (%): 8.9
 Moisture Ratio before Soaking (%): 97.0
 Dry Density after Soaking (t/m³): 2.09
 Density Ratio after Soaking (%): 100.0
 Swell (%): 0.0
 Moisture Content of Top 30mm (%): 10.3
 Moisture Content of Remaining Depth (%): 8.8
 Compaction Hammer Used: Standard AS 1289.5.1.1
 Surcharge Mass (kg): 9.00
 Period of Soaking (Days): 4
 Retained on 19 mm Sieve (%): 6
 CBR Moisture Content Method: AS 1289.2.1.1
 Sample Curing Time (h): 72
 Plasticity Determination Method: Visual/Tactile

AS1289.2.1.1
 In Situ (Field) Moisture Content (%): 8.4

Comments

APPENDIX C:

**Proposed Pavement Materials - QA/QC
Laboratory Test Results and Product Data
Sheets**

Material Test Report

Report No: **NEWC21S-07897-2**

Issue No: **1**

| | |
|----------------------|--|
| Client: | Boral Quarries PO Box 607 Raymond Terrace NSW 2324 |
| Principal: | |
| Project No.: | TESTNEWC00046AA |
| Project Name: | Concrete, Soil and Aggregate Testing (Newcastle) |
| Lot No.: | - |
| | TRN: WSE-21/00033-Q06-Q10 |



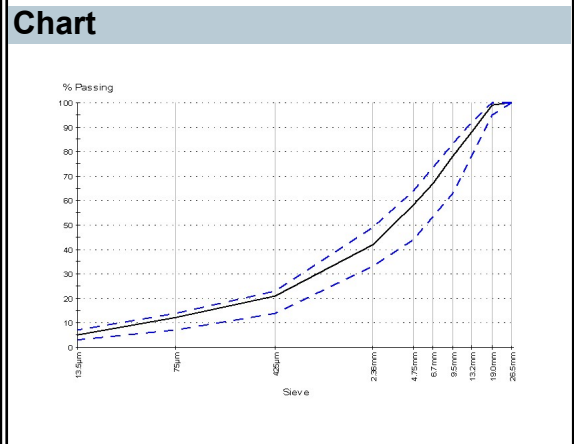
Accredited for compliance with ISO/IEC 17025 - Testing. NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection and proficiency testing scheme providers reports.

Chris Blackford
 Approved Signatory: Chris Blackford
 (Construction Materials Manager)
 NATA Accredited Laboratory Number: 431
 Date of Issue: 28/10/2021

| Sample Details | |
|-------------------------------|--|
| Sample ID / Client ID: | NEWC21S-07897 / 033-Q06 |
| Date Sampled: | 24/09/2021 |
| Source: | Boral Seaham Quarry |
| Material: | 20mm DGB + Ash |
| Specification: | DGB - RMS 3051.1 (ED7) - Class 1 - Cat:A |
| Sampling Method: | Submitted by client* |
| Project Location: | Seaham, NSW |
| Sample Location: | Quarry Stockpile 12916 Lot A 800t Blend Plant |

| Particle Size Distribution | | |
|----------------------------|--------------------|---------------|
| Method: | RMS T106, RMS T107 | |
| Drying by: | Oven | |
| Date Tested: | 5/10/2021 | |
| Sieve Size | % Passing | Limits |
| 26.5mm | 100 | 100 |
| 19.0mm | 99 | 95 to 100 |
| 13.2mm | 88 | 78 to 92 |
| 9.5mm | 78 | 63 to 83 |
| 6.7mm | 67 | |
| 4.75mm | 58 | 44 to 64 |
| 2.36mm | 42 | 33 to 49 |
| 425µm | 21 | 14 to 23 |
| 75µm | 12 | 7 to 14 |
| 13.5µm | 5 | 3 to 7 |
| Sieve Range | % Retained | |
| 19.0mm to 13.2mm | 11 | 7 to 17 |
| 13.2mm to 9.5mm | 10 | 8 to 16 |
| 9.5mm to 4.75mm | 20 | 14 to 24 |
| 4.75mm to 2.36mm | 17 | 8 to 18 |
| 2.36mm to 425µm | 20 | 14 to 28 |
| 425µm to 75µm | 9 | 6 to 13 |
| 75µm to 13.5µm | 6 | 3 to 7 |

| Other Test Results | | | |
|-------------------------------------|--------------------|--|----------|
| Description | Method | Result | Limits |
| Mass Retained on 53mm (%) | RMS T102 | 0 | |
| Method of Pretreatment | | CAX3 | |
| Date Tested | | 28/09/2021 | |
| Ratio A | RMS T107 | 51 | |
| Ratio B | | 56 | |
| Ratio C | | 46 | |
| Observations | | MF < then 16 pours. | |
| Passing 2.36mm sieve (%) | RMS T106, RMS T107 | 42 | 33 to 49 |
| Passing 425µm sieve (%) | | 21 | 14 to 23 |
| Passing 75µm sieve (%) | | 12 | 7 to 14 |
| Passing 13.5µm sieve (%) | | 5 | 3 to 7 |
| Retained Between 2.36mm - 425µm (%) | | 20 | 14 to 28 |
| Retained Between 425µm - 75µm (%) | | 9 | 6 to 13 |
| Retained Between 75µm - 13.5µm (%) | | 6 | 3 to 7 |
| Sample History | AS 1289.1.1 | Air-dried | |
| Preparation | AS 1289.1.1 | Dry Sieved | |
| Liquid Limit (%) | RMS T108 | 20 | ≤20 |
| Method | | Four Point | |
| Plastic Limit (%) | RMS T109 | 18 | ≤20 |
| Plasticity Index (%) | RMS T109 | 2 | 2 to 6 |
| Date Tested | | 6/10/2021 | |
| Binder | RMS T116 | Fly Ash | |
| Binder Source | | Boral Cement Kooragang | |
| Compaction Method | | Standard | |
| Specimen Curing Period | | 7 | |
| Condition of Curing | | Accelerated | |
| Average UCS (MPa) | | | ≤1.0 |
| Mass Retained on 19.0mm (%) | | 1 | |
| Remarks | | UCS cylinders dissolved during 4 hour soaking stage. | |
| Date Tested | | 29/09/2021 | |



Comments
 *Results relate only to the items tested or sampled.

Material Test Report

Report No: NEWC21S-07897-2
Issue No: 1

Client: Boral Quarries
 PO Box 607
 Raymond Terrace NSW 2324

Principal:

Project No.: TESTNEWC00046AA

Project Name: Concrete, Soil and Aggregate Testing (Newcastle)

Lot No.: - **TRN:** WSE-21/00033-Q06-Q10



Accredited for compliance with ISO/IEC 17025 - Testing. NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection and proficiency testing scheme providers reports.

Chris Blackford

Approved Signatory: Chris Blackford
 (Construction Materials Manager)
 NATA Accredited Laboratory Number:431
 Date of Issue: 28/10/2021

Sample Details

Sample ID / Client ID: NEWC21S-07897 / 033-Q06

Date Sampled: 24/09/2021

Source: Boral Seaham Quarry

Material: 20mm DGB + Ash

Specification: DGB - RMS 3051.1 (ED7) - Class 1 - Cat:A

Sampling Method: Submitted by client*

Project Location: Seaham, NSW

Sample Location: Quarry Stockpile 12916
 Lot A
 800t
 Blend Plant

Particle Size Distribution

Method: RMS T106, RMS T107

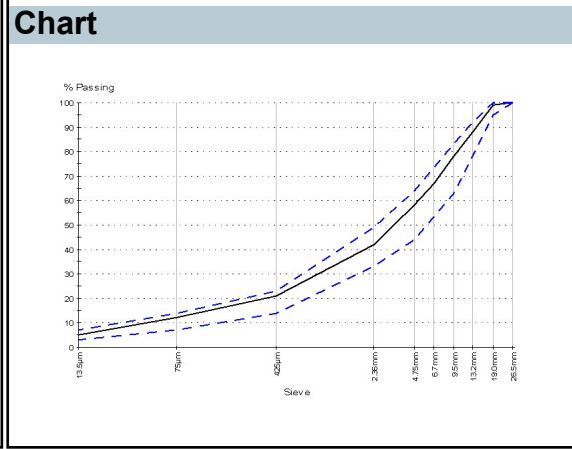
Drying by: Oven

Date Tested: 5/10/2021

| Sieve Size | % Passing | Limits |
|--------------------|-----------|-----------|
| 26.5mm | 100 | 100 |
| 19.0mm | 99 | 95 to 100 |
| 13.2mm | 88 | 78 to 92 |
| 9.5mm | 78 | 63 to 83 |
| 6.7mm | 67 | |
| 4.75mm | 58 | 44 to 64 |
| 2.36mm | 42 | 33 to 49 |
| 425µm | 21 | 14 to 23 |
| 75µm | 12 | 7 to 14 |
| 13.5µm | 5 | 3 to 7 |
| Sieve Range | % | |
| 19.0mm to 13.2mm | 11 | 7 to 17 |
| 13.2mm to 9.5mm | 10 | 8 to 16 |
| 9.5mm to 4.75mm | 20 | 14 to 24 |
| 4.75mm to 2.36mm | 17 | 8 to 18 |
| 2.36mm to 425µm | 20 | 14 to 28 |
| 425µm to 75µm | 9 | 6 to 13 |
| 75µm to 13.5µm | 6 | 3 to 7 |

Other Test Results

| Description | Method | Result | Limits |
|--|----------|----------------|--------|
| Misshapen Particles (%) | RMS T213 | 11 | ≤35 |
| Flat Particles (%) | | 10.5 | |
| Elongated Particles (%) | | 0.0 | |
| Flat & Elongated Particles (%) | | 0.0 | |
| Calliper Ratio | | 2:1 | |
| Unrounded PSD values used for fraction selection | | | |
| Date Tested | | 6/10/2021 | |
| Nominal Sample Size (mm) | RMS T215 | 20 | |
| Nature of Sample | | Crushed Rock | |
| Agg Size and Crush Details | | Constant Rate | |
| Fraction Size | | -19.0 + 9.5 mm | |
| Duplicate Testing Performed | | No | |
| Wet Strength (kN) | | 243 | ≥100 |
| Average Dry Strength (kN) | | 284 | |
| Wet/Dry Strength Variation (%) | | 14 | ≤35 |
| Breakdown Occurred | | No | |
| Cylinder Size (diameter in mm) | | 150 | |
| Date Tested | | 20/10/2021 | |
| Nominal Size of Aggregate (mm) | RMS T239 | 20 | |
| Type of Aggregate | | Crushed Rock | |
| Sieve Size Used(%) | | 6.70 mm | |
| Aggregate Passing Sieve (%) | | 0 | |
| Aggregate With No Fractured Faces (%) | | 0 | |
| Aggregate With At Least 1 Fractured Face (%) | | 100 | |
| Aggregate With 2 Or More Fractured Faces (%) | | 100 | ≥85 |
| Date Tested | | 21/10/2021 | |



Comments

*Results relate only to the items tested or sampled.


Falling Head Permeability Test Report

Report No: FPERM:NEWC21S-07897

Issue No:2

This report replaces all previous issues of report no. FPERM:NEWC21S-07897

| | |
|----------------------|--|
| Client: | Boral Quarries PO Box 607 Raymond Terrace NSW 2324 |
| Principal: | |
| Project No.: | TESTNEWC00046AA |
| Project Name: | Concrete, Soil and Aggregate Testing (Newcastle) |
| Lot No.: | - |
| TRN: | WSE-21/00033-Q06-Q10 |



Accredited for compliance with ISO/IEC 17025 - Testing.
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection and proficiency testing scheme providers reports.

G. Eveleigh

Approved Signatory: Greg Eveleigh
(Geotechnician)
NATA Site Number: Newcastle Laboratory
Date of Issue: 27/10/2021

Sample Details

| | |
|------------------------------------|----------------------|
| Project Location: | Seaham, NSW |
| Client Request ID: | |
| Laboratory test Procedures: | AS 1289.6.7.2 |
| Sampling Method: | Submitted by client* |

Sample Data

| | |
|-----------------------------------|--|
| Client Sample ID: | 033-Q06 |
| Date Sampled: | 24/09/2021 |
| Date Tested: | 05/10/2021 |
| Sample Location: | Quarry Stockpile 12916, Lot A, 800t, Blend Plant |
| Material/Soil Description: | 20mm DGB + Ash |

Test Conditions

| | | | |
|--|-----|--|---------------|
| Surcharge mass applied (kg) | 6.0 | Target Maximum Dry Density (%) | 98 |
| Surcharge pressure applied (kPa) | 3 | Target Optimum Moisture Content (%) | 100 |
| Material retained on 19.0mm sieve (%) | 0.0 | Maximum Dry Density (t/m³) | 2.11 |
| Oversize material discarded | Yes | Optimum Moisture Content (%) | 8.0 |
| | | MDD and OMC results from: | Newc21s-07897 |

Test Results

| | | | |
|---|------|--------------------------------------|----------|
| Specimen Wet Density (t/m³) | 2.20 | Laboratory Density Ratio (%) | 97.8 |
| Specimen Moisture Content (%) | 8.2 | Laboratory Moisture Ratio (%) | 102.5 |
| Specimen Dry Density (t/m³) | 2.07 | Compactive Effort | Modified |

Permeability Results

| | |
|---|----------------------------|
| Coefficient of Permeability k_{20°C} m/sec | 1 x 10⁻⁸ |
| Coefficient of Permeability k_{21°C} m/sec | 2 x 10⁻⁸ |

Comments:


Sample tested and reported as received from client.

Material Test Report

Report No: **NEWC21S-01417-1**

Issue No: **1**

| | |
|----------------------|--|
| Client: | Boral Quarries PO Box 607 Raymond Terrace NSW 2324 |
| Principal: | |
| Project No.: | TESTNEWC00046AA |
| Project Name: | Concrete, Soil and Aggregate Testing (Newcastle) |
| Lot No.: | TRN: |



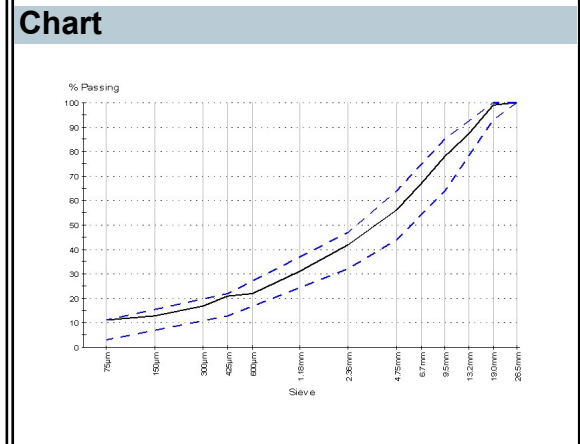
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Chris Blackford
 Approved Signatory: Chris Blackford
 (Geotechnician)
 NATA Accredited Laboratory Number:431
 Date of Issue: 15/03/2021

| Sample Details | |
|-------------------------------|---------------------------------------|
| Sample ID / Client ID: | NEWC21S-01417 / 007-Q02 |
| Date Sampled: | 24/02/2021 |
| Source: | Boral Seaham Quarry |
| Material: | 20mm Base 2% Ash |
| Specification: | ARRB 1995 (SR41) - 20mmBase Table3.1a |
| Sampling Method: | Submitted by client |
| Project Location: | Seaham, NSW |
| Sample Location: | Quarry Stockpile 10000T |

| Particle Size Distribution | | |
|----------------------------|------------------|---------------|
| Method: | AS 1289.3.6.1 | |
| Drying by: | Oven | |
| Date Tested: | 3/03/2021 | |
| Note: | Sample Washed | |
| Sieve Size | % Passing | Limits |
| 26.5mm | 100 | 100 |
| 19.0mm | 99 | 93 to 100 |
| 13.2mm | 87 | |
| 9.5mm | 78 | 64 to 85 |
| 6.7mm | 67 | |
| 4.75mm | 56 | 44 to 64 |
| 2.36mm | 42 | 32 to 47 |
| 1.18mm | 31 | |
| 600µm | 22 | |
| 425µm | 21 | 13 to 22 |
| 300µm | 17 | |
| 150µm | 13 | |
| 75µm | 11 | 3 to 11 |

| Other Test Results | | | |
|--|---------------|------------|--------|
| Description | Method | Result | Limits |
| Sample History | AS 1289.1.1 | Air-dried | |
| Preparation | AS 1289.1.1 | Dry Sieved | |
| Linear Shrinkage (%) | AS 1289.3.4.1 | 2.0 | |
| Mould Length (mm) | | 250 | |
| Crumbling | | No | |
| Curling | | No | |
| Cracking | | No | |
| Liquid Limit (%) | AS 1289.3.1.1 | 22 | |
| Method | | Four Point | |
| Plastic Limit (%) | AS 1289.3.2.1 | 18 | |
| Plasticity Index (%) | AS 1289.3.3.1 | 4 | 0 to 6 |
| Date Tested | | 4/03/2021 | |
| CBR at 5.0mm (%) | AS 1289.6.1.1 | 80 | |
| Dry Density before Soaking (t/m ³) | | 2.08 | |
| Density Ratio before Soaking (%) | | 100.0 | |
| Moisture Content before Soaking (%) | | 10.6 | |
| Moisture Ratio before Soaking (%) | | 103.5 | |
| Dry Density after Soaking (t/m ³) | | 2.08 | |
| Density Ratio after Soaking (%) | | 100.5 | |
| Swell (%) | | 0.0 | |
| Moisture Content of Top 30mm (%) | | 12.2 | |
| Moisture Content of Remaining Depth (%) | | 11.4 | |
| Compaction Hammer Used | | Standard | |
| Surcharge Mass (kg) | | 4.50 | |
| Period of Soaking (Days) | | 4 | |
| Retained on 19 mm Sieve (%) | | 4 | |
| CBR Moisture Content Method | AS 1289.2.1.1 | | |
| Sample Curing Time (h) | | 51 | |
| Plasticity Method | AS 1289.3.1.1 | | |
| Sample Moisture Content | AS 1289.2.1.1 | | |



Comments
 Samples tested and reported as received from client.

Material Test Report

Report No: NEWC21S-01417-1
Issue No: 1


Client: Boral Quarries
PO Box 607
Raymond Terrace NSW 2324

Principal:

Project No.: TESTNEWC00046AA

Project Name: Concrete, Soil and Aggregate Testing (Newcastle)

Lot No.: **TRN:**



Accredited for compliance with ISO/IEC 17025 - Testing. NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection and proficiency testing scheme providers reports.

Chris Blackford

Approved Signatory: Chris Blackford
(Geotechnician)
NATA Accredited Laboratory Number:431
Date of Issue: 15/03/2021

Sample Details

Sample ID / Client ID: NEWC21S-01417 / 007-Q02

Date Sampled: 24/02/2021

Source: Boral Seaham Quarry

Material: 20mm Base 2% Ash

Specification: ARRB 1995 (SR41) - 20mmBase Table3.1a

Sampling Method: Submitted by client

Project Location: Seaham, NSW

Sample Location: Quarry Stockpile
10000T

Particle Size Distribution

Method: AS 1289.3.6.1

Drying by: Oven

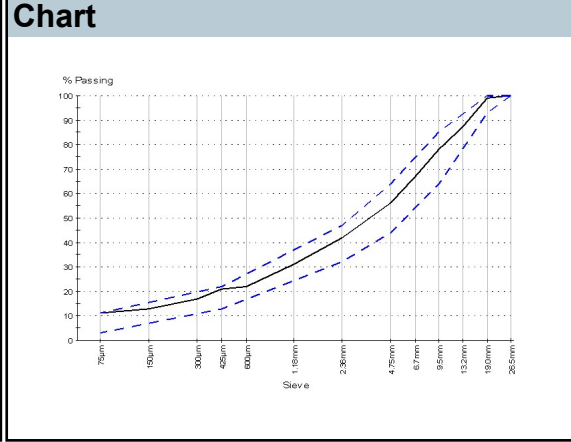
Date Tested: 3/03/2021

Note: Sample Washed

| Sieve Size | % Passing | Limits |
|------------|-----------|-----------|
| 26.5mm | 100 | 100 |
| 19.0mm | 99 | 93 to 100 |
| 13.2mm | 87 | |
| 9.5mm | 78 | 64 to 85 |
| 6.7mm | 67 | |
| 4.75mm | 56 | 44 to 64 |
| 2.36mm | 42 | 32 to 47 |
| 1.18mm | 31 | |
| 600µm | 22 | |
| 425µm | 21 | 13 to 22 |
| 300µm | 17 | |
| 150µm | 13 | |
| 75µm | 11 | 3 to 11 |

Other Test Results

| Description | Method | Result | Limits |
|-------------|--------|-----------|--------|
| Date Tested | | 4/03/2021 | |



Comments

Samples tested and reported as received from client.

Stabilment

PRODUCT DATA SHEET

BORAL

Stabilment is a specialised binder produced for soil stabilisation applications. It is manufactured from selected ground granulated blast furnace slag (GGBFS) and hydrated lime, as a nominal blend of 85:15.

USES

Stabilment is manufactured for the stabilisation of road base, sub-base and sub-grade materials and may be used in soils with either low or high plasticity.

Stabilment is suitable for applications such as in situ (including deep lift) stabilisation or pugmill blending. The mixing of pavement materials should be carried out using purpose built stabilising equipment.

Stabilment can also be used to modify soils with a high Plasticity Index (PI).

Addition rates of up to 6% by weight of suitable untreated materials can be expected.

Caution: As Stabilment is manufactured for stabilisation applications it is not recommended for use in other forms of construction.

COMPATIBILITY

Stabilment should not be blended with other cements.

SOIL PROPERTIES

It is essential that appropriate testing is carried out on all materials prior to using **Stabilment**.

STRENGTH

The strength of **Stabilment** measured as an Unconfined Compressive Strength (UCS) expressed in MegaPascals (MPa) is shown in the following graph. The materials tested were manufactured hard rock quarry products.

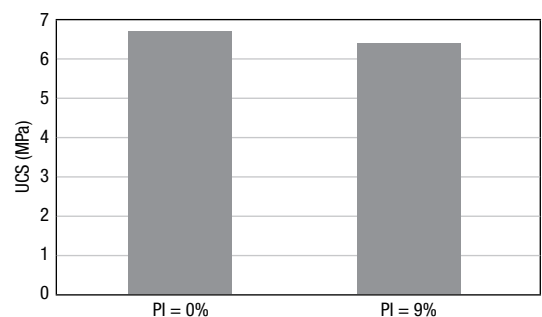
Two samples were chosen:

Sample 1: Maximum Dry Density (MDD) of 2.37t/m³ with a moisture content of 8.0% and P1 of 0%.

Sample 2: MDD of 2.30t/m³ with moisture content of 9.1% and P1 of 9%.

An additive rate of 4% **Stabilment** was used.

Unconfined Compressive Strength



Note: Test method used - RMS T131 7 Day Accelerated (AC) UCS. (Samples @ 1 hour after mixing binder)



Stabilment

PRODUCT DATA SHEET

WORKABILITY

Stabilment will generally exhibit a longer working time window than can be expected from portland cement based binders.

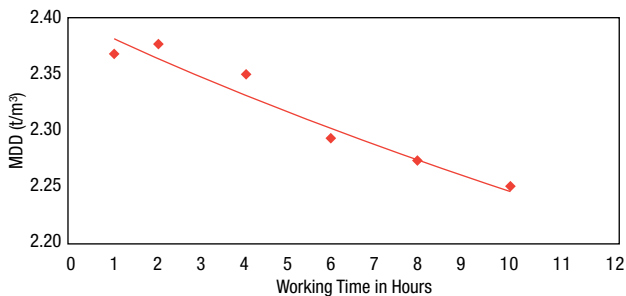
The Roads & Maritime Services (RMS) of New South Wales specifies working time for pavement materials in terms of effect on maximum dry density (MDD) and unconfined compressive strength (UCS) expressed in MegaPascals (MPa). Generally a maximum working time of 12 hours is specified.

Working time is determined by the following:

- Density = 97% of 1 hour test results.
- Strength = 80% of 1 hour test results whichever is the lesser.

Set out below are two graphs showing working times for both parameters using the DGB 20 (Sample 1) material with 4% **Stabilment** added.

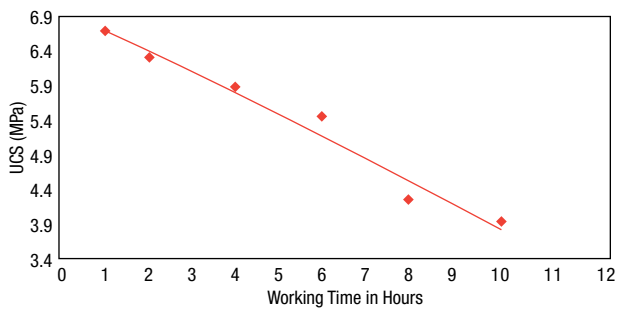
Maximum Dry Density: DGB20



MDD @ 1 hour = 2.37t/m³

- 97% of 1 hour result = 2.30t/m³
- Allowable working time = 6.25 hours (from the graph)

Unconfined Compressive Strength: DGB20

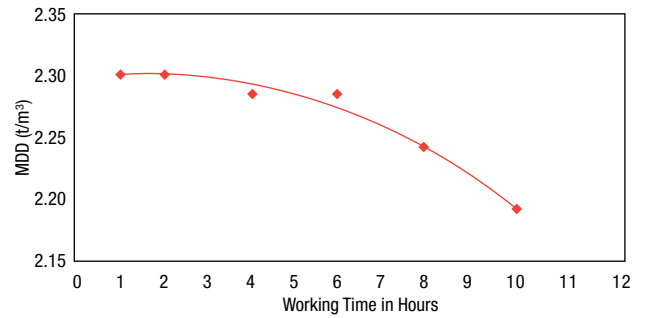


UCS @ 1 hour = 6.70 MPa

- 80% of 1 hour result = 5.36 MPa
- Allowable working time = 5.50 hours (from the graph)

The following graphs show working times for both parameters using the ROC (Sample 2) material with 4% **Stabilment** added.

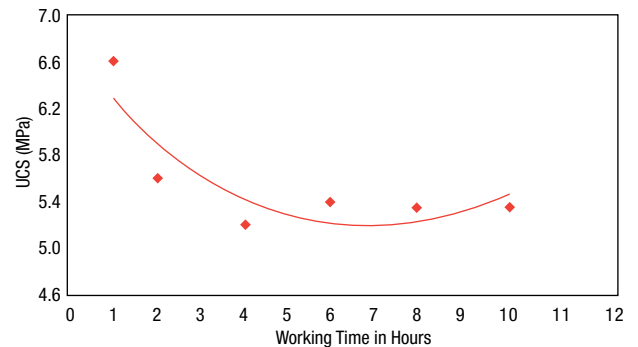
Maximum Dry Density: ROC



MDD @ 1 hour = 2.30t/m³

- 97% of 1 hour result = 2.23t/m³
- Allowable working time = 8.50 hours (from the graph)

Unconfined Compressive Strength



UCS @ 1 hour = 6.60 MPa

- 80% of 1 hour result = 5.28 MPa
- Allowable working time = 4.50 hours (from the graph)

Stabilment

PRODUCT DATA SHEET

REWORKABILITY

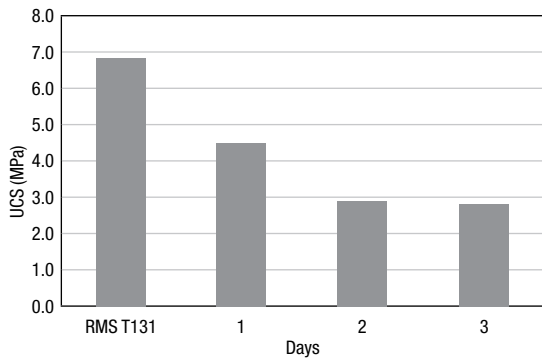
The reworkability of materials is affected by the soil type and the binder chosen. Materials treated with **Stabilment** have the potential to be reworked for up to three days depending on suitable test results.

Therefore problems such as levelling errors, rutting or other damage caused by either traffic or weather conditions can be rectified by reworking the material often without additional binder being required.

The following graphs show the effect on the unconfined compressive strength after reworking both samples over a three day period. An addition rate of 4% **Stabilment** was used.

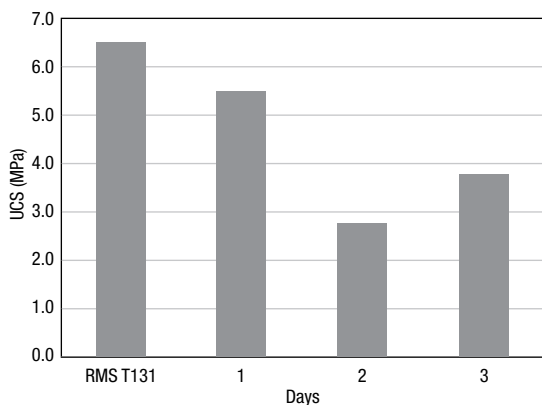
Sample 1: DGB20

Unconfined Compressive Strength



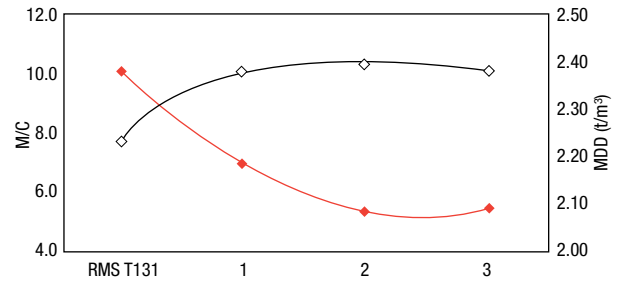
Sample 2: ROC

Unconfined Compressive Strength



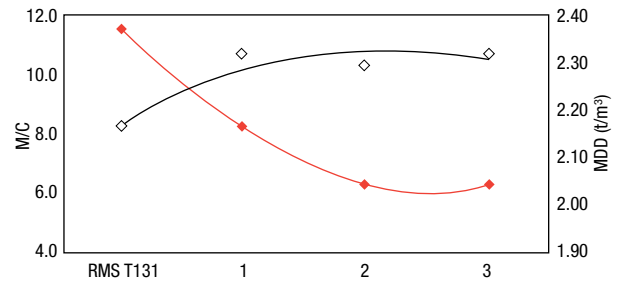
The following graphs show the effect of reworkability on the MDD and moisture contents (M/C) of both samples.

Sample 1: DGB20



◇ Moisture Content @ Compaction ◆ Dry Density Achieved

Sample 2:



◇ Moisture Content @ Compaction ◆ Dry Density Achieved

Test Method (Reworkability)

Four pairs of UCS cylinders were cast.

- One pair of cylinders were moulded and cured for 7 days at 65°C and tested (4 hr soak).
- One pair of cylinders were damp cured at 23°C for 24 hours broken down, remoulded and cured for 7 days at 65°C then tested (4 hr soak).
- One pair of cylinders were damp cured at 23°C for 48 hours broken down, remoulded and cured for 7 days at 65°C then tested (4 hr soak).
- One pair of cylinders were damp cured at 23°C for 72 hours broken down, remoulded and cured for 7 days at 65°C then tested (4 hr soak).

Stabilment

PRODUCT DATA SHEET

STORAGE

Contact with air and moisture will cause hydration of the cement properties. The "shelf life" of **Stabilment** is therefore dependent on storage conditions. It is recommended that **Stabilment** be retested prior to use if the age of the cement exceeds three months.

HANDLING

For further safety information consult the Boral Cement Material Safety Data Sheet for the product, available on our website www.boral.com.au

The information in this Data Sheet and any advice given should be viewed as a guide only. Boral makes no guarantee of the accuracy or completeness of the information and recommends you conduct your own testing to determine suitability for your specific purpose.

Revised: March 2012

Boral Cement

ABN: 62 008 528 523

NSW

Clunies Ross Street,
Prospect
NSW 2148
P.O. Box 42 Wentworthville,
NSW 2145
Telephone: (02) 9033 4000
Facsimile: (02) 9033 4055

Victoria

Telephone: 1800 673 570

Tasmania

Telephone: 1800 800 953

Product Support

Telephone: 1800 721 258



TECHNICAL DATA SHEET:
TYPICAL VALUES

BIDIM[®]

**Nonwoven
Geotextiles**

bidim geotextile is the most well known nonwoven geotextile product on the market today.

bidim leads the way in terms of technical performance and versatility and has applications in virtually every civil engineering construction project.

bidim nonwoven geotextiles provide an effective, economical solution to a range of engineering problems including weak soil, rutted and cracked roads and liquid and gas leaks from landfill sites.

bidim nonwoven geotextiles provide excellent filtration, separation and cushioning properties and feature a strong three-dimensional structure with high elongation. bidim nonwoven geotextiles also have a high melting point and high UV resistance.

All bidim nonwoven geotextiles are manufactured in Australia to ISO 9001 standards and are supported by a rigorous MQA process as well as being designed to meet the requirements of Australian and New Zealand road and rail authorities.

SECTOR SUITABILITY



Roads



Rail



Coastal



Waste



Mining



Civic &
Landscaping



Ports &
Aviation



Water



Primary
Industries



Sports &
Recreation



Slopes &
Walls



Building

BIDIM NON WOVEN GEOTEXTILES - A12 - A64 TYPICAL VALUES

Technical Data

| TEST | STANDARD | UNITS | A12 | | A14 | | A24 | | A34 | | A44 | | A64 | |
|--------------------------------------|------------|-----------------------|-------|-----|-------|------|-------|------|-------|-------|-------|-------|-------|-------|
| Mechanical Properties | | | | | | | | | | | | | | |
| Wide Strip Tensile Strength (MD/XMD) | AS3706.2 | kN/m | 8.0 | 8.0 | 11.0 | 11.0 | 14.0 | 14.0 | 18.5 | 18.5 | 26.5 | 26.5 | 37.5 | 37.5 |
| Wide Strip Toughness (MD/XMD) | AS3706.2 | kJ/m ² | 1.5 | 1.5 | 3.1 | 3.1 | 2.7 | 2.7 | 3.5 | 3.5 | 4.8 | 4.8 | 8.2 | 8.2 |
| Grab Tensile Strength (MD/XMD) | AS3706.2 | N | 500 | 500 | 720 | 720 | 850 | 850 | 1,270 | 1,270 | 1,850 | 1,850 | 2,620 | 2,620 |
| Trapezoidal Tear Strength (MD/XMD) | AS3706.3 | N | 200 | 200 | 300 | 300 | 345 | 345 | 440 | 440 | 590 | 590 | 830 | 830 |
| CBR Burst Strength | AS3706.4 | N | 1,500 | | 2,000 | | 2,500 | | 3,400 | | 4,650 | | 6,400 | |
| G Rating | Austrroads | - | 1,200 | | 1,550 | | 1,900 | | 2,510 | | 3,500 | | 5,100 | |
| Hydraulic Properties | | | | | | | | | | | | | | |
| Pore Size (095) | AS3706.7 | µm | 130 | | 110 | | 80 | | 75 | | 75 | | 75 | |
| Permittivity | AS3706.9 | s ⁻¹ | 3.40 | | 3.20 | | 2.65 | | 1.75 | | 1.35 | | 0.90 | |
| Coefficient of Permeability | AS3706.9 | m/s x10 ⁻⁴ | 43 | | 43 | | 43 | | 43 | | 43 | | 43 | |
| Flow Rate @ 100mm Head | AS3706.9 | l/m ² /sec | 340 | | 320 | | 265 | | 175 | | 135 | | 90 | |

The typical values published in this leaflet are to the best of our knowledge true and correct. The product specification may change at any time without prior notice. No warranty is expressed or implied. Manufactured by Geofabrics Australasia Pty Ltd in a facility certified to the ISO 9001 Quality Management System Standard.

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Appendix D: EPL21636



Environment Protection Licence

Licence - 21636

| Licence Details | |
|------------------------|----------|
| Number: | 21636 |
| Anniversary Date: | 24-March |

| Licensee |
|----------------------------|
| REMONDIS AUSTRALIA PTY LTD |
| 21D AND 21F SCHOOL DRIVE |
| TOMAGO NSW 2322 |

| Premises |
|---|
| TOMAGO RESOURCE RECOVERY FACILITY AND DEPOT |
| 21D AND 21F SCHOOL DRIVE |
| TOMAGO NSW 2322 |

| Scheduled Activity |
|---------------------------|
| Resource recovery |
| Waste storage |

| Fee Based Activity | Scale |
|--|---|
| Recovery of general waste | Any general waste recovered |
| Recovery of hazardous and other waste | Any hazardous and other waste recovered |
| Recovery of waste oil | > 1000-20000 T annual recovery capacity |
| Waste storage - hazardous, restricted solid, liquid, clinical and related waste and asbestos waste | Any listed waste type stored |
| Waste storage - other types of waste | Any other types of waste stored |

| Contact Us |
|---|
| NSW EPA |
| 4 Parramatta Square |
| 12 Darcy Street |
| PARRAMATTA NSW 2150 |
| Phone: 131 555 |
| Email: info@epa.nsw.gov.au |
| Locked Bag 5022 |
| PARRAMATTA NSW 2124 |



Environment Protection Licence

Licence - 21636

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Environment Protection Licence

Licence - 21636

Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).



Environment Protection Licence

Licence - 21636

The EPA publication “A Guide to Licensing” contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

| |
|-----------------------------------|
| REMONDIS AUSTRALIA PTY LTD |
| 21D AND 21F SCHOOL DRIVE |
| TOMAGO NSW 2322 |

subject to the conditions which follow.

Environment Protection Licence

Licence - 21636

1 Administrative Conditions

A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled development work listed below at the premises listed in A2:

Construction of a resource recovery facility in accordance with the conditions of consent for SSD-10447 approved by the Director, Industry Assessment for Department of Planning and Environment on 12 October 2021.

A1.2 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

| Scheduled Activity | Fee Based Activity | Scale |
|--------------------|--|---|
| Resource recovery | Recovery of general waste | Any general waste recovered |
| Resource recovery | Recovery of hazardous and other waste | Any hazardous and other waste recovered |
| Resource recovery | Recovery of waste oil | > 1000 - 20000 T annual recovery capacity |
| Waste storage | Waste storage - hazardous, restricted solid, liquid, clinical and related waste and asbestos waste | Any listed waste type stored |
| Waste storage | Waste storage - other types of waste | Any other types of waste stored |

A1.3 The scheduled activities listed in table A1.2 may only commence when this licence has been varied to remove reference to scheduled development work.

A2 Premises or plant to which this licence applies

A2.1 The licence applies to the following premises:

| Premises Details |
|---|
| TOMAGO RESOURCE RECOVERY FACILITY AND DEPOT |
| 21D AND 21F SCHOOL DRIVE |
| TOMAGO |
| NSW 2322 |
| LOT 8 DP 270328, LOT 11 DP 270328, LOT 2 DP 1278541 |

Environment Protection Licence

Licence - 21636

A3 Other activities

A3.1 This licence applies to all other activities carried on at the premises, including:

| Ancillary Activity |
|--|
| Waste processing (non-thermal treatment) |

A4 Information supplied to the EPA

A4.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:

- the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
- the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

A4.2 Works and activities must be carried out in accordance with the proposal contained in:

- the conditions of consent for SSD-10447 approved by the Director, Industry Assessment for Department of Planning, Industry and Environment on 12 October 2021;
- the Remedial Action Plan - 21D and 21F School Drive, Tomago by JM Environments on 17 July 2021;
- Environmental Impact Statement Remondis Australia Pty Ltd Tomago Resource Recovery Facility and Truck Parking Depot (SSD-10447) by Jackson Environment and Planning Pty Ltd on 1 December 2020;
- Response to Submissions Report Remondis Australia Pty Ltd Tomago Resource Recovery Facility and Truck Parking Depot (SSD-10447) by Jackson Environment and Planning Pty Ltd on 8 June 2021; and
- c) all additional information supplied to the EPA in relation to the development.

2 Discharges to Air and Water and Applications to Land

P1 Location of monitoring/discharge points and areas

P1.1 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

Water and land

| EPA Identification no. | Type of Monitoring Point | Type of Discharge Point | Location Description |
|------------------------|--------------------------------|-------------------------|--|
| 1 | Groundwater quality monitoring | | Groundwater bore at co-ordinates XY (Zone 56, 381033, 6367134) shown as MW4 in Figure 9. |

Environment Protection Licence

Licence - 21636

| | | |
|---|--------------------------------|--|
| 2 | Groundwater quality monitoring | Groundwater bore at co-ordinates XY (Zone 56, 380931, 6367399) shown as MW6 in Figure 9. |
| 3 | Groundwater quality monitoring | Groundwater bore at co-ordinates XY (Zone 56, 381085, 6367166) shown as MW7 in Figure 9. |
| 4 | Groundwater monitoring quality | Groundwater bore at co-ordinates XY (Zone 56, 381108, 6367235) shown as MW8 in Figure 9. |
| 5 | Groundwater quality monitoring | Groundwater bore at co-ordinates XY (Zone 56, 381110, 6367283) shown as MW9 in Figure 9. |

- P1.2 For the purposes of condition P1.1, Figure 9 refers to the figure titled "Proposed Groundwater Well Locations" dated 10/09/2020 within Appendix M3 of the Environmental Impact Statement - Remedial Action Plan 21D and 21F School Drive Tomago (DOC20/1033474-24).
- P1.3 The licensee must provide the EPA with an updated groundwater monitoring bore plan on completion of the bores MW7, MW8 and MW9. The plan must include at a minimum the GPS co-ordinates for all bores at the premises, datum, north point and cadastral layer.

3 Limit Conditions

L1 Pollution of waters

- L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Waste

- L2.1 There must be no waste received at the Premises.

L3 Hours of operation

- L3.1 Construction works at the premises must:
- only be undertaken between the hours of 7:00 am and 6:00 pm Monday to Friday;
 - only be undertaken between the hours of 8:00 am and 1:00 pm Saturday; and
 - not be undertaken on Sundays or Public Holidays.
- L3.2 Construction works outside of the hours identified in condition L3.1 may be undertaken in the following circumstances:
- no more than 5dB above Rating Background Level at any residence in accordance with the Interim Construction Noise Guideline (DECC, 2009); or
 - no more than the Noise Management Levels specified in Table 3 of the *Interim Construction Noise Guideline* (DECC, 2009) at other sensitive land uses; or
 - the delivery of materials requested by police or other authorised authorities for safety reasons; or
 - emergency work to avoid the loss of lives, property, and/or to prevent environmental harm; or

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e) other activities as agreed in writing by the Planning Secretary.

L4 Potentially offensive odour

L4.1 No condition of this licence identifies a potentially offensive odour for the purposes of section 129 of the Protection of the Environment Operations Act 1997.

Note: Section 129 of the Protection of the Environment Operations Act 1997, provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour.

L4.2 Prior to accepting any waste at the premises the licensee must prepare an Air Quality Management Plan in accordance with condition B36 of consent SSD-10447.

L5 Other limit conditions

L5.1 Prior to accepting any waste at the premises the licensee must provide the EPA with an Energy from Waste Management Plan in accordance with condition B8 of consent SSD-10447.

L5.2 Prior to accepting any waste at the premises the licensee must provide the EPA with a Water Management Plan in accordance with condition B26 of consent SSD-10447.

L5.3 Prior to accepting any waste at the premises, the licensee must provide to, and receive endorsement in writing from the EPA, a Financial Assurance proposal, prepared in accordance with the following NSW EPA documents:

- 1) Draft Financial Assurance Policy (2020); and
- 2) Estimating Financial Assurances: Draft Guideline on Independent Assessment of Costs (2020).

These guidelines are available at: <http://yoursay.epa.nsw.gov.au/assurances>

The Financial Assurance is to be an amount equivalent to the cost of all rehabilitation works associated with the premises.

Note: Once agreed to, the EPA will amend the licence to require the financial assurance to be provided in the form of an unconditional and irrevocable guarantee from an Australian bank, building society or credit union in favour of the NSW EPA and the requirement for the financial assurance will remain within the conditions of this environment protection licence.

L5.4 Prior to accepting any waste at the premises the licensee must provide the EPA with the Long-Term Environmental Management Plan in accordance with condition B17 of consent SSD-10447.

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4 Operating Conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.

This includes:

- a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
- b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:

- a) must be maintained in a proper and efficient condition; and
- b) must be operated in a proper and efficient manner.

O3 Dust

O3.1 All areas must be maintained, at all times, in a condition that effectively minimises the generation and emission of dust from the premises.

O3.2 Activities occurring at the premises must be carried out in a manner that will minimise the generation of dust from the premises.

O3.3 Trucks entering and leaving the premises that are carrying loads must be covered at all times, except during material inspection, unloading and loading.

O4 Emergency response

Note: The licensee must prepare, maintain and implement as necessary, a current Pollution Incident Response Management Plan (PIRMP) for the premises.

The licensee must develop their PIRMP in accordance with the requirements in Part 5.7A of the Protection of the Environment Operations Act 1997 (the POEO Act) and the POEO Regulations.

O5 Processes and management

O5.1 The licensee must comply with the requirements set out in the *EPA Standards for managing construction waste in NSW* as in force from time to time.

O5.2 All liquid waste, chemicals and fuels loading, unloading, storage recovery and general handling must occur undercover within bunded areas.

O5.3 All above ground tanks containing material that is likely to cause environmental harm must be bunded or have an alternative spill containment system in place.

O5.4 Bunds must:

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- a) have walls and floors constructed of impervious materials;
- b) be of sufficient capacity to contain 110% of the volume of the tank (or 110% volume of the largest tank where a group of tanks are installed);
- c) have floors graded to a collection sump; and
- d) not have a drain valve incorporated in the bund structure,

or be constructed and operated in a manner that achieves the same environmental outcome.

O5.5 The licensee must ensure:

- a) all vehicular access points to the premises are designed, constructed, maintained and stabilised to minimise vehicles tracking materials onto public roads and roads outside the premises as much as is reasonable and feasible;
- b) vehicle, motorised plant and equipment movements onto or off the premises minimise the deposition of any material onto the surface of roads outside of the premises;
- c) mud, splatter, dust and other material likely to fall from or be cast off the wheels, underside or body of any vehicle, trailer, motorised plant and equipment leaving the premises, is removed to the greatest extent practicable before it leaves the premises; and
- d) road surfaces subject to any tracking of material by vehicles leaving the premises must be cleaned as required to ensure compliance with a) and b) of this condition and condition L1.1 of this licence.

O6 Waste management

- O6.1 Any waste for processing, storage or resource recovery at the premises must be assessed and classified in accordance with the *EPA Waste Classification Guidelines* as in force from time to time.
- O6.2 All waste receipt, storage, handling and processing must be undertaken inside buildings at the premises.
- O6.3 Stockpiles of unsorted, sorted and processed waste must only be stored within clearly marked and signposted designated areas at the premises.
- O6.4 Each type of waste stored at the premises for recovery/recycling must be stockpiled separately.

O7 Other operating conditions

- O7.1 Stormwater/sediment control - Construction Phase
- O7.2 Prior to construction and remediation works (as defined in condition E2.1) at the premises the licensee must install bunding to contain runoff for a 24 hour rainfall event at 1% annual exceedance probability.
- O7.3 Measures must be implemented to control erosion and sediment during construction. *Managing Urban Stormwater: Soils and Construction* (available from the Department of Housing) provides guidance on the measures that should be implemented.
- O7.4 Prior to remediation works (as defined in condition E2.1) the licensee must install a control upgradient groundwater monitoring bore and downgradient groundwater monitoring bores MW7, MW8 and MW9 as specified in Figure 9 titled "Proposed Groundwater Well Locations" dated 10/09/2020 within Appendix M3 of

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the Environmental Impact Statement - Remedial Action Plan 21D and 21F School Drive, Tomago (DOC20/1033474-24). The installation of the groundwater monitoring bores must meet the minimum requirements as outlined in the *Minimum Construction Requirements for Water Bores in Australia, Fourth Edition, National Uniform Drillers Licensing Committee 2020* at <https://adia.com.au/wp-content/uploads/2020/09/Minimum-Construction-Requirements-Edition-4.pdf>.

- O7.5 The licensee must provide to the EPA with a bore construction report in accordance to section 15 of the *Minimum Construction Requirements for Water Bores in Australia, Fourth Edition, National Uniform Drillers Licensing Committee 2020* on completion of bores MW7, MW8 and MW9.

5 Monitoring and Recording Conditions

M1 Monitoring records

- M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.
- M1.2 All records required to be kept by this licence must be:
- in a legible form, or in a form that can readily be reduced to a legible form;
 - kept for at least 4 years after the monitoring or event to which they relate took place; and
 - produced in a legible form to any authorised officer of the EPA who asks to see them.
- M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
- the date(s) on which the sample was taken;
 - the time(s) at which the sample was collected;
 - the point at which the sample was taken; and
 - the name of the person who collected the sample.

M2 Requirement to monitor concentration of pollutants discharged

- M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:
- M2.2 Water and/ or Land Monitoring Requirements

POINT 1,2,3,4,5

| Pollutant | Units of measure | Frequency | Sampling Method |
|-----------|----------------------|---------------------|-----------------------|
| Arsenic | milligrams per litre | Special Frequency 1 | Representative sample |
| Cadmium | milligrams per litre | Special Frequency 1 | Representative sample |
| Chromium | milligrams per litre | Special Frequency 1 | Representative sample |

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| | | | |
|-----------------------------------|----------------------------------|---------------------|-----------------------|
| Copper | milligrams per litre | Special Frequency 1 | Representative sample |
| Dissolved Oxygen | milligrams per litre | Special Frequency 1 | Representative sample |
| Electrical conductivity | microsiemens per centimetre | Special Frequency 1 | Representative sample |
| Lead | milligrams per litre | Special Frequency 1 | Representative sample |
| Perfluorooctane sulphonate (PFOS) | milligrams per litre | Special Frequency 1 | Representative sample |
| Perfluorooctanoic acid (PFOA) | milligrams per litre | Special Frequency 1 | Representative sample |
| pH | pH | Special Frequency 1 | Representative sample |
| Redox potential | millivolts | Special Frequency 1 | Representative sample |
| Standing Water Level | metres (Australian Height Datum) | Special Frequency 1 | In situ |
| Zinc | milligrams per litre | Special Frequency 1 | Representative sample |

M2.3 For the purposes of the table above:

(a) Special Frequency 1 means the collection of samples monthly during remediation and post remediation work. Remediation work is defined in condition E2.1 of the licence.

M3 Testing methods - concentration limits

M3.1 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

M4 Weather monitoring

M4.1 For the purpose of complying with condition O7.2, R4.1 and other conditions of this Licence, rainfall data must be obtained from the Australian Bureau of Meteorology Williamtown RAAF weather station.

M5 Recording of pollution complaints

M5.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M5.2 The record must include details of the following:

- a) the date and time of the complaint;
- b) the method by which the complaint was made;
- c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
- d) the nature of the complaint;
- e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
- f) if no action was taken by the licensee, the reasons why no action was taken.

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- M5.3 The record of a complaint must be kept for at least 4 years after the complaint was made.
- M5.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M6 Telephone complaints line

- M6.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.
- M6.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.
- M6.3 The preceding two conditions do not apply until 3 months after the date of the issue of this licence.

6 Reporting Conditions

R1 Annual return documents

- R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:
1. a Statement of Compliance,
 2. a Monitoring and Complaints Summary,
 3. a Statement of Compliance - Licence Conditions,
 4. a Statement of Compliance - Load based Fee,
 5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan,
 6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and
 7. a Statement of Compliance - Environmental Management Systems and Practices.

At the end of each reporting period, the EPA will provide to the licensee notification that the Annual Return is due.

- R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

- R1.3 Where this licence is transferred from the licensee to a new licensee:
- a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
 - b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

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- R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:
- in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
 - in relation to the revocation of the licence - the date from which notice revoking the licence operates.
- R1.5 The Annual Return for the reporting period must be supplied to the EPA via eConnect *EPA* or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').
- R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.
- R1.7 Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:
- the licence holder; or
 - by a person approved in writing by the EPA to sign on behalf of the licence holder.

R2 Notification of environmental harm

- R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

- R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which they became aware of the incident.

R3 Written report

- R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
- where this licence applies to premises, an event has occurred at the premises; or
 - where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence, and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.
- R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.
- R3.3 The request may require a report which includes any or all of the following information:
- the cause, time and duration of the event;
 - the type, volume and concentration of every pollutant discharged as a result of the event;
 - the name, address and business hours telephone number of employees or agents of the licensee, or a

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specified class of them, who witnessed the event;

d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;

e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;

f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and

g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

R4 Other reporting conditions

R4.1 The licensee must provide the EPA with its Annual Return a groundwater monitoring report. The report must be prepared by an appropriately qualified and experienced person and include:

a) A graphical representation of the monitoring results required by condition M2.1 for the annual return period;

b) For each parameter required to be monitored by condition M2.1, provide a graph that compares the ANZECC Guideline trigger value with the monitoring results since monitoring began.

c) include daily rainfall data in graphical form.

7 General Conditions

G1 Copy of licence kept at the premises or plant

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

8 Special Conditions

E1 Environmental obligations of licensee

E1.1 While the licensee's premises are being used for the purpose to which the licence relates, the licensee must:

a) Clean up any spill, leak or other discharge of any waste(s) or other material(s) as soon as practicable after it becomes known to the licensee or to one of the licensee's employees or agents.

b) In the event(s) that any liquid and non-liquid waste(s) is unlawfully deposited on the premises, such waste(s) must be removed and lawfully disposed of as soon as practicable or in accordance with any direction given

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by the EPA.

c) Provide all monitoring data as required by the conditions of this licence or as directed by the EPA.

E1.2 In the event of an earthquake, storm, fire, flood or any other event where it is reasonable to suspect that a pollution incident has occurred, is occurring or is likely to occur, the licensee (whether or not the premises continue to be used for the purpose to which the licence relates) must:

- a) make all efforts to contain all firewater on the licensee's premises,
- b) make all efforts to control air pollution from the licensee's premises,
- c) make all efforts to contain any discharge, spill or run-off from the licensee's premises,
- d) make all efforts to prevent flood water entering the licensee's premises,
- e) remediate and rehabilitate any exposed areas of soil and/or waste,
- f) lawfully dispose of all liquid and solid waste(s) stored on the premises that is not already securely disposed of,
- g) at the request of the EPA monitor groundwater beneath the licensee's, and its potential to migrate from the licence premises,
- h) at the request of the EPA monitor surface water leaving the licensee's premises; and
- i) ensure the licensee's premises is secure.

E1.3 After the licensee's premises cease to be used for the purpose to which the licence relates or in the event that the licensee ceases to carry out the activity that is the subject of this licence, that licensee must:

- a) remove and lawfully dispose of all liquid and non-liquid waste stored on the licensee's premises; and
- b) rehabilitate the site, including conducting an assessment of and if required remediation of any site contamination.

E2 Additions to the definition of terms for the licence

E2.1 Remediation works means the removal of stockpiled wastes and lead impacted soils, consolidation of zinc impacted soils, installation of a geotextile membrane over the truck parking area and implementation of a long-term environmental management plan, as described in the RAP.

RAP means Remediation Action Plan prepared by JM Environments dated 17 July 2021.

ANZECC means Australian and New Zealand Guidelines for Fresh and Marine Water Quality (as in force from time to time).

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Dictionary

General Dictionary

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| 3DGM [in relation to a concentration limit] | Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples |
| Act | Means the Protection of the Environment Operations Act 1997 |
| activity | Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997 |
| actual load | Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009 |
| AM | Together with a number, means an ambient air monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> . |
| AMG | Australian Map Grid |
| anniversary date | The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act. |
| annual return | Is defined in R1.1 |
| Approved Methods Publication | Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009 |
| assessable pollutants | Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009 |
| BOD | Means biochemical oxygen demand |
| CEM | Together with a number, means a continuous emission monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> . |
| COD | Means chemical oxygen demand |
| composite sample | Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume. |
| cond. | Means conductivity |
| environment | Has the same meaning as in the Protection of the Environment Operations Act 1997 |
| environment protection legislation | Has the same meaning as in the Protection of the Environment Administration Act 1991 |
| EPA | Means Environment Protection Authority of New South Wales. |
| fee-based activity classification | Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009. |
| general solid waste (non-putrescible) | Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997 |

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| flow weighted composite sample | Means a sample whose composites are sized in proportion to the flow at each composites time of collection. |
| general solid waste (putrescible) | Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997 |
| grab sample | Means a single sample taken at a point at a single time |
| hazardous waste | Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997 |
| licensee | Means the licence holder described at the front of this licence |
| load calculation protocol | Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009 |
| local authority | Has the same meaning as in the Protection of the Environment Operations Act 1997 |
| material harm | Has the same meaning as in section 147 Protection of the Environment Operations Act 1997 |
| MBAS | Means methylene blue active substances |
| Minister | Means the Minister administering the Protection of the Environment Operations Act 1997 |
| mobile plant | Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997 |
| motor vehicle | Has the same meaning as in the Protection of the Environment Operations Act 1997 |
| O&G | Means oil and grease |
| percentile [in relation to a concentration limit of a sample] | Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence. |
| plant | Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles. |
| pollution of waters [or water pollution] | Has the same meaning as in the Protection of the Environment Operations Act 1997 |
| premises | Means the premises described in condition A2.1 |
| public authority | Has the same meaning as in the Protection of the Environment Operations Act 1997 |
| regional office | Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence |
| reporting period | For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 months. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act. |
| restricted solid waste | Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997 |
| scheduled activity | Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997 |
| special waste | Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997 |
| TM | Together with a number, means a test method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> . |



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| TSP | Means total suspended particles |
| TSS | Means total suspended solids |
| Type 1 substance | Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements |
| Type 2 substance | Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements |
| utilisation area | Means any area shown as a utilisation area on a map submitted with the application for this licence |
| waste | Has the same meaning as in the Protection of the Environment Operations Act 1997 |
| waste type | Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non - putrescible), special waste or hazardous waste |

Ms Natasha Ryan

Environment Protection Authority

(By Delegation)

Date of this edition: 24-March-2022

End Notes