

Intended for
John Holland Rail

Document type
Report

Date
September 2019

TARAGO LOOP EXTENSION FURTHER INTRUSIVE ASSESSMENT AND LEAD MANAGEMENT PLAN

TARAGO LOOP EXTENSION FURTHER INTRUSIVE ASSESSMENT AND LEAD MANAGEMENT PLAN

Project name **Tarago Crossing Loop Extension**
Project no. **318000780**
Recipient **Wayne D'Souza**
Document type **Report**
Report ref. **318000780-01**
Version **3**
Date **11/09/2019**
Prepared by **Stephen Maxwell**
Checked by **Fiona Robinson**
Approved by **Fiona Robinson**
Description **This report presents the results of further intrusive soil assessment and a lead management plan for the proposed extension of the Tarago Loop.**

Ramboll
Level 18
50 Glebe Road
PO Box 435
The Junction
NSW 2291
Australia

T +61 2 4962 5444
F +61 2 4962 5888
<https://ramboll.com>

CONTENTS

1.	Introduction	1
1.1	Preamble	1
1.2	Proposed Construction	1
1.3	Previous Investigation	1
1.4	Site Identification	2
1.5	Objectives	2
2.	Sampling and Analysis Quality Plan	3
2.1	Data Quality Objectives	3
2.2	Data Quality Indicators	5
3.	Fieldwork	7
3.1	Scope Summary	7
3.1.1	Assessment of Lead in the Siding and Surrounds	7
3.1.2	Assessment of Lead in the Main Line	8
3.1.3	Signal Trench Assessment	8
3.2	Quality Assurance and Quality Control	8
4.	Field Observations	12
4.1	Site Geology	12
4.2	Field Observations	12
5.	Assessment Criteria	13
6.	Results	14
6.1	XRF	15
6.2	Dust Monitoring	17
7.	Conceptual Site Model	19
8.	Regulatory Consideration	21
8.1	SafeWork NSW	21
8.2	Contaminated Land Management Act	21
8.3	State Environmental Planning Policy 55: Remediation of Land	22
9.	Conclusion	23
10.	Limitations	24
11.	References	25

TABLES

Table 2-1: Data Quality Objectives	3
Table 2-2: Data Quality Indicators	5
Table 2-3: Sampling Plan	6
Table 3-1: QA/QC Sampling and Analysis Methodology Assessment	8
Table 3-2: QA/QC – Field and Lab Quality Assurance and Quality Control	9
Table 3-3: QA/QC – Assessment of DQIs	10
Table 4-1: Summary of Observed Geology	12
Table 6-1: Soil lead results from surface layers.	14
Table 6-2: XRF Results - Lead	16
Table 6-3: Dust Monitoring Results	17
Table 7-1: Exposure Pathway Assessment	19

1. INTRODUCTION

1.1 Preamble

Ramboll Australia Pty Ltd (Ramboll) was commissioned by John Holland Rail (JHR) to undertake further intrusive assessment and provide a lead management plan for spoil to be generated during the proposed extension of the Tarago Loop. The proposed construction footprint is here-in referred to as "the site" and occurs within the rail corridor shown in **Figure 1**.

This report exclusively considers lead impacted soils to be disturbed as part of the Tarago Loop Extension. Potential exists for contamination to remain within the rail corridor adjacent the site. The Human Health Risk Assessment (HHRA), concurrently being developed, will improve capacity to assess risks associated with potential remnant impacts.

1.2 Proposed Construction

Proposed works include installation of signal services from CH: 261.500 km (northern city end) and CH: 265.200 km (southern country end). In addition to signal works, construction north of the Goulburn Street level crossing is understood to include excavation of the former Woodlawn Siding, extension of the existing loop, construction of a driver's walkway adjacent the existing loop, removal of tie-ins from the former Woodlawn siding to the existing loop, modification of tie-ins from the loop to the Goulburn – Bombala line (the main line), restoration of drainage between lines and reconditioning of the main line rail formation. For the purpose of this report a total excavation depth of up to 0.95 m was nominated including 0.3 m ballast, 0.15 m capping and 0.5 m structural base/subgrade.

1.3 Previous Investigation

A previous preliminary site investigation found lead levels exceeding relevant human-health guideline values in certain parts of the site (McMahon 2015). Based on review of this report Ramboll concluded:

1. A siding adjacent to the Tarago Station (the Woodlawn siding) was historically used to load lead ore from the former Woodlawn mine and this practice is identified as a source of potential contamination at the site
2. Intrusive assessment included composite sampling and analyses for a broad range of contaminants and identified contamination limited to lead along approximately 870 lineal meters of rail corridor (CH: 261.980 km to CH: 262.850 km) within the site including the siding historically used to load lead ore. Ramboll recommended that the results of composite sampling as described in McMahon (2015) should be used to screen the potential presence / absence of impacts only. Factoring required when interpreting composite sample results (i.e. multiplying reported concentrations by the number of sub-samples) can lead to conservative interpretation of the degree of impact and composite sample results (as described) should not be relied upon to assess risk associated with lead exposure
3. Further assessment of the degree and extent of lead impact between CH: 261.980 km and CH: 263.000 km was recommended
4. Further assessment of the Proposed Tarago Loop north of CH: 261.980 km was not considered warranted at the time and construction can proceed in this area without requirement for management measures associated with contamination. This includes construction of the signal trench in this area
5. Construction of signal trench from CH: 263.027 km (the Goulburn Street level crossing) to CH: 265.200 km (the country end of the Crisps Creek Intermodal Facility) can occur without requirement for management measures associated with contamination.

1.4 Site Identification

The site is located off Goulburn Street, Tarago, New South Wales (NSW) 2580. Reference to the Spatial Information Exchange (NSW Dept of Finance and Services 2019) identifies the site forms part of forms part of Lot 1 DP 595856). Reference to design drawings identifies construction is proposed within approximately 3.7 km of the rail corridor from CH: 261.500 to CH: 265.200. The site (as a function of historically identified contamination within the proposed construction footprint) falls within approximately 1,000 lineal meters of rail corridor from Chainage (CH): 261.950 km to CH: 263.000 km (as distance from Sydney, New South Wales) and occupies an area of approximately two hectares. Tarago Station is located adjacent and east of the site at CH: 262.500 km.

A locality plan is presented as **Figure 3, Appendix 1**.

1.5 Objectives

Objectives of this engagement were:

1. Undertake further intrusive assessment of the degree and extent of lead within the previously identified area of lead impact at the site including waste classification to inform consideration of offsite disposal of lead impacted spoil (if required)
2. Undertake a similar investigation of the 4 km signaling trench, as identified by JHR
3. Develop a Lead Management Plan integrating:
 - a. Management measures to be implemented during construction and temporary stockpiling of lead impacted spoil within the rail corridor
 - b. Management measures to facilitate permanent retention of lead impacted spoil within the rail corridor
 - c. Medical surveillance of construction workers (if required)
4. Provide advice based on the findings of triggers to notify SafeWork NSW and the NSW EPA under Section 60 of the CLM Act.

2. SAMPLING AND ANALYSIS QUALITY PLAN

2.1 Data Quality Objectives

Ramboll developed Data Quality Objectives (DQOs) and Data Quality Indicators (DQIs) for the revised characterisation using the US EPA seven-step DQO process, endorsed in Schedule B2 of NEPM (2013). The DQOs set quality assurance and quality control parameters for the field and laboratory program to ensure data of appropriate reliability has been used in assessment of the area of previously identified lead impact and the proposed signal trench.

The DQOs outlined below focus on the assessment of contamination in soil (**Table 2-1**).

Table 2-1: Data Quality Objectives

DQO	Outcome
State the Problem	<p>Previous investigations within the proposed Tarago Loop Extension identified lead in soils at concentrations that present potential risks to human health and the environment.</p> <p>Ancillary development outside the main construction area and area of previous investigation includes installation of an underground signal trench. Assessment of common rail corridor contaminants is required to inform management of spoil that will be generated.</p>
Identify the Decision	<ol style="list-style-type: none"> 1. Is the data collected of sufficient quality to identify impacts to meet the project objectives? 2. What is the degree and extent of lead impacts in soil? 3. What is the degree and extent of common rail corridor contaminants within the proposed signal trench alignment? 4. What management measures are required to mitigate risks associated with contamination during Tarago Loop extension and signal trench construction?
Identify Inputs to the Decision	<ol style="list-style-type: none"> 1. Visual assessment of topography and surface soils to identify potential contamination and contaminant migration pathways 2. Intrusive assessment of the soil profile including sampling and analysis of soil samples representative of soil horizons within the previously identified area of lead impact and the signal trench
Define the Study Boundaries	<p>Spatial boundaries include</p> <ol style="list-style-type: none"> 1. The Woodlawn Siding rail formation (CH: 261.980 km to CH: 263.000 km) soils to a maximum depth of 0.95 m (as required to facilitate assessment of ballast, capping and structural base) and adjacent shallow soils to the west. 2. The proposed signal trench alignment south of the previously investigated area (CH: 263.027 km to CH: 265.200 km) to a depth of one meter. 3. The main line from CH: 261.950 km to CH: 263.070 km 4. Siding tie-ins and the loop line from CH: 262.350 km to 262.750 km
Develop a Decision Rule	<p>The statistical parameters of interest are the concentrations of lead identified as chemical of potential concern (COPC). The action levels are the Assessment Criteria outlined in Section 5.</p> <p>The decision rules for this investigation are as follows:</p> <ol style="list-style-type: none"> 1. If it is determined that the data generated through this investigation is reliable, complete, comparable, accurate and representative then this information will be used to address the assessment objectives.

	<ol style="list-style-type: none"> 2. If it is determined that the data generated through this investigation is not suitable, comprehensive or reliable for use in achieving the goals of the study, then further investigations may be recommended to reduce uncertainties. 3. If it is determined that insufficient information is available to make conclusions on the risk to ecological receptors, then further information may be required. 4. All sample analyses are to be conducted using National Association of Testing Authorities (NATA) registered methods in accordance with ANZECC (1996) and NEPC (1999) guidelines. 5. All samples are to be appropriately preserved and handled in accordance with the sampling methodology outlined in Step 7. 6. PQLs are to be less than the adopted assessment criteria. 7. Duplicates, spikes, blanks and control samples are to meet the DQIs presented in Step 6.
<p>Specify Limits on Decision Errors</p>	<p>The potential for significant decision errors are minimised by:</p> <ol style="list-style-type: none"> 1. Completion of a quality assurance/ quality control (QA/QC) assessed of the investigation data to assess if the data satisfies the DQIs; 2. Assessment of whether appropriate sampling and analytical densities were completed for the purposes of the investigation; and 3. Ensuring that the criteria set for the investigation were appropriate for the proposed use of the site.
<p>Optimise the Design for Obtaining Data</p>	<p>Previous investigations conducted at the site used composited samples which introduced uncertainties in data interpretation. Ramboll designed the investigation to collect discrete samples at distinct soil layers at the site to determine vertical stratification in lead concentrations across the site. This would allow characterisation of lead contamination and its delineation across the site.</p>

2.2 Data Quality Indicators

DQIs have been established to set acceptance limits on field and laboratory data collected as part of the soil and surface water program. The DQIs are outlined in **Table 2-2**.

Table 2-2: Data Quality Indicators

DQI	Field	Laboratory
Completeness – a measure of the amount of useable data from a data collection activity	All critical locations sampled. Experienced sampler. Documentation correct.	All critical samples analysed. All analysis completed according to standard operating procedures. Appropriate methods Appropriate Practical Quantitation Limits (PQLs).
Comparability – the confidence that data may be considered to be equivalent for each sampling and analytical event	Experienced sampler. Climatic conditions noted during sampling. Same types of samples collected using approved sampling methods.	Same analytical methods used. Same sample PQLs. Same NATA accredited laboratories used. Same units.
Representativeness – the confidence that data are representative of each medium present on-site.	Appropriate media sampled.	All samples analysed according to standard operating procedures.
Precision – a quantitative measure of the variability of the data.	Collection of intra-laboratory duplicates at a rate of 1 in 20 primary samples. Collection of inter-laboratory duplicate samples at a rate of 1 in 20 primary samples.	Analysis of field duplicate samples, relative percent difference (RPDs) to be $\leq 30\%$. Laboratory duplicates analysed, RPDs to be $\leq 30\%$.
Accuracy – a quantitative measure of the closeness of the reported data to the “true” value.	Sampling methodologies appropriate and complied with. Collection of background samples.	Analysis of: Method blanks Matrix spikes Surrogate spikes Laboratory control samples Results for blank samples to be non-detect. Results for spike samples to be between 70% and 130%.

A sampling plan was developed in accordance with the DQOs. Elements of the sampling plan are shown in **Table 2-3**.

Table 2-3: Sampling Plan

Method	Requirements	Chemical Analysis
Test pitting within the area of lead impact	<p>Discrete samples were to be collected from distinct soil profiles identified from each test pit. Samples were to be taken from undisturbed material in the test pit and logged.</p> <p>Samples were to be collected at a rate of 3 per test pit. Testpits were to be excavated at an interval of 100 m at rail siding (previously identified lead contamination) and at approximate 400 lineal meter intervals along the proposed signal trench alignment.</p>	<p>Lead in all samples.</p> <p>Analyses of six samples from ballast for TRH, BTEX, PAH, 8 metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Hg) and asbestos.</p> <p>Analyses of three samples from the medium impact area for TCLP lead to facilitate waste classification</p> <p>Analyses of three samples from the high impact area for ASLP lead to inform consideration of ecological exposure via leachate in surface water.</p>
Shallow soil sampling within / around the area of lead impact	<p>Shallow soil (0-0.1m) samples were to be collected from adjacent (west and east) of the rail siding, from cess drains considered likely to receive runoff from the lead impacted area and from grassed land further west of the lead impacted area.</p>	
Testpitting within the southern signal trench alignment	<p>A total of two discrete samples were to be collected from each test pit including one shallow and one deeper sample.</p>	<p>Analyses of shallow soil samples for TRH, BTEX, PAH, 8 metals (As, Cd, Cr, Cu, Pb, Ni, Zn, Hg) and asbestos.</p>
Surface soil sampling within the main rail line	<p>Field measurement of lead concentrations within the main rain line were to be collected on 25 to 50 lineal meter increments from CH: 261.900 to CH:263.00 using x-ray fluorescence (XRF) technology.</p>	<p>XRF reading for lead.</p>

3. FIELDWORK

3.1 Scope Summary

The following scope of work was undertaken to complete the site intrusive assessment and reporting:

- Mobilisation to the site on 26 July 2019
- Site walk-over and allocation of test pit sites
- Collection of soil samples from site test pits and surface soils
- Remobilisation 12 August 2019
- Collection of shallow soil samples targeting 'tie-ins' to the loop and main rail line and targeting refined delineation of impacts at the northern end of site
- Remobilisation 27 August 2019
- Collection of shallow soil samples targeting:
 - Soils adjacent (west) of the Woodlawn Siding between CH 261.980 and CH 262.260 to assess lead in a route proposed to access northern areas of the site which are not impacted by lead
 - Ballast fines in the loop line
 - Submission of samples to the laboratory to inform consideration of risks associated with lead and to inform management options (including waste classification for offsite disposal)
- Remobilisation 31 August 2019
- Field measurements of lead concentrations in the main rail line using a hand held x-ray fluorescence (XRF) measurement device between CH: 261.950 km and 263.000 km
- Field measurement of dust generated during construction works around CH: 262.300 using a hand held DustTrak real-time dust monitor
- Preparation of this report presenting investigation results and lead management plan

Fieldwork over this period also included surface water sampling though this is considered under a separate Surface Water Monitoring report (Ramboll 2019).

3.1.1 Assessment of Lead in the Siding and Surrounds

Assessment of lead impact included:

- Advancement of nine test pits (TP1 to TP9) on approximate 100m lineal increments through the Woodlawn Siding rail formation along the approximate 900 m where elevated lead concentrations were considered likely to exist (based on review of historic assessment).
 - Soil conditions were logged for each of the nine test pits
 - Discrete soil samples were collected from each of the three distinct layers of material present within the test pit. This included the top ballast layer (mostly fines), middle capping layer and bottom structural base/subgrade.
 - Each sample was labelled with unique sample name (including approximate sample depth), date and location
- Collection of 51 shallow soil samples including:
 - 12 samples collected adjacent (west of) the Woodlawn Siding between test pit locations to refine assessment extent of lead impacts
 - Five samples collected from grassed land west of the Woodlawn Siding to assess potential presence of lead between the rail corridor access road (by which it is assumed ore was historically transported to the siding) and the Woodlawn Siding where loading of ore onto rail cars is understood to have occurred

- Five sediment samples from cess drains feeding two culverts within the area of previously identified impact
- Eight samples from within the Woodlawn siding targeting the northern end of site and 'tie-ins' to the active loop and main line.
- Six samples from ballast fines in the loop line between CH 262.440 and CH 262.750

3.1.2 Assessment of Lead in the Main Line

Field measurement of lead in the main line occurred on 25 – 50m lineal increments at 29 locations and included:

- Hand removal of upper 0.1 – 0.3 m of ballast to expose fines between tracks and in the western shoulder of the main line formation
- XRF measurement of lead of exposed fines in the shoulder and between tracks
- Averaging of shoulder and in-track readings to define a representative impact at each location

3.1.3 Signal Trench Assessment

Assessment of the 2 km signalling trench alignment south of the Goulburn Street level crossing included advancement of five test pits (TP10 – TP14) on 400m lineal increments. Two samples were excavated, and sampling was conducted as described above.

Test pit locations are shown on **Figure 3, Appendix 1**. A photographic log is presented as **Appendix 2**. Test pit logs are presented as **Appendix 3**.

3.2 Quality Assurance and Quality Control

The fieldwork program was undertaken in accordance with the DQOs and DQIs outlined in **Section 2**. Specific field quality control measures implemented are described in **Table 3-1**. Assessment of data completeness, comparability, representativeness, precision and accuracy based on field and laboratory considerations, as outlined in NEPC (2013) guidelines is presented in **Table 3-2**. A quality assurance assessment of the DQIs for this report is presented in **Table 3-3**.

Table 3-1: QA/QC Sampling and Analysis Methodology Assessment

Sampling Methodology	Ramboll’s Assessment
Sample Collection Method	Sub-surface soil samples were collected from undisturbed material inside the excavated test pits. Shallow soil samples were collected using a shovel to excavate 0-0.1m. All samples were collected using disposable nitrile gloves that were changed between sampling locations.
Decontamination Procedures	Decontamination was not required as samples were collected directly into laboratory-supplied soil sampling bags or jars using a gloved hand. New gloves were worn for each sample collection.
Sample Handling and Storage	Samples were collected into laboratory-supplied soil sampling bags or jars. Samples were stored in a chilled esky in the field and in transit to the laboratory.
Chain of Custody	The samples were dispatched to the laboratory under chain of custody conditions.

Table 3-2: QA/QC – Field and Lab Quality Assurance and Quality Control

Field and Lab QA/QC	Ramboll Assessment
Field quality control samples	<p>Two intra-laboratory duplicate samples and two inter-laboratory duplicates were analysed for 69 primary soil samples resulting in a percentage of 2.9% for each.</p> <p>The duplicate percentages achieved fall below the targeted 5% and while this infers some uncertainty, in combination with the laboratory quality control samples, this is not considered prohibitive of reliance on the data set.</p>
Field quality control results	<p>Duplicate results are included in Appendix 4. Relative percent differences (RPDs) were calculated for duplicate and primary sample pairs. For the assessment of RPDs, it is noted that concentrations close to the practical quantitation limit (PQL) will have higher RPDs. As such, a range of RPDs were considered as requiring further assessment, as follows:</p> <ul style="list-style-type: none"> • RPD >30% where both sample results exceed 20 times the PQL. • RPD > 50% where both sample results are within 10 to 20 x PQL • RPD no limit where one or both sample results are <10 x PQL <p>Assessment of duplicate performance identified two RPDs >30% (72.7%, 79.1% and 144.8%) where all samples exceeded 2 times the PQL. The associated primary samples all fell below the adopted site assessment criteria and are considered likely representative of relatively minor heterogeneity in lead content within the samples. The result indicates that there is variability in lead concentrations within the soil samples. These RPDs are not considered to detract from characterisation of areas with impacts below site criteria or characterisation of areas of medium and high lead impact (as presented later in this report) which are generally separated by orders of magnitude in lead concentration.</p>
NATA registered laboratory and NATA endorsed methods	Eurofins MGT was used as the primary laboratory. Eurofins MGT’s laboratory certificates are NATA stamped and are accredited for the analyses performed for this assessment.
Analytical methods	A summary of analytical methods were included in the laboratory test certificates.
Holding times	Review of the COCs and laboratory certificates indicate that holding times were met.
Practical Quantitation Limits (PQLs)	PQLs for the soil analytes were below the assessment criteria.
Laboratory quality control samples	Laboratory quality control samples including duplicates, laboratory control samples, matrix spikes, surrogate spikes and blanks were undertaken by the laboratories at appropriate frequencies.
Laboratory quality control results	All results for laboratory soil duplicates, laboratory control samples and surrogates were acceptable.

Table 3-3: QA/QC – Assessment of DQIs

DQI	Ramboll Assessment
Completeness	<p>Completeness is a measure of whether all the data necessary to meet the project objectives was collected.</p> <p>The sampling pattern for historically identified lead impacts included nine test pits advanced through the Woodlawn Siding (where impact was previously defined) on systematic 100 lineal meter increments. 51 shallow soil samples were also collected from targeted locations adjacent the siding at the base of the rail formation and in drainage lines.</p> <p>XRF assessment occurred at 29 locations on systematic 25 – 50 m lineal increments within the main line.</p> <p>The sampling plan for the proposed signal trench included five test pits advanced on 400 lineal meter increments south of the Goulburn Street level crossing.</p> <p>The combination of systematic and targeted assessment is considered to provide adequate data to meet the project objectives.</p>
Comparability	<p>Comparability is a measure of confidence that the data may be considered to be equivalent for each sampling and analysis event.</p> <p>The field investigations were completed by experienced personnel from Ramboll using standard operating procedures.</p> <p>The laboratory analysis was undertaken by NATA registered laboratories using accredited analytical methods.</p> <p>At several locations duplicate XRF measurements were observed to ensure comparability of in field measurements.</p>
Representativeness	<p>Representativeness is the confidence that the data is representative of each media present at the site.</p> <p>Sampling was completed to supplement an existing dataset from McMahon (2015).</p> <p>A total of 59 soil samples were collected to delineate the extents of lead impacts across nine test pits and 22 discrete shallow sampling points. The sampling density achieved is considered to inform assessment of the degree of contamination sufficiently to assess risks and develop management options during construction.</p> <p>A total of 58 XRF readings (29 pairs) were collected to delineate the extent of lead impacts in the main line. The sampling density achieved is considered to inform assessment of the degree of contamination sufficiently to assess risks and develop management options during construction.</p> <p>A total of ten samples were collected across five test pits to assess potential contamination in the signal trench south of the Goulburn Street level crossing.</p>
Precision	<p>Precision is a measure of the reproducibility of the data.</p> <p>In the field, Ramboll achieved precision by using standard operating procedures for the collection of soil samples and by collecting duplicate and triplicate samples for analysis. As outlined in Table 3-2, RPD results for duplicate samples indicated heterogeneity in the lead concentrations however these were not considered significant in the context of the assessment.</p> <p>At the laboratory, precision was assessed using blind duplicates samples and split duplicates. As outlined in Table 3-2, RPDs were acceptable and no detections were made in blank samples.</p>
Accuracy	<p>Accuracy is a measure of the closeness of a measurement to the true parameter value.</p>

DQI	Ramboll Assessment
	<p>In the field, Ramboll achieved accuracy by using standard operating procedures for the collection of soil including background samples to prevent cross contamination. No PFAS compounds were</p> <p>At the laboratory, precision was assessed using blind duplicate samples, method blanks, laboratory control samples and spikes. All results for laboratory control samples were within acceptable ranges.</p> <p>The XRF was used by a trained and licensed operator and calibrated in accordance with operating instructions before use. Additionally two blank measurements were recorded during use to support confirm instrument accuracy.</p>

It is considered that the data obtained adequately complied with the DQIs stated in **Section 2** and that the data is of suitable quality to meet the project DQO's objectives.

4. FIELD OBSERVATIONS

4.1 Site Geology

Conditions generally found at the site during the subsurface investigations are outlined in **Table 4.1**. Further details are provided in field sheets and test pit logs in **Appendix 3**.

Table 4-1: Summary of Observed Geology

Location	Approximate depth	Lithology
Siding (test pits)	Ballast layer: 0-0.3 m	Fill: silty gravel, coarse – cobbles, grey/brown (higher silt content and orange / yellow staining localised within area of lead impact), dry, loose, angular
	Capping layer: 0.3-0.5 m	Fill: clayey gravelly sand, grey/black, moist, coarse, fine sub-angular gravel
	Structural base/subgrade: 0.5-0.7 m	Fill: gravelly clay, grey with brown mottling, moist, stiff, low plasticity
Signalling trench (test pits)	0-0.2 m	Fill: gravelly sand, medium grained, dry, angular coarse-grained gravel with some silt and ballast. Traces of clay, brown
	0.5 m – 0.8 m	Natural: silty sand, clay, low plasticity, brown
	0.8-1 m	Natural sandy clay, low plasticity, pale brown and medium grained sand, coarse gravel, sub angular
Surface soils	0-0.1 m	Variable between sites but generally: Fill: silty sand, gravel, grey, dry, fine to medium, sub-angular

Photographs in **Appendix 2** provide a general depiction of the site and the fill material encountered during the investigation.

4.2 Field Observations

- Siding – the siding area was characterised by old and rusty track works including degraded sleepers and rusty rail works. Fine rust coloured dusts were evident on the underlying ballast. This also appeared to contain fine soil dusts. Discolouration and staining were present in some locations considered potentially indicative of contamination.
- Adjacent areas – areas adjacent to the siding where samples were taken had very limited vegetation. Areas immediately next to the track contained fill material, while other areas had a mixture of natural and fill material on the surface.
- General area – there were a number of drainage channels which were dry. Limited flow was evident in one of the receiving culverts.
- Southern Signalling trench test pits – no visible evidence of contamination was observed within the proposed signal trench alignment south of the Goulburn Street level crossing.
- Ballast in the main line was observed to be less fouled (contains less fines) than in the siding and removal of upper 0.1 – 0.3 m of ballast was required to expose fines.

5. ASSESSMENT CRITERIA

The activity to be undertaken at the site involves mostly outdoor construction work and will include only adult receptors. The most appropriate tier 1 health investigation level (HIL) for lead specified in NEPC (2013) is the HIL D (commercial/industrial) value. The actual exposure scenario presented by this HIL value varies in this site specific exposure, as it considers part of the exposure occurs indoors and a longer time duration on the site. For JHR works, short term outdoor exposure occurs during rail maintenance periods. Nonetheless the HIL D value for tier 1 assessment is considered appropriate as it is the only lead HIL value that considers presence of adult receptors at the work site. Note that other lead HIL values provided in NEPC (2013) assume presence of children as the most sensitive receptor.

The lead ecological investigation level (EIL) provided in NEPC (2013) for commercial industrial land use has been adopted. The actual EIL is calculated by adding the ambient background concentration to the added contaminant limit (above the background). However, the site background was not expected to significantly change the final EIL, therefore the added contaminant limit was conservatively adopted as the EIL value.

The assessment criteria are shown in **Table 6-1**.

XRF values are compared against 80% of the NEPM HIL to account for soil moisture content which is excluded from the XRF concentration determination. XRF determined concentrations are for screening purposes only. The XRF management threshold adopted was 1,200 mg/kg of lead.

6. RESULTS

Tabulated assessment of analytical results against site assessment criteria is presented in **Appendix 4**. A summary of the results is shown in **Table 6.1**, showing concentrations in surface layers only. Exceedances are shown in bold.

Table 6-1: Soil lead results from surface layers.

Location	Sampling site (depth m)	Chainage (km)	Lead Conc. (mg/kg)
			HIL/EIL 1500/1800
Siding (test pits) ballast layer	TP1 0.1-0.5	262.145	4,400
	TP2 0.1-0.4	262.245	3,500
	TP3 0.1-0.5	262.345	29,000
	TP4 0.1-0.3	262.430	38,000
	TP5 0.1-0.45	262.545	3,100
	TP6 0.1-0.4	262.645	6,000
	TP7 0.1-0.4	262.745	3,300
	TP8 0.1-0.3	262.845	2,800
	TP9 0.1-0.3	262.955	600
Signalling trench (test pit)* top layer	TP15 0.1	262.560	27
Surface soils	SS7 0.0-0.1	262.805	4,100
	SS11 0.0-0.1	262.650	2,200
	SS12 0.0-0.1	262.585	32,000
	SS13 0.0-0.1	262.585	2,600
	SS16 0.0-0.1	262.490	15,000
	SS30	262.730	2,100
	SS32	262.070	2,400
	SS37	262.160	1,600
	SS38	262.180	9,900
	SS39	262.230	2,900
	SS40	262.260	2,600
	SS41	262.310	11,000
	SS43	262.430	31,000

	SS45	262.510	4,000
	SS47	262.570	3,900
	SS48	262.630	1,800

*only result for TP15 was available. Surface soils – results exceeding guideline is only shown
HIL D – (health investigation level) and EIL (ecological investigation) level are for commercial/industrial. EIL shown is the added contaminant limit (ACL).

Interpretation of results suggests that:

- Lead contamination at the siding occurs from approximately CH: 261.980 km to CH: 262.880.
- The concentration of lead exceeds both the HIL D and EIL for commercial / industrial. The highest concentration is 38,000 mg/kg which exceeds the HIL D guideline value by about 25 times.
- Highest concentrations occur within the siding between CH: 262.090 km and CH: 262.700 km and is the area of the Tarago Station and the historic ore loading area on the west.
- The lead concentration at TP9 does not exceed the HIL D or EIL value but does appear to be elevated compared to typical background.
- Lead contamination within the signalling trench south of the Goulburn Street level crossing is not present. Lead in shallow soils south of the crossing show concentrations above background (10 mg/kg as in TP15) however, do not exceed HIL D and / or EIL for commercial / industrial. Surface soils adjacent to the siding also appear to have elevated lead, especially at locations closer to where highest concentrations within the siding has been found.

Laboratory reports are presented as **Appendix 5**.

Tabulated assessment of results against waste classification guidelines is presented as part of a stand-alone waste classification report provided as **Appendix 7**.

6.1 XRF

Materials from the mainline are expected to be disturbed as part of the loop extension during excavation and construction of a new turnout and track. Field measurements of lead concentrations within the mainline from CH: 261.900 to CH: 263.000 were completed on 25 to 50 lineal meter increments to assess the degree and extent of lead contamination. Readings were collected from ballast fines approximately 0.1 m below surface.

At each location, one reading (X^1) was collected from between the two rail tracks while one reading (X^2) was collected directly adjacent the west rail track. The average of the two concentrations was then calculated and assessed against a management threshold value of 1,200mg/kg.

The results are tabulated in **Table 6-2** with exceedances of the management threshold value (1,200mg/kg) shown in bold.

Table 6-2: XRF Results - Lead

Chainage	X ¹	X ²	Average (ppm)	Error Estimate
261.930	100	137	120	48 ± 14 ppm
261.950	48	157	100	
261.975	932	1,814	1,380	
262.000	2,746	774	1,760	2,133 ± 81 ppm
262.025	75	2,566	1,320	
262.050	753	849	800*	
262.075	66	517	290*	
262.100	2,133	3,065	2,600	
262.125	1,063	2,104	1,580	
262.150	1,152	654	900*	
262.175	1,043	1,354	1,200*	
262.200	883	1,441	1,160*	
262.225	1,572	1,892	1,730	
262.250	1,515	2,313	1,910	
262.300	2,535	10,200	6,370	
262.350	930	2,064	1,500	
262.400	3,109	4,865	3,990	
262.450	1,870	3,392	2,630	
262.500	4,285	4,467	4,380	6,606 ± 154
262.550	4,839	6,606	5,720	
262.600	2,221	5,898	4,060	
262.650	3,227	2,617	2,920	
262.700	1,691	3,613	2,650	
262.750	1,644	2,269	1,960	
262.800	1,067	2,103	1,590	
262.850	5,354	4,220	4,790	
262.900	1,428	3,169	2,300	
262.950	817	1,028	920	
263.000	97	26	60	

* indicates concentrations that are elevated but fall below the threshold value.

Interpretation of XRF results suggests that:

- Lead contamination within the mainline occurs from approximately CH: 261.950 km to CH: 292.950 km.
- Lead concentrations in the main line appear lower in comparison to concentrations identified in the siding.
- Concentrations of lead in the main line exceed the management threshold value as well as HIL D and / or EIL for commercial / industrial, with the highest concentration being 6,370 ppm (equivalent to 6,370 mg/kg).
- High lead exceedance areas in the mainline generally correspond with high lead exceedances in the rail siding.

6.2 Dust Monitoring

Field measurement of dust impacts associated with construction were collected on 31 August 2019 using a Dust Track II. The weather on the day of sampling was partly cloudy with light winds reaching a maximum of 11 km/h.

The pump was run continuously over a duration of two hours at an upwind and downwind location. Results from dust monitoring is presented in **Table 6-3** and show no significant difference between upwind and downwind locations.

Table 6-3: Dust Monitoring Results

Location	Chainage	Maximum Recording (mg/m ³)	TWA (mg/m ³)
Upwind	262.320	0.004	0.001
Downwind	262.350	0.004	0.002

7. CONCEPTUAL SITE MODEL

A Conceptual Site Model (CSM) is a site-specific qualitative description of the source(s) of contamination, the pathway(s) by which contaminants may migrate through the environmental media, and the populations (human or ecological) that may potentially be exposed. This relationship is commonly known as a Source-Pathway-Receptor (“SPR”) linkage. Where one or more elements of the SPR linkage are missing, the exposure pathway is considered to be incomplete and no further assessment is required. Where this linkage is found to be complete, it does not indicate that health or environmental risk is present, but rather triggers either a more detailed investigation or exposure controls.

Table 7-1: Exposure Pathway Assessment

	Source-Pathway-Receptor Link? (Yes/ No/ Potential (P))				
	Offsite members of the public	Onsite workers	Onsite Ecology	Offsite Ecological Receptors including livestock	Justification
Soil					
Dermal contact with dust/soil	P	Y	Y	NA	Concentrations in soils were found to be above the adopted HIL and EIL criteria. There is the potential for onsite worker exposure if sufficient controls are not put in place. While results infer low contaminant mobility, Tarago Station is close to the high impact lead area (approximately 15m) and potential exists for public users of the station to be exposed to the lead contamination via dust emissions.
Incidental ingestion of dust/soil	P	Y	Y	NA	
Outdoor dust inhalation	P	Y	Y	NA	
Surface Water					
Dermal Contact	N	N	N	P	Flow was not observed in any of the drains or culverts present at the site. However, this might change upon rainfall, which can mobilise contaminated material into the local waterway where aquatic ecological receptors may become exposed.
Incidental Ingestion	N	N	N	P	
Potable Ingestion	N	NA	N	NA	
Irrigation Pathways	N	N	N	N	

Y – Yes, N – No, P – Potential, NA – not applicable

A short-term lead management plan (STLMP) was prepared to guide management of contaminated materials during construction. The STLMP recommends measures for the temporary management of the above risks (during loop expansion works) and is included in **Appendix 6**.

8. REGULATORY CONSIDERATION

8.1 SafeWork NSW

SafeWork NSW requires notification if "lead risk work" is being carried out. Lead risk work is currently defined as work that can cause the following change in blood lead levels:

- a. 10 µg/dL (0.48 µmol/L) for a female of reproductive capacity
- b. 30 µg/dL (1.45 µmol/L) in other cases

SafeWork NSW also suggests notification if the above cannot be clearly determined.

Although it is unlikely that blood lead levels for workers would increase to these levels if the lead management plan is adhered to, it is prudent to notify SafeWork NSW as quantitative determination of the expected change in blood lead levels has not occurred. SafeWork NSW should provide further advice on any blood lead level testing requirements for workers.

8.2 Contaminated Land Management Act

Section 60 of the *Contaminated Land Management Act 1997* outlines the responsibilities and triggers for people whose activities contaminate land, or owners of land that has been contaminated. An evaluation of the duty to report contamination, as outlined in the NSW EPA Guidelines on the Duty to Report, follows.

The Guidelines outline that the following people are to notify the EPA as soon as practical after they become aware of the contamination:

- anyone whose activities have contaminated land, (the polluter)
- an owner of land that has been contaminated (the landowner)

In the above, JHR is neither the polluter, as contamination appears historical, nor the land owner, as land is owned by Transport for NSW. It is therefore recommended that JHR discuss the requirement to report with the land owner.

In terms of the requirement to report the following triggers are to be considered to assess the duty to report:

- 1) *the 95 % upper confidence limit on the arithmetic average concentration of a contaminant in or on soil is equal to or above the Health Investigation Level and/or Health Screening Level for that contaminant for the current or approved use of the respective on-site land, as specified in Section 6, Schedule B1 of the National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPC 2013)*

OR

- 2) *the concentration of a contaminant in an individual soil sample is equal to or more than 250% of the Health Investigation Level and/or Health Screening Level for that contaminant for the current or approved use of the respective on-site land, as specified in Section 6, Schedule B1 of the National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPC 2013)*

AND

- 1) *a person has been or foreseeably will be exposed to the contaminant or a by-product of the contaminant.*

OR

- 2) *the contaminant or a by-product has entered, or will foreseeably enter, neighbouring land, the atmosphere, groundwater or surface water, and is above, or will foreseeably be above, a level of contamination set out in National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPC 2013) or other approved guidelines and will foreseeably continue to remain equal to or above that level.*

Concentrations of lead exceeding assessment criteria as nominated above are considered to exist between CH: 261.950 km to CH: 262.950 km.

The CSM identified the potential for exposure to onsite workers and offsite public receptors. Exposure to the onsite worker is currently controlled through the STLMP (**Appendix 6**). The onsite worker is therefore not considered to be at risk of exposure to the contaminant.

Public users of Tarago Station may have been, or foreseeably could be, exposed to dust contained elevated lead concentrations during use of the Tarago Station. Assessment of lead concentrations in dust at the Tarago Station has not been undertaken and therefore it is uncertain if this exposure pathway is complete.

Contaminants have been identified in onsite surface water above the criteria nominated above (Ramboll 2019).

If contamination in soil extends offsite there is additional potential for historic and future exposure to offsite receptors.

Further assessment of offsite concentrations is recommended to inform consideration of the land owner's duty to notify contamination to the NSW EPA.

8.3 State Environmental Planning Policy 55: Remediation of Land

SEPP 55 defines a framework for management of contamination in NSW. It defines requirements for engagement with consent authorities and local councils according to whether remediation is considered Category 1 (requiring development consent) or Category 2 (requiring notification 30 days before remediation). Notification and consent requirements should be considered further following selection of a remedial strategy.

9. CONCLUSION

Assessment of the proposed signal trench alignment south of the Goulburn Street level crossing adequately informs consideration of the degree and extent of contamination in this area for the purpose of defining associated lead management requirements during construction. Investigations found low concentrations of lead in soils proposed to be excavated and the assessment concluded management requirements specific to contamination are not required in this area.

Assessment of the degree and extent of lead within the proposed Tarago Loop Extension adequately informs consideration of associated risks and management measures for the construction works. Site materials are impacted by lead from CH: 261.950 to 262.950 including fines in ballast in the main and loop lines; ballast at the top of the Woodlawn Siding formation; and soils adjacent (west of) the Woodlawn Siding are impacted by lead (CH: 261.980 km to CH: 262.880 km). A distinct area with much higher lead concentrations was observed between CH: 262.090 km and CH: 262.700 km. Any work undertaken in between these chainages, including this section of signal trench, should be undertaken in accordance with the lead management plan.

Materials from the main and loop lines are expected to be disturbed as part of the loop extension during excavation and construction of a new turnout and track. Field XRF measurements of lead concentrations showed lead exceedance areas in the main and loop lines generally correspond with high lead exceedances in the siding.

Potential exists for contamination to remain within the rail corridor adjacent the site following construction works. This report exclusively considers lead impacted soils to be disturbed as part of the Tarago Loop Extension project.

10. LIMITATIONS

This document is issued in confidence to John Holland Rail for the purposes of assessing contamination associated with the proposed Tarago Loop Extension and associated signal trenching. It should not be used for any other purpose.

The report must not be reproduced in whole or in part except with the prior consent of Ramboll Australia Pty Ltd and subject to inclusion of an acknowledgement of the source. No information as to the contents or subject matter of this document or any part thereof may be communicated in any manner to any third party without the prior consent of Ramboll Australia Pty Ltd.

Whilst reasonable attempts have been made to ensure that the contents of this report are accurate and complete at the time of writing, Ramboll Australia Pty Ltd disclaims any responsibility for loss or damage that may be occasioned directly or indirectly through the use of, or reliance on, the contents of this report.

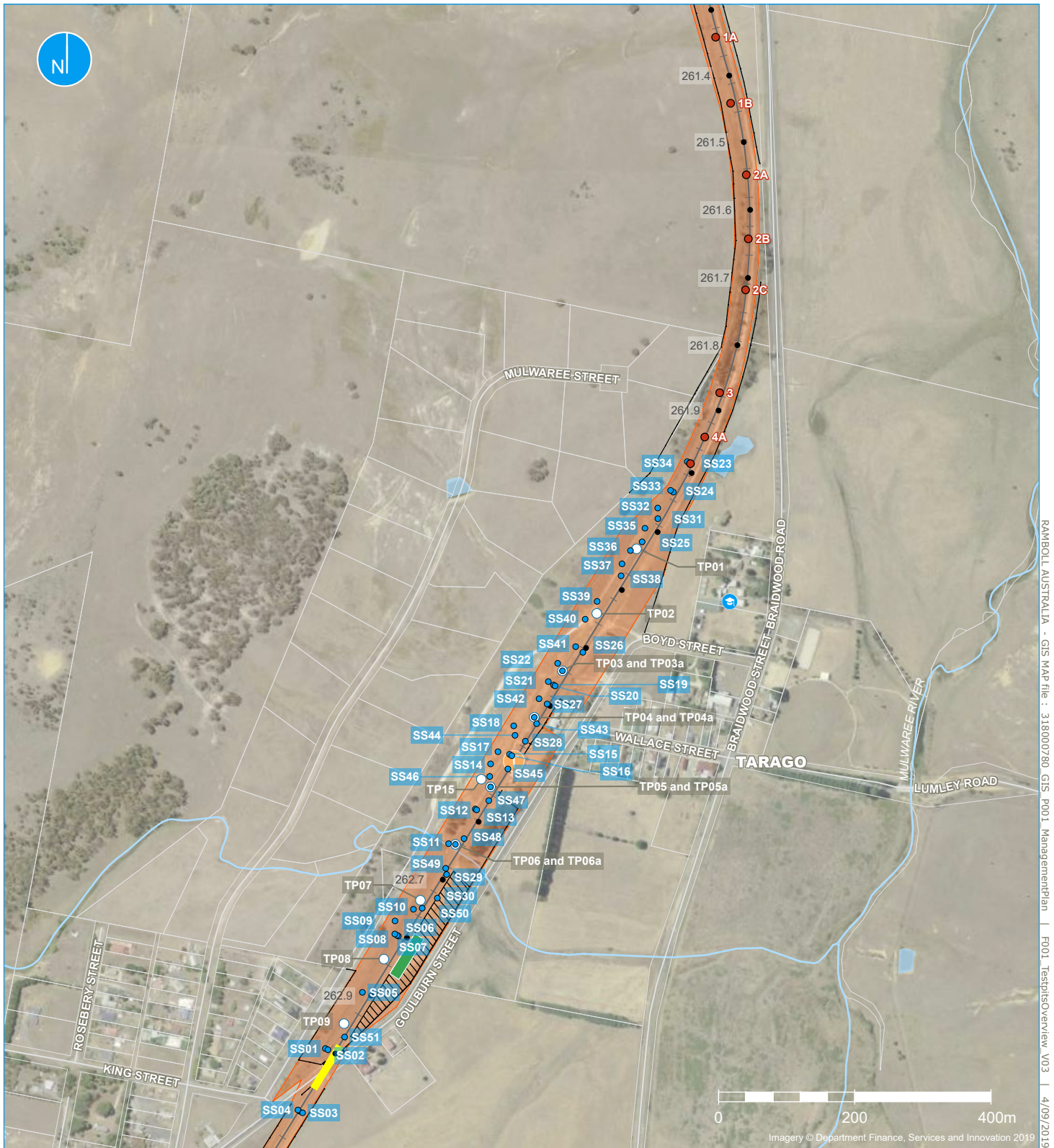
11. REFERENCES

McMahon (2015) *Tarago Rail Siding Extension: Preliminary Contaminated Site Assessment*, June 2015. DM McMahon Pty Ltd, NSW.

NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999*. National Environment Protection Council, May 2013.

Ramboll (2019) *August 2019 Surface Water Monitoring – Tarago Rail Loop Expansion*

APPENDIX 1 FIGURES



RAMBOLL AUSTRALIA - GIS MAP file : 318000780 GIS_P001_ManagementPlan | F001_TestpitsOverview_V03 | 4/09/2019

Legend

- Rail corridor
- Rail corridor fence
- 0.1km chainage point
- Goulburn Street level crossing
- Construction compound
- Goods shed exclusion zone

- Sampling locations (siding works)**
- Shallow soil (Ramboll 2019)
 - Test pit (Ramboll 2019)
 - Previous sample location (McMahon)

A4
1:8,000

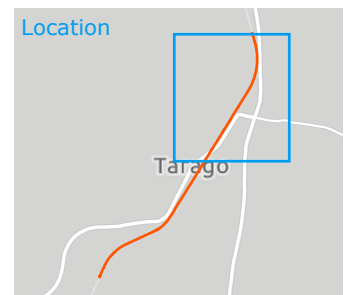


Figure 1 | Overview of siding works sampling locations



Legend

- Rail corridor
- Rail corridor fence
- 0.1km chainage point
- Signal trench (approximate)

- Survey lines**
- Rail track
 - Top of bank
 - Bottom of bank
 - Other elements

- Sampling locations**
- 1200 Lead concentration (mg/kg)
 - Shallow soil (Ramboll 2019)
 - X-Ray fluorescence sampling (Ramboll 2019)
 - Previous sampling location (McMahon)
 - Exceedance location

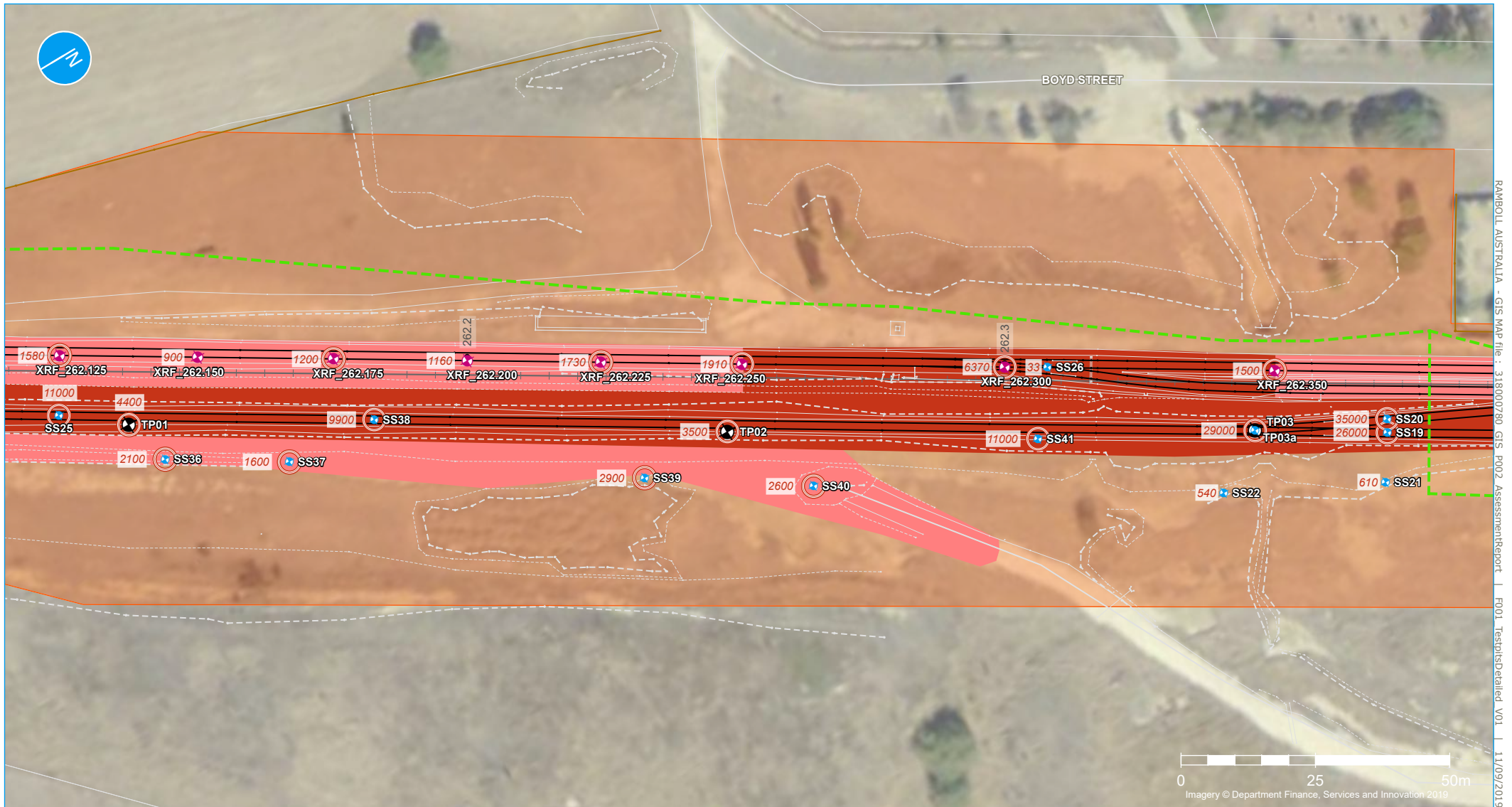
- Exceedance area within construction footprint**
- High (>4000 mg/kg Pb)
 - Medium (1500-4000 mg/kg Pb)

Note: X-Ray fluorescence sampling results were conservatively assessed against a management threshold of 1200 mg/kg Pb to mitigate uncertainty associated with these.

A4
1:1,000



Figure 2a | Assessment of lead in the construction footprint



RAMBOLL AUSTRALIA - GIS MAP file : 3181000780_GIS_P002_AssessmentReport | F001_TestpitsDetailed_V01 | 11/09/2019

Legend

- | | | |
|---|--|---|
| <ul style="list-style-type: none"> Rail corridor Rail corridor fence 0.1km chainage point Signal trench (approximate) | <p>Survey lines</p> <ul style="list-style-type: none"> Rail track Top of bank Bottom of bank Other elements | <p>Sampling locations</p> <ul style="list-style-type: none"> 1200 Lead concentration (mg/kg) Shallow soil (Ramboll 2019) Test pit (Ramboll 2019) X-Ray fluorescence sampling (Ramboll 2019) Exceedance location |
|---|--|---|

- Exceedance area within construction footprint
- High (>4000 mg/kg Pb)
 - Medium (1500-4000 mg/kg Pb)

Note: X-Ray fluorescence sampling results were conservatively assessed against a management threshold of 1200 mg/kg Pb to mitigate uncertainty associated with these.

A4
1:1,000

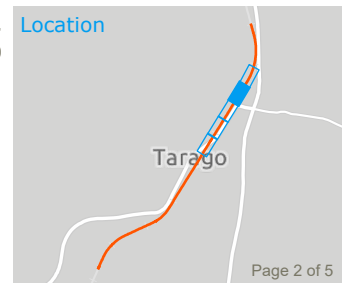
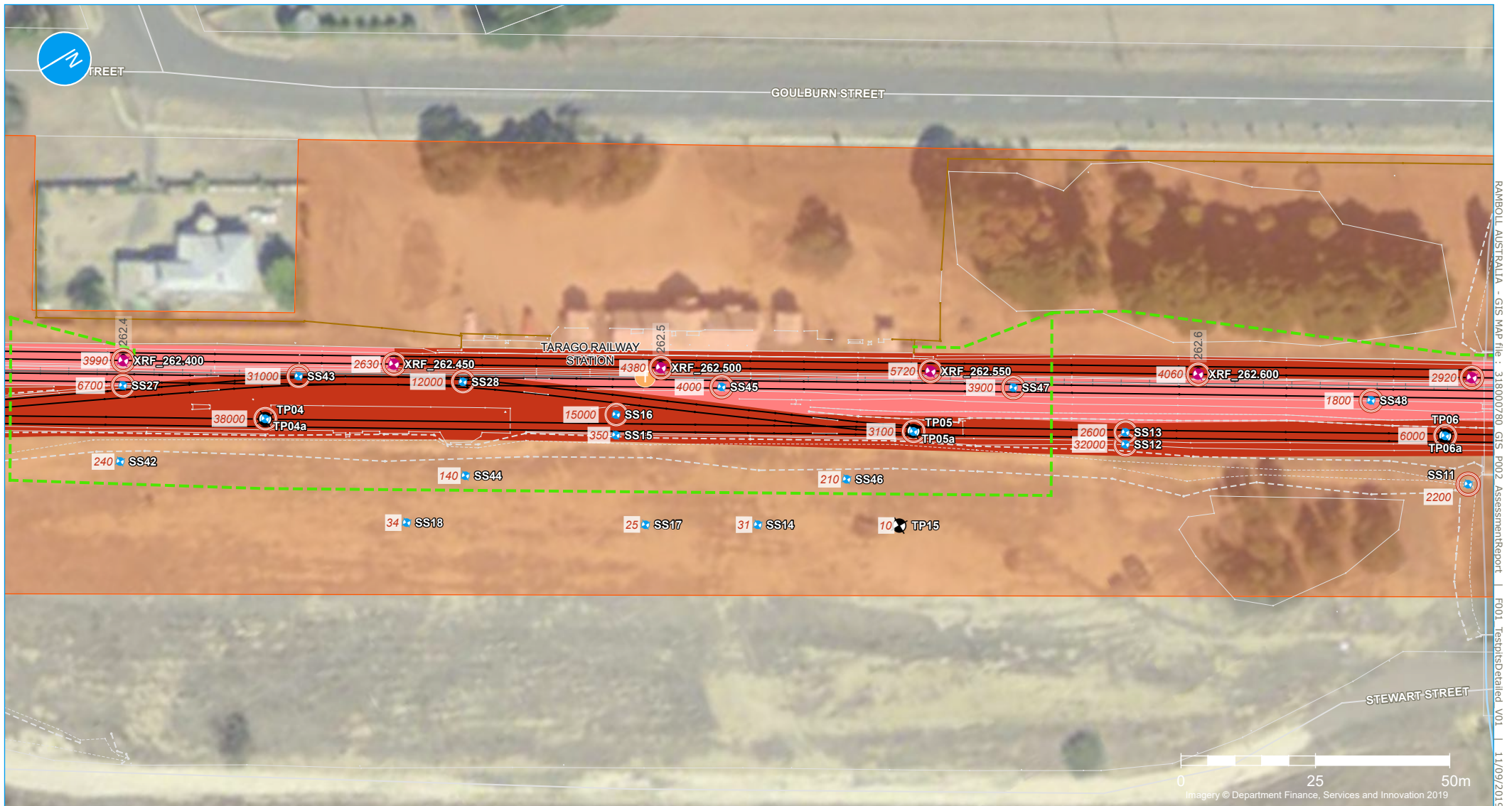


Figure 2b | Assessment of lead in the construction footprint



RAMBOLL AUSTRALIA - GIS MAP file : 318000780 GIS P002 AssessmentReport | F001 TestpitsDetailed_V01 | 11/09/2019

Legend

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> Rail corridor Rail corridor fence 0.1km chainage point Signal trench (approximate) | <p>Survey lines</p> <ul style="list-style-type: none"> Rail track Top of bank Bottom of bank Other elements | <p>Sampling locations</p> <ul style="list-style-type: none"> 1200 Lead concentration (mg/kg) Shallow soil (Ramboll 2019) Test pit (Ramboll 2019) X-Ray fluorescence sampling (Ramboll 2019) Exceedance location |
|--|---|---|

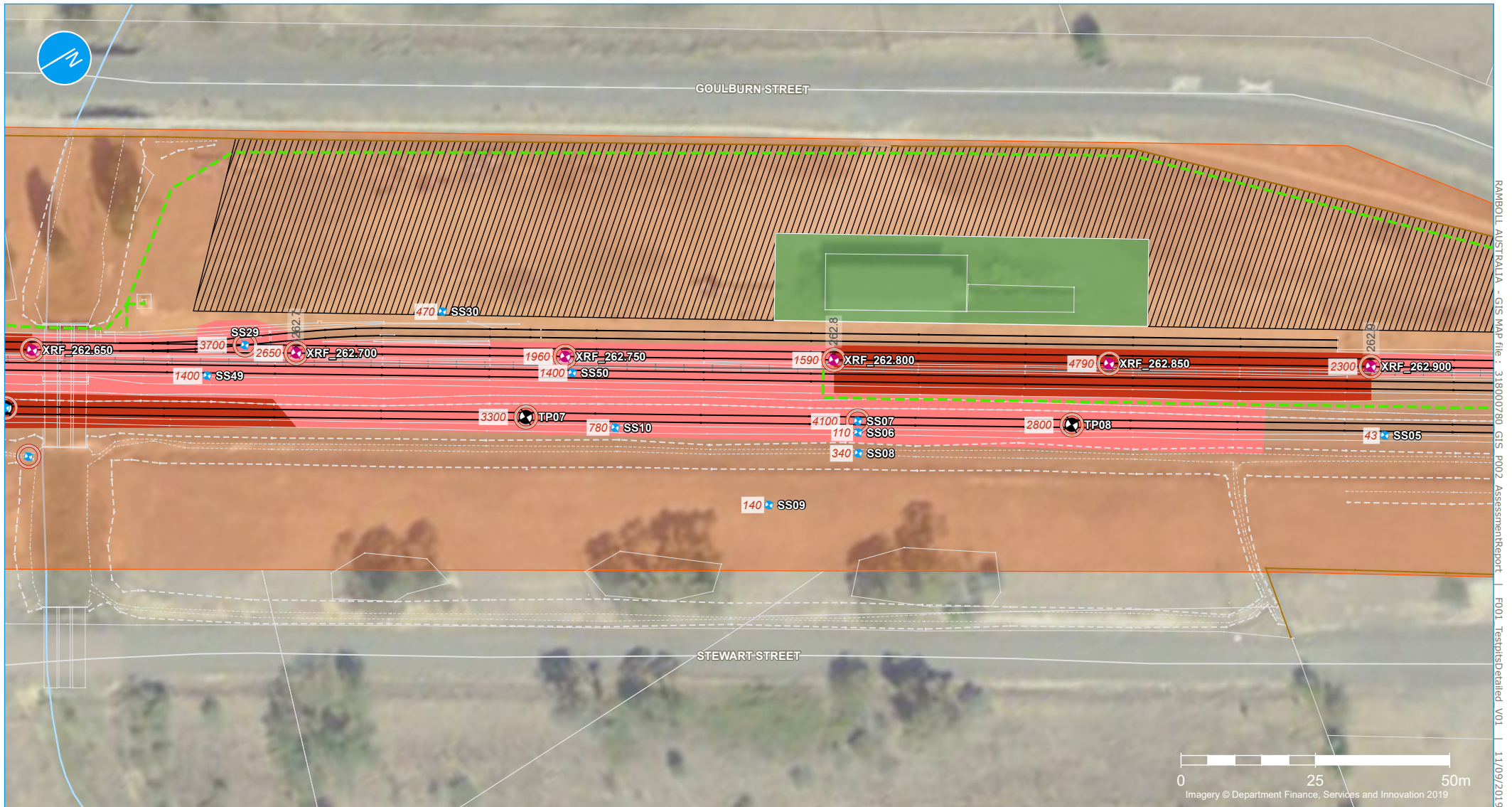
- Exceedance area within construction footprint
- High (>4000 mg/kg Pb)
 - Medium (1500-4000 mg/kg Pb)

Note: X-Ray fluorescence sampling results were conservatively assessed against a management threshold of 1200 mg/kg Pb to mitigate uncertainty associated with these.

A4
1:1,000



Figure 2c | Assessment of lead in the construction footprint



Legend

- | | | |
|-----------------------------|----------------|--|
| Rail corridor | Survey lines | Sampling locations |
| Rail corridor fence | Rail track | 1200 Lead concentration (mg/kg) |
| 0.1km chainage point | Top of bank | Shallow soil (Ramboll 2019) |
| Signal trench (approximate) | Bottom of bank | Test pit (Ramboll 2019) |
| Construction compound | Other elements | X-Ray fluorescence sampling (Ramboll 2019) |
| Goods shed exclusion zone | | Exceedance location |

- Exceedance area within construction footprint
- High (>4000 mg/kg Pb)
 - Medium (1500-4000 mg/kg Pb)

Note: X-Ray fluorescence sampling results were conservatively assessed against a management threshold of 1200 mg/kg Pb to mitigate uncertainty associated with these.

A4
1:1,000

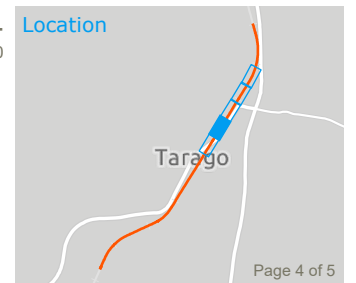
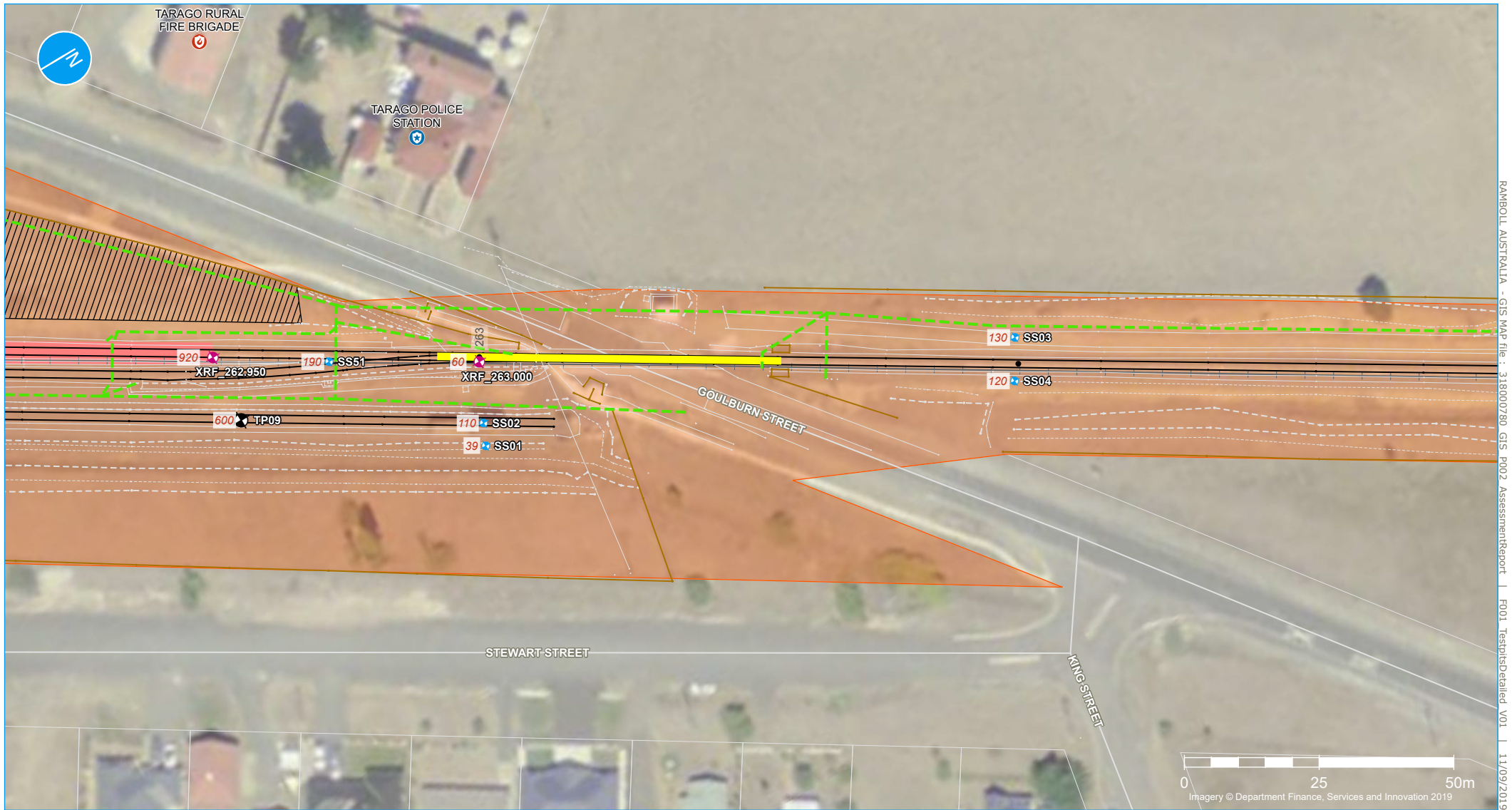


Figure 2d | Assessment of lead in the construction footprint



RAMBOLL AUSTRALIA - GIS MAP file : 318000780 GIS_P002_AssessmentReport | F001_TestpitsDetailed_V01 | 11/09/2019

Legend

- | | | |
|---|--|---|
| <ul style="list-style-type: none"> Rail corridor Rail corridor fence Goulburn Street level crossing Signal trench (approximate) Construction compound | <p>Survey lines</p> <ul style="list-style-type: none"> Rail track Top of bank Bottom of bank Other elements | <p>Sampling locations</p> <ul style="list-style-type: none"> 1200 Lead concentration (mg/kg) Shallow soil (Ramboll 2019) Test pit (Ramboll 2019) X-Ray fluorescence sampling (Ramboll 2019) |
|---|--|---|

Exceedance area within construction footprint

- Medium (1500-4000 mg/kg Pb)

A4
1:1,000



Note: X-Ray fluorescence sampling results were conservatively assessed against a management threshold of 1200 mg/kg Pb to mitigate uncertainty associated with these.

Figure 2e | Assessment of lead in the construction footprint



RAMBOLL AUSTRALIA - GIS MAP file : 318000780 GIS_P001_ManagementPlan | F003_Tespitrs/SignalingWorks_V02 | 10/09/2019

Legend

- Sampling location (signalling works)
- Rail corridor
- Rail corridor fence
- 0.1km chainage point
- Bridge crossing
- Goulburn Street level crossing
- Construction compound
- Goods shed exclusion zone

A4
1:15,000



Figure 3 | Tarago loop extension and signalling works sampling locations

APPENDIX 2 PHOTOGRAPHIC LOG

1. Soil Sample Photos – North of Goulburn St Level Crossing

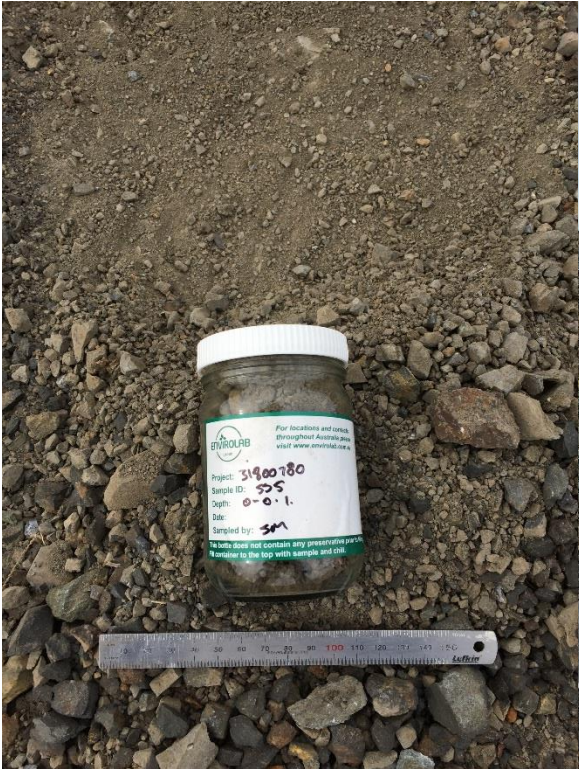


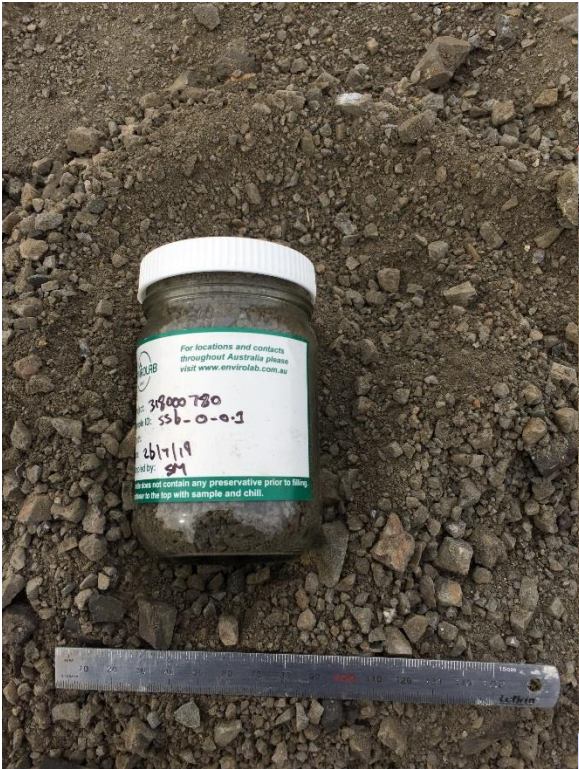


Figures 1.1 to 1.7: Test Pit TP9 samples and relative location looking south to level crossing.

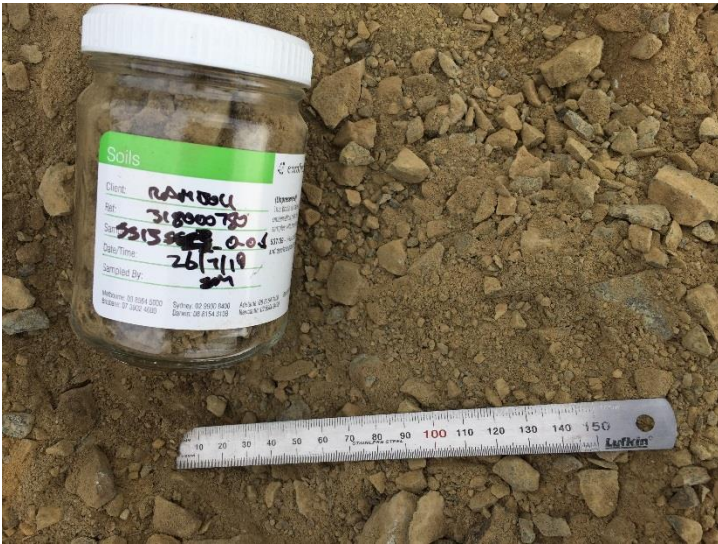


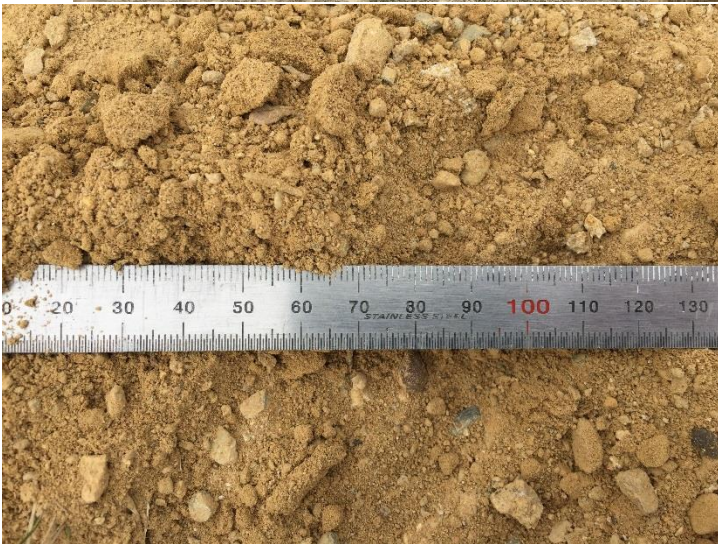






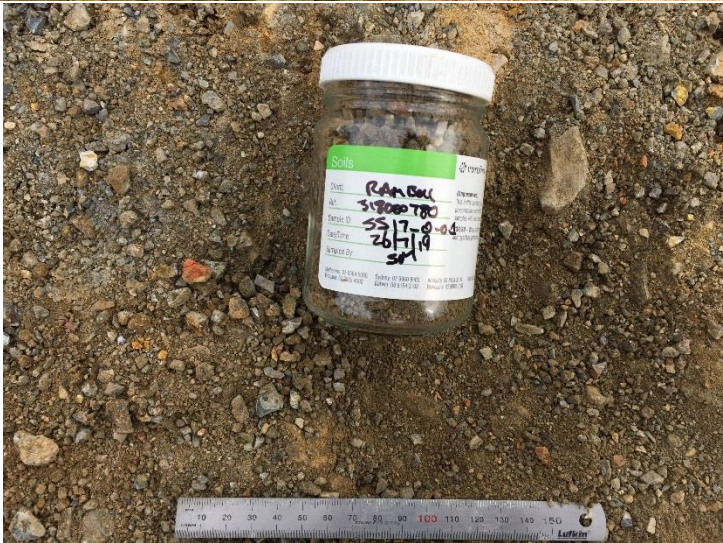


























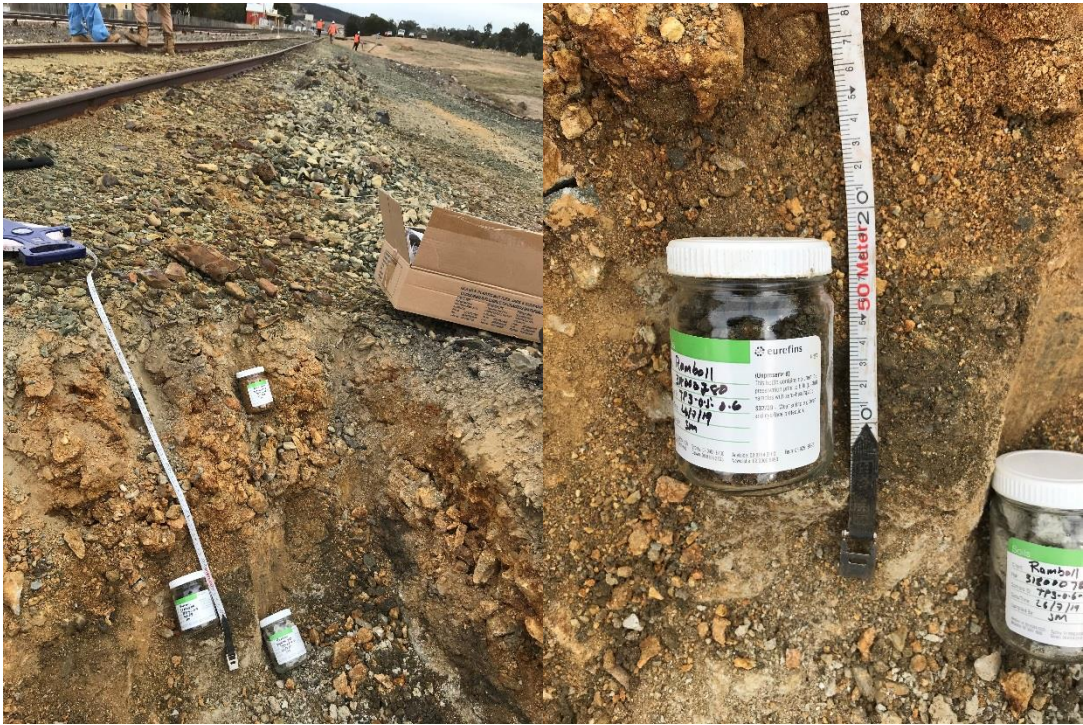












2. Site Photos



Woodlawn Siding showing degraded track work



Woodlawn Siding



Woodlawn Siding showing fouled ballast







Woodlawn Siding: top pictures showing residue left behind from track cutting





Woodlawn Siding north from the crossing

2.1 Culvert Area







Drainage lines next to the culvert







2.2 Tarago Station Area





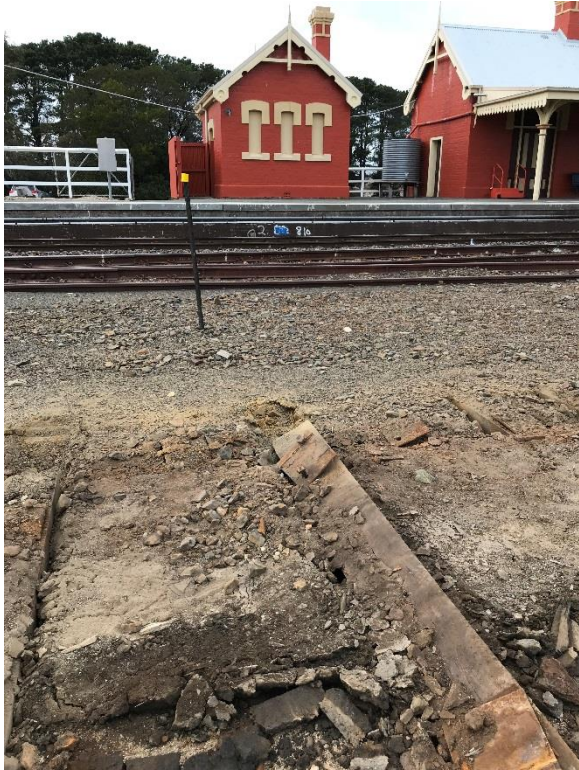




Vegetation in the area west of the Woodlawn Siding









Material from underneath the old trackwork at Woodlawn Siding near the station







Test pit at Woodlawn Siding and adjacent soils







Vegetation west of the Woodlawn Siding



Evidence that the area is accessible by local terrestrial ecology







4. Signal Trench Test Pits – South of Level Crossing

2.1 TP10



Figures 2.1.1 to 2.1.4 – View from testpit along signal trench line (both directions).





Figure 2.1.5 to 2.1.11 – Test pit location, samples and soil profile.

2.2 TP11





Figures 2.2.1 to 2.2.6 – Test pit soil profile and samples.





Figures 2.2.7 to 2.2.10 – Test pit location.

2.3 TP12





Figures 2.3.1 to 2.3.6 – Test pit location



Figures 2.3.7 to 2.3.9 – Soil samples.

2.4 TP13



Figure 2.4.1 – Test pit with identified service in background.



Figures 2.4.2 to 2.4.4 – Test pit location.



Figures 2.4.5 to 2.4.7 – Test pit soil profile and samples.

2.5 TP14





Figures 2.5.1 to 2.5.7 – Test pit location.





Figures 2.5.8 to 2.5.12 – Samples and soil profile

2.6 XRF Sampling



Figures 2.6.1 to 2.6.4 – XRF sampling locations

APPENDIX 3 TEST PIT LOGS



CLIENT John Holland Rail PROJECT NAME Tarago Rail Loop Lead Support
 PROJECT NUMBER 318000780 PROJECT LOCATION Tarago

DATE STARTED 26/7/19 COMPLETED 26/7/19 R.L. SURFACE _____ DATUM _____
 EXCAVATION CONTRACTOR _____ SLOPE --- BEARING ---
 EQUIPMENT _____ TEST PIT LOCATION Woodlawn Siding CH.262145
 TEST PIT SIZE _____ LOGGED BY JB CHECKED BY ST

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
			0.5			FILL; silty gravel, coarse cobbles, grey/brown, dry, loose, angular	TP1_0.1-0.5	
						FILL; clayey gravel, sandy, grey, black, moist, coarse-fine sub angular gravel	TP1_0.5-0.6	
						FILL; gravelly clay, grey with brown mottling, moist, stiff, low plasticity		
			1.0			Borehole TP1 terminated at 0.7m		
			1.5					
			2.0					
			2.5					
			3.0					
			3.5					
			4.0					
			4.5					
			5.0					



CLIENT John Holland Rail PROJECT NAME Tarago Rail Loop Lead Support

PROJECT NUMBER 318000780 PROJECT LOCATION Tarago

DATE STARTED 26/7/19 COMPLETED 26/7/19 R.L. SURFACE _____ DATUM _____

EXCAVATION CONTRACTOR _____ SLOPE --- BEARING ---

EQUIPMENT _____ TEST PIT LOCATION Woodlawn Siding CH.263270

TEST PIT SIZE _____ LOGGED BY JB CHECKED BY ST

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
			0.5			FILL; silty gravel, dry, sub angular cobbles with some silt, with some ballast, trace of clay, brown	TP10_0.2	
			1.0			Gravelly CLAY; stiff, low plasticity, pale brown, coarse grained, sub angular	TP10_0.8-1.0	
			1.5			Borehole TP10 terminated at 1.1m		
			2.0					
			2.5					
			3.0					
			3.5					
			4.0					
			4.5					
			5.0					



CLIENT John Holland Rail PROJECT NAME Tarago Rail Loop Lead Support

PROJECT NUMBER 318000780 PROJECT LOCATION Tarago

DATE STARTED 26/7/19 COMPLETED 26/7/19 R.L. SURFACE _____ DATUM _____

EXCAVATION CONTRACTOR _____ SLOPE --- BEARING ---

EQUIPMENT _____ TEST PIT LOCATION Woodlawn Siding CH.263670

TEST PIT SIZE _____ LOGGED BY JB CHECKED BY ST

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
			0.5			FILL; clayey silty gravel, medium grained, sub angular, high plasticity clay, pale brown, some ballast, dry	TP11_0.1	
			0.5			Sandy CLAY; medium plasticity, reddish brown, coarse sand with some sub angular gravel	TP11_0.5-0.6	
			1.0			Becoming brown at 1.2m	TP11_0.8-1.0	
			1.5			Borehole TP11 terminated at 1m		
			2.0					
			2.5					
			3.0					
			3.5					
			4.0					
			4.5					
			5.0					



CLIENT John Holland Rail PROJECT NAME Tarago Rail Loop Lead Support

PROJECT NUMBER 318000780 PROJECT LOCATION Tarago

DATE STARTED 26/7/19 COMPLETED 26/7/19 R.L. SURFACE _____ DATUM _____

EXCAVATION CONTRACTOR _____ SLOPE --- BEARING ---

EQUIPMENT _____ TEST PIT LOCATION -35.08217, 149.642889

TEST PIT SIZE _____ LOGGED BY JB CHECKED BY ST

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
			0			Silty clayey SAND; fine grained, dry, with some rootlets, trace angular gravel, pale brown	TP12_0.1	
			0.5			Silty sandy CLAY; low plasticity, dry, brown Becoming orangey brown at 0.5m	TP12_0.5	
			1.0			Borehole TP12 terminated at 1m		
			1.5					
			2.0					
			2.5					
			3.0					
			3.5					
			4.0					
			4.5					
			5.0					

BOREHOLE / TEST PIT 318000780 TARAGO RAIL LOOP LEAD SUPPORT.GPJ GINT STD AUSTRALIA.GDT 2/8/19



CLIENT John Holland Rail PROJECT NAME Tarago Rail Loop Lead Support

PROJECT NUMBER 318000780 PROJECT LOCATION Tarago

DATE STARTED 26/7/19 COMPLETED 26/7/19 R.L. SURFACE _____ DATUM _____

EXCAVATION CONTRACTOR _____ SLOPE --- BEARING ---

EQUIPMENT _____ TEST PIT LOCATION -35.084306, 149.630333

TEST PIT SIZE _____ LOGGED BY JB CHECKED BY ST

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
			0.0			grass on surface then Silty clayey SAND; medium grained, dry, pale brown, low plasticity clay lumps	TP13_0.1	
			0.5			Silty sandy CLAY; low plasticity, dry, brown	TP13_0.5-0.6	
			1.0				TP13_0.8-0.9	
			1.5			Borehole TP13 terminated at 1.2m		
			2.0					
			2.5					
			3.0					
			3.5					
			4.0					
			4.5					
			5.0					

BOREHOLE / TEST PIT 318000780 TARAGO RAIL LOOP LEAD SUPPORT.GPJ GINT STD AUSTRALIA.GDT 2/8/19



CLIENT John Holland Rail PROJECT NAME Tarago Rail Loop Lead Support
 PROJECT NUMBER 318000780 PROJECT LOCATION Tarago

DATE STARTED 26/7/19 COMPLETED 26/7/19 R.L. SURFACE _____ DATUM _____
 EXCAVATION CONTRACTOR _____ SLOPE --- BEARING ---
 EQUIPMENT _____ TEST PIT LOCATION -35.085583, 149.636222
 TEST PIT SIZE _____ LOGGED BY JB CHECKED BY ST

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
			0.5			Silty sandy GRAVEL; coarse grained cobbles, pebbles, sub angular, pale brown, dry	TP14_0.1	
			1.0			Clayey sandy GRAVEL; orangey brown, sub rounded and sub angular pebbles and cobbles	TP14_0.6-0.8	
			1.0			Borehole TP14 terminated at 0.8m		
			1.5					
			2.0					
			2.5					
			3.0					
			3.5					
			4.0					
			4.5					
			5.0					



CLIENT John Holland Rail PROJECT NAME Tarago Rail Loop Lead Support

PROJECT NUMBER 318000780 PROJECT LOCATION Tarago

DATE STARTED 26/7/19 COMPLETED 26/7/19 R.L. SURFACE _____ DATUM _____

EXCAVATION CONTRACTOR _____ SLOPE --- BEARING ---

EQUIPMENT _____ TEST PIT LOCATION Woodlawn Siding CH.262530

TEST PIT SIZE _____ LOGGED BY JB CHECKED BY ST

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
			0.5			Silty GRAVEL; coarse cobbles, sub angular, dry, pale brown	TP15_0.1	
			0.8			Silty CLAY; low plasticity, dry, brown	TP15_0.8	
			1.0			Borehole TP15 terminated at 0.8m		
			1.5					
			2.0					
			2.5					
			3.0					
			3.5					
			4.0					
			4.5					
			5.0					



CLIENT John Holland Rail PROJECT NAME Tarago Rail Loop Lead Support

PROJECT NUMBER 318000780 PROJECT LOCATION Tarago

DATE STARTED 26/7/19 COMPLETED 26/7/19 R.L. SURFACE _____ DATUM _____

EXCAVATION CONTRACTOR _____ SLOPE --- BEARING ---

EQUIPMENT _____ TEST PIT LOCATION Woodlawn Siding CH.262245

TEST PIT SIZE _____ LOGGED BY JB CHECKED BY ST

NOTES _____

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
			0.5			FILL; silty gravel, coarse cobbles, grey/brown, dry, loose, angular	TP2_0.1-0.4	
			0.5			FILL; clayey gravel, sandy, grey, black, moist, coarse-fine, sub angular gravel	TP2_0.4-0.5	
			0.5			FILL; gravelly clay, grey with brown mottling, moist, stiff, low plasticity	TP2_0.5-0.7	
			1.0			Borehole TP2 terminated at 0.7m		
			1.5					
			2.0					
			2.5					
			3.0					
			3.5					
			4.0					
			4.5					
			5.0					



CLIENT John Holland Rail PROJECT NAME Tarago Rail Loop Lead Support

PROJECT NUMBER 318000780 PROJECT LOCATION Tarago

DATE STARTED 26/7/19 COMPLETED 26/7/19 R.L. SURFACE _____ DATUM _____

EXCAVATION CONTRACTOR _____ SLOPE --- BEARING ---

EQUIPMENT _____ TEST PIT LOCATION Woodlawn Siding CH.262345

TEST PIT SIZE _____ LOGGED BY JB CHECKED BY ST

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
			0.5			FILL; sandy gravelly silt, orange/brown, dry, loose/soft and recently disturbed, non-plastic	TP3_0.1-0.5	
						FILL; gravelly clay, sandy, grey black, moist, coarse-fine, sub angular	TP3_0.5-0.6	
						FILL; gravelly clay, grey, stiff, low plasticity	TP3_0.6-0.7	
			1.0			Borehole TP3 terminated at 0.7m		
			1.5					
			2.0					
			2.5					
			3.0					
			3.5					
			4.0					
			4.5					
			5.0					

BOREHOLE / TEST PIT 318000780 TARAGO RAIL LOOP LEAD SUPPORT.GPJ GINT STD AUSTRALIA.GDT 2/8/19



CLIENT John Holland Rail PROJECT NAME Tarago Rail Loop Lead Support

PROJECT NUMBER 318000780 PROJECT LOCATION Tarago

DATE STARTED 26/7/19 COMPLETED 26/7/19 R.L. SURFACE _____ DATUM _____

EXCAVATION CONTRACTOR _____ SLOPE --- BEARING ---

EQUIPMENT _____ TEST PIT LOCATION Woodlawn Siding CH.262430

TEST PIT SIZE _____ LOGGED BY JB CHECKED BY ST

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						FILL; silty gravel, coarse cobbles, grey/brown, dry, loose, yellow, sub angular	TP4_0.1-0.3	
						FILL; gravelly clay, grey with brown mottling, moist, stiff, low plasticity	TP4_0.3-0.4	
			0.5			Borehole TP4 terminated at 0.4m		
			1.0					
			1.5					
			2.0					
			2.5					
			3.0					
			3.5					
			4.0					
			4.5					
			5.0					



CLIENT John Holland Rail PROJECT NAME Tarago Rail Loop Lead Support

PROJECT NUMBER 318000780 PROJECT LOCATION Tarago

DATE STARTED 26/7/19 COMPLETED 26/7/19 R.L. SURFACE _____ DATUM _____

EXCAVATION CONTRACTOR _____ SLOPE --- BEARING ---

EQUIPMENT _____ TEST PIT LOCATION Woodlawn Siding CH.262545

TEST PIT SIZE _____ LOGGED BY JB CHECKED BY ST

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
			0.5			FILL; silty gravel, coarse cobbles, grey/brown, dry, loose, angular	TP5_0.1-0.45	
			0.5			FILL; clayey gravel, sandy, grey black, moist, coarse-fine, sub angular gravel	TP5_0.45-0.55, D03_260719, T03_260719	
			0.5			FILL; gravelly clay, grey with brown mottling, moist, stiff, low plasticity	TP5_0.6-0.7	
			0.7			Borehole TP5 terminated at 0.7m		
			1.0					
			1.5					
			2.0					
			2.5					
			3.0					
			3.5					
			4.0					
			4.5					
			5.0					



CLIENT John Holland Rail PROJECT NAME Tarago Rail Loop Lead Support

PROJECT NUMBER 318000780 PROJECT LOCATION Tarago

DATE STARTED 26/7/19 COMPLETED 26/7/19 R.L. SURFACE _____ DATUM _____

EXCAVATION CONTRACTOR _____ SLOPE --- BEARING ---

EQUIPMENT _____ TEST PIT LOCATION Woodlawn Siding CH.262645

TEST PIT SIZE _____ LOGGED BY JB CHECKED BY ST

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
			0.5			FILL; silty gravel, coarse cobbles, grey/brown, dry, loose, angular	TP6_0.1-0.4	
			0.5			FILL; clayey gravel, sandy, grey, black, moist, coarse-fine, sub angular gravel	TP6_0.4-0.5	
			0.5			FILL; gravelly clay, grey with brown mottling, moist, stiff, low plasticity	TP6_0.5-0.7	
			1.0			Borehole TP6 terminated at 0.7m		
			1.5					
			2.0					
			2.5					
			3.0					
			3.5					
			4.0					
			4.5					
			5.0					

BOREHOLE / TEST PIT 318000780 TARAGO RAIL LOOP LEAD SUPPORT.GPJ GINT STD AUSTRALIA.GDT 2/8/19



CLIENT John Holland Rail PROJECT NAME Tarago Rail Loop Lead Support

PROJECT NUMBER 318000780 PROJECT LOCATION Tarago

DATE STARTED 26/7/19 COMPLETED 26/7/19 R.L. SURFACE _____ DATUM _____

EXCAVATION CONTRACTOR _____ SLOPE --- BEARING ---

EQUIPMENT _____ TEST PIT LOCATION Woodlawn Siding CH.262745

TEST PIT SIZE _____ LOGGED BY JB CHECKED BY ST

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
			0.5			FILL; silty gravel, coarse cobbles, grey/brown, dry, loose, angular	TP7_0.1-0.4	
			0.5			FILL; clayey gravel, sandy, grey, black moist, coarse, fine sub angular gravel	TP7_0.4-0.5	
			0.5			FILL; gravelly clay, grey with brown mottling, moist, stiff, low plasticity	TP7_0.5-0.7	
			1.0			Borehole TP7 terminated at 0.7m		
			1.5					
			2.0					
			2.5					
			3.0					
			3.5					
			4.0					
			4.5					
			5.0					



CLIENT John Holland Rail PROJECT NAME Tarago Rail Loop Lead Support

PROJECT NUMBER 318000780 PROJECT LOCATION Tarago

DATE STARTED 26/7/19 COMPLETED 26/7/19 R.L. SURFACE _____ DATUM _____

EXCAVATION CONTRACTOR _____ SLOPE --- BEARING ---

EQUIPMENT _____ TEST PIT LOCATION Woodlawn Siding CH.262845

TEST PIT SIZE _____ LOGGED BY JB CHECKED BY ST

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						FILL; silty gravel, coarse cobbles, grey/brown, dry, loose, angular	TP8_0.1-0.3	
			0.5			FILL; clayey gravel, sand, grey black, moist, coarse, fine sub angular gravel	TP8_0.3-0.5	
						FILL; gravelly clay, grey with brown mottling, moist, stiff, low plasticity	TP8_0.5-0.7	
			1.0			Borehole TP8 terminated at 0.7m		
			1.5					
			2.0					
			2.5					
			3.0					
			3.5					
			4.0					
			4.5					
			5.0					

BOREHOLE / TEST PIT 318000780 TARAGO RAIL LOOP LEAD SUPPORT.GPJ GINT STD AUSTRALIA.GDT 2/8/19



CLIENT John Holland Rail PROJECT NAME Tarago Rail Loop Lead Support

PROJECT NUMBER 318000780 PROJECT LOCATION Tarago

DATE STARTED 26/7/19 COMPLETED 26/7/19 R.L. SURFACE _____ DATUM _____

EXCAVATION CONTRACTOR _____ SLOPE --- BEARING ---

EQUIPMENT _____ TEST PIT LOCATION Woodlawn Siding CH.262955

TEST PIT SIZE _____ LOGGED BY JB CHECKED BY ST

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
						FILL; silty GRAVEL, coarse cobbles, grey/brown, dry, loose, angular	TP9_0.1-0.3	
			0.5			FILL; clayey gravelly SAND, grey/black, moist, coarse, fine, sub angular gravel	TP9_0.3-0.5	
						FILL; gravelly clay, grey with brown mottling, moist, stiff, low plasticity	TP9_0.5-0.7	
			1.0			Borehole TP9 terminated at 0.7m		
			1.5					
			2.0					
			2.5					
			3.0					
			3.5					
			4.0					
			4.5					
			5.0					

APPENDIX 4 RESULTS



		NEPM 2013 HIL D Commercial / Industrial	NEPM 2013 EIL Commercial / Industrial	NEPM 2013 ESCommerci al / Industrial ^B	NEPM 2013 Management Limits Commercial/ Industrial ^C	CRC CARE 2011 Direct Contact ^B HSL D	CRC CARE 2011 Direct Contact ^B HSL for Intrusive Maintenance Workers	CRC CARE 2011 Vapour Intrusion HSL for Intrusive Maintenance Workers Sand 0- <2m ^A	Sample Type:	Soil	Soil	Soil	Soil	Soil	Soil	Soil
								ALS Sample number:	S19-JI39840	S19-JI39841	S19-JI39842	S19-JI39843	S19-JI39844	S19-JI39845	S19-JI39846	S19-JI39846
								Sample date:	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19
								Sample ID:	TP4 0.1-0.3	TP5 0.1-0.45	TP6 0.1-0.4	TP7 0.1-0.4	TP8 0.1-0.3	TP9 0.1-0.3	TP10 0.2	
								Project Name:	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	
								Sampling Method:	Test Pit	Test Pit	Test Pit	Test Pit	Test Pit	Test Pit	Test Pit	
								Sample Description:								
Analyte grouping/Analyte																
								Units	LOR							
EA055: Moisture Content																
Moisture Content (dried @ 103°C)								%	--	3	3.7	2.4	< 1	1.1	21	9.1
EA200: AS 4964 - 2004 Identification of Asbestos in Soils																
Asbestos Detected								g/kg	0.1	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Asbestos Type								--	--	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sample weight (dry)								g	0.1	594	540	65	247	430	259	59
Description								--	--	Brown fine-grained soil and rocks	Brown fine-grained soil and rocks	Brown fine-grained soil and rocks	Brown fine-grained soil and rocks	Brown fine-grained soil and rocks	Brown fine-grained soil and rocks	
EG005T: Total Metals by ICP-AES																
Arsenic		3000	160					mg/kg	5	47	13	11	5.8	23	8.6	6.1
Cadmium		900						mg/kg	1	3.3	1.1	1	0.7	1.6	1	< 0.4
Chromium		3600	310					mg/kg	2	25	7.4	7.6	< 5	11	6.8	< 5
Copper		240000	140					mg/kg	5	990	180	190	62	190	91	< 5
Iron								%	0.005							
Lead		1500	1800					mg/kg	5	8800	1500	1300	510	870	730	18
Nickel		6000	55					mg/kg	2	8.8	< 5	< 5	< 5	5.7	< 5	< 5
Zinc		400000	110					mg/kg	5	940	320	350	130	320	200	17
EG035T: Total Recoverable Mercury by FIMS																
Mercury		730						mg/kg	0.1	0.4	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons																
Naphthalene			370			11000	29000	NL	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene									mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthene									mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene									mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene									mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene									mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene									mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene									mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene									mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene									mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b+j)fluoranthene									mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene									mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene				172					mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3.cd)pyrene									mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene									mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene									mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Sum of polycyclic aromatic hydrocarbons		4000							mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (zero)									mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (half LOR)									mg/kg	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (LOR)		40							mg/kg	1.2	1.2	1.2	1.2	1.2	1.2	1.2
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions																
C6 - C10 Fraction				700	26000	82000		NL	mg/kg	10	< 20	< 20	< 20	< 20	< 20	< 20
C6 - C10 Fraction minus BTEX (F1)			215						mg/kg	10	< 20	< 20	< 20	< 20	< 20	< 20
>C10 - C16 Fraction				1000	20000	62000		NL	mg/kg	50	< 50	< 50	< 50	92	< 50	< 50
>C16 - C34 Fraction (F3)				1700	3500	27000	85000		mg/kg	100	< 100	140	< 100	220	< 100	< 100
>C34 - C40 Fraction (F4)				3300	10000	38000	120000		mg/kg	100	< 100	< 100	< 100	120	< 100	< 100
>C10 - C40 Fraction (sum)									mg/kg	50	< 100	140	< 100	432	< 100	< 100
>C10 - C16 Fraction minus Naphthalene (F2)			170						mg/kg	50	< 50	< 50	< 50	92	< 50	< 50
EP080: BTEXN																



	NEPM 2013 HIL D Commercial / Industrial	NEPM 2013 EIL Commercial / Industrial	NEPM 2013 ESL Commercial / Industrial ^B	NEPM 2013 Management Limits Commercial/Industrial ^C	CRC CARE 2011 Direct Contact ^D HSL	CRC CARE 2011 Direct Contact ^D HSL for Intrusive Maintenance Workers	CRC CARE 2011 Vapour Intrusion HSL for Intrusive Maintenance Workers Sand 0- <2m ^A	Sample Type:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
								ALS Sample number:	S19-JI39840	S19-JI39841	S19-JI39842	S19-JI39843	S19-JI39844	S19-JI39845	S19-JI39846	
								Sample date:	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	
								Sample ID:	TP4 0.1-0.3	TP5 0.1-0.45	TP6 0.1-0.4	TP7 0.1-0.4	TP8 0.1-0.3	TP9 0.1-0.3	TP10 0.2	
								Project Name:	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	
								Sampling Method:	Test Pit	Test Pit	Test Pit	Test Pit	Test Pit	Test Pit	Test Pit	
								Sample Description								
Analyte grouping/Analyte																
								Units	LOR							
Benzene			75		430	1100	77	mg/kg	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Toluene			135		99000	120000	NL	mg/kg	0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Ethylbenzene			165		27000	85000	NL	mg/kg	0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
meta- & para-Xylene								mg/kg	0.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
ortho-Xylene								mg/kg	0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Total Xylenes			95		81000	130000	NL	mg/kg	0.5	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	
Sum of BTEX								mg/kg	0.2							
Naphthalene		370			11000	29000	NL	mg/kg	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	

Blank Cell indicates no criterion available

LOR = Limit of Reporting

National Environment Protection Council (2013) National Environmental Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1) (NEPM).

CRC Care Technical Report no.10, *Health Screening Levels for petroleum hydrocarbons in soil and groundwater* September 2011

^A For soil texture classification undertaken in accord with AS 1726, the classifications of sand, silt and clay may be applied as coarse, fine with liquid limit <50% and fine with liquid limit >50% respectively, as the underlying properties to develop the HSLs may reasonably be selected to be similar. Where there is uncertainty, either a conservative approach may

^B The most conservative ESL guideline value has been adopted for all analytes

^C Management limits are applied after consideration of relevant ESLs and HSLs. Separate management limits for BTEX and naphthalene are not available hence these should not be subtracted from the relevant fractions to obtain F1 and F2.

^D Direct Contact are applied to surface soils or soils that could result in immediate contact.

NL = Non Limiting. No HSL is presented for these chemicals as a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario.

Health Investigation Levels for chromium based on chromium (VI)

Chromium (III) EIL, based on a low clay content (% clay) of 1%

Nickel EIL, based on CEC of 5cmol/kg

Copper EIL, based on CEC of 5cmol/kg

Zinc EIL, based on slightly acidic soil pH of 4.0 and CEC of 5cmol/kg

To obtain F1 subtract the sum of BTEX concentrations from the C6-C10 fraction.

To obtain F2 subtract naphthalene from the >C10-C16 fraction.

Benzo(a)Pyrene ESL derived ecological guideline (95% confidence limits) based on CRC CARE Technical Report no. 39 Risk-based remediation and management guidance for benzo(a)pyrene developed using a species sensitivity distribution (SSD) for eco-toxicity data from five independent studies involving one soil bacteria, three soil invertebrat

Concentration in **red** font and grey box exceed the adopted HIL/HSL 'D' for Commercial/Industrial use

Concentration in **orange** font and grey box exceed the adopted EIL/ESL 'D' for Commercial/Industrial use

Concentrations in box exceed the screening value >2.5

Where one or more guideline value is exceeded, the highest guideline value will be highlighted

Table 1:
 Commercial/Industrial Soil Sampling Results



Sample Type:	Soil	Soil	Soil	Soil	Soil
ALS Sample number:	S19-JI39847	S19-JI39848	S19-JI39849	S19-JI39850	S19-JI39851
Sample date:	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19
Sample ID:	TP11 0.1	TP12 0.1	TP13 0.1	TP14 0.1	TP16 0.1
Project Name:	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop
Sampling Method:	Test Pit	Test Pit	Test Pit	Test Pit	Test Pit
Sample Description					

Analyte grouping/Analyte	Units	LOR														
EA055: Moisture Content																
Moisture Content (dried @ 103°C)	%	--	10	9.4	11	2.3	7.3									
EA200: AS 4964 - 2004 Identification of Asbestos in Soils																
Asbestos Detected	g/kg	0.1	Nil	Nil	Nil	Nil	Nil									
Asbestos Type	--	--	N/A	N/A	N/A	N/A	N/A									
Sample weight (dry)	g	0.1	53	68	51	66	751									
Description	--	--	Brown fine-grained soil and rocks	Brown fine-grained soil and rocks	Brown fine-grained soil and rocks	Brown fine-grained soil and rocks	Brown fine-grained soil and rocks									
EG005T: Total Metals by ICP-AES																
Arsenic	mg/kg	5	6.6	< 2	9.6	< 2	2.1									
Cadmium	mg/kg	1	< 0.4	< 0.4	2.1	< 0.4	< 0.4									
Chromium	mg/kg	2	29	< 5	8.7	< 5	< 5									
Copper	mg/kg	5	9.9	< 5	21	< 5	< 5									
Iron	%	0.005														
Lead	mg/kg	5	43	11	39	6.4	10									
Nickel	mg/kg	2	5.9	< 5	< 5	< 5	< 5									
Zinc	mg/kg	5	81	15	300	14	12									
EG035T: Total Recoverable Mercury by FIMS																
Mercury	mg/kg	0.1	< 0.1	0.3	< 0.1	< 0.1	< 0.1									
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons																
Naphthalene	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5									
Acenaphthylene	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5									
Acenaphthene	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5									
Fluorene	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5									
Phenanthrene	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5									
Anthracene	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5									
Fluoranthene	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5									
Pyrene	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5									
Benz(a)anthracene	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5									
Chrysene	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5									
Benzo(b+j)fluoranthene	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5									
Benzo(k)fluoranthene	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5									
Benzo(a)pyrene	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5									
Indeno(1,2,3.cd)pyrene	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5									
Dibenz(a,h)anthracene	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5									
Benzo(g,h,i)perylene	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5									
Sum of polycyclic aromatic hydrocarbons	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5									
Benzo(a)pyrene TEQ (zero)	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5									
Benzo(a)pyrene TEQ (half LOR)	mg/kg	0.6	0.6	0.6	0.6	0.6	0.6									
Benzo(a)pyrene TEQ (LOR)	mg/kg	1.2	1.2	1.2	1.2	1.2	1.2									
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions																
C6 - C10 Fraction	mg/kg	10	< 20	< 20	< 20	< 20	< 20									
C6 - C10 Fraction minus BTEX (F1)	mg/kg	10	< 20	< 20	< 20	< 20	< 20									
>C10 - C16 Fraction	mg/kg	50	< 50	< 50	< 50	< 50	< 50									
>C16 - C34 Fraction (F3)	mg/kg	100	< 100	< 100	< 100	150	< 100									
>C34 - C40 Fraction (F4)	mg/kg	100	< 100	< 100	< 100	< 100	< 100									
>C10 - C40 Fraction (sum)	mg/kg	50	< 100	< 100	< 100	150	< 100									
>C10 - C16 Fraction minus Naphthalene (F2)	mg/kg	50	< 50	< 50	< 50	< 50	< 50									
EP080: BTEXN																

								Sample Type:	Soil	Soil	Soil	Soil	Soil
								ALS Sample number:	S19-JI39847	S19-JI39848	S19-JI39849	S19-JI39850	S19-JI39851
								Sample date:	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19
								Sample ID:	TP11 0.1	TP12 0.1	TP13 0.1	TP14 0.1	TP16 0.1
								Project Name:	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop
								Sampling Method:	Test Pit	Test Pit	Test Pit	Test Pit	Test Pit
								Sample Description					

Analyte grouping/Analyte								Units	LOR					
Benzene			75		430	1100	77	mg/kg	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Toluene			135		99000	120000	NL	mg/kg	0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene			165		27000	85000	NL	mg/kg	0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
meta- & para-Xylene								mg/kg	0.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
ortho-Xylene								mg/kg	0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Xylenes			95		81000	130000	NL	mg/kg	0.5	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Sum of BTEX								mg/kg	0.2					
Naphthalene		370			11000	29000	NL	mg/kg	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Blank Cell indicates no criterion available

LOR = Limit of Reporting

National Environment Protection Council (2013) National Environmental Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1) (NEPM).

CRC Care Technical Report no.10, *Health Screening Levels for petroleum hydrocarbons in soil and groundwater* September 2011

^A For soil texture classification undertaken in accord with AS 1726, the classifications of sand, silt and clay may be applied as coarse, fine with liquid limit <50% and fine with liquid limit >50% respectively, as the underlying properties to develop the HSLs may reasonably be selected to be similar. Where there is uncertainty, either a conservative approach may

^B The most conservative ESL guideline value has been adopted for all analytes

^C Management limits are applied after consideration of relevant ESLs and HSLs. Separate management limits for BTEX and naphthalene are not available hence these should not be

^D Direct Contact are applied to surface soils or soils that could result in immediate contact.

NL = Non Limiting. No HSL is presented for these chemicals as a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum

Health Investigation Levels for chromium based on chromium (VI)

Chromium (III) EIL, based on a low clay content (% clay) of 1%

Nickel EIL, based on CEC of 5cmol/kg

Copper EIL, based on CEC of 5cmol/kg

Zinc EIL, based on slightly acidic soil pH of 4.0 and CEC of 5cmol/kg

To obtain F1 subtract the sum of BTEX concentrations from the C6-C10 fraction.

To obtain F2 subtract naphthalene from the >C10-C16 fraction.

Benzo(a)Pyrene ESL derived ecological guideline (95% confidence limits) based on CRC CARE Technical Report no. 39 Risk-based remediation and management guidance for benzo(e) taxa and four plant taxa (13 endpoints) in preference to NEPM low reliability data.

Concentration in **red** font and grey box exceed the adopted HIL/HSL 'D' for Commercial/Industrial use

Concentration in **orange** font and grey box exceed the adopted EIL/ESL 'D' for Commercial/Industrial use

Concentrations in box exceed the screening value >2.5

Where one or more guideline value is exceeded, the highest guideline value will be highlighted



Analyte grouping / Analyte	Units		LOR									
EG005T: Total Metals by ICP-AES												
Lead	1,500	1,800	mg/kg	5	4,400	10	3,500	110	16	29,000	74	

Blank Cell indicates no criterion available
 LOR = Limit of Reporting
 National Environment Protection Council (2013)
 National Environmental Protection (Assessment of
 Concentration in **red** font and grey
 box exceed the adopted HIL/HSL 'D'
 for Commercial/Industrial use

Concentration in **orange** font and
 grey box exceed the adopted
 EIL/ESL 'D' for
 Commercial/Industrial use

Concentrations in box exceed the screening value > 2
 Concentrations below the LOR noted as <value
 * indicates higher duplicate value adopted



	NEPM 2013 HIL D Commercial / Industrial	NEPM 2013 EIL Commercial / Industrial	Sample Type:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
			Laboratory Sample number	S19-JI39898	S19-JI39899	S19-JI39900	S19-JI39901	S19-JI39902	S19-JI39903	S19-JI39904	
			Sample date:	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	
			Sample ID:	TP3 0.6-0.7	TP4 0.1-0.3	TP4 0.3-0.4	TP5 0.1-0.45	TP5 0.45-0.55	TP5 0.6-0.7	TP6 0.1-0.4	
			Site:	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	
			Sampling Method:	Test pit	Test pit	Test pit	Test pit	Test pit	Test pit	Test pit	
Analyte grouping / Analyte			Units	LOR							
EG005T: Total Metals by ICP-AES											
Lead	1,500	1,800	mg/kg	5	13	38,000	70	3,100	150	47	6,000

Blank Cell indicates no criterion available

LOR = Limit of Reporting

National Environment Protection Council (2013)

National Environmental Protection (Assessment of

Concentration in **red** font and grey box exceed the adopted HIL/HSL 'D' for Commercial/Industrial use

Concentration in **orange** font and grey box exceed the adopted EIL/ESL 'D' for Commercial/Industrial use

Concentrations in box exceed the screening value >2

Concentrations below the LOR noted as <value

* indicates higher duplicate value adopted



	NEPM 2013 HIL D Commercial / Industrial	NEPM 2013 EIL Commercial / Industrial	Sample Type:	Soil	Soil	Soil	Soil	Soil	Soil	Soil
			Laboratory Sample number	S19-JI39905	S19-JI39906	S19-JI39907	S19-JI39908	S19-JI39909	S19-JI39910	S19-JI39911
			Sample date:	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19
			Sample ID:	TP6 0.4-0.5	TP6 0.5-0.7	TP7 0.1-0.4	TP7 0.4-0.5	TP7 0.5-0.7	TP8 0.1-0.3	TP8 0.3-0.5
			Site:	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop
			Sampling Method:	Test pit	Test pit	Test pit	Test pit	Test pit	Test pit	Test pit
Analyte grouping /Analyte										
Units										
LOR										
EG005T: Total Metals by ICP-AES										
Lead	1,500	1,800	mg/kg	5	20	7	3,300	76	7	2,800

Blank Cell indicates no criterion available

LOR = Limit of Reporting

National Environment Protection Council (2013)

National Environmental Protection (Assessment of

Concentration in **red** font and grey box exceed the adopted HIL/HSL 'D' for Commercial/Industrial use

Concentration in **orange** font and grey box exceed the adopted EIL/ESL 'D' for Commercial/Industrial use

Concentrations in box exceed the screening value >2

Concentrations below the LOR noted as <value

* indicates higher duplicate value adopted



	NEPM 2013 HIL D Commercial / Industrial	NEPM 2013 EIL Commercial / Industrial	Sample Type:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
			Laboratory Sample number	S19-JI39912	S19-JI39913	S19-JI39914	S19-JI39915	S19-JI39918	S19-JI39919	S19-JI39920	
			Sample date:	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	
			Sample ID:	TP8 0.5-0.8	TP9 0.1-0.3	TP9 0.3-0.5	TP9 0.5-0.7	TP15 0.1	TP15 0.8	SS1 0.0-0.1	
			Site:	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	
			Sampling Method:	Test pit	Test pit	Test pit	Test pit	Test pit	Test pit	Test pit	
Analyte grouping / Analyte			Units	LOR							
EG005T: Total Metals by ICP-AES											
Lead	1,500	1,800	mg/kg	5	22	600	< 5	8	27	26	39

Blank Cell indicates no criterion available
 LOR = Limit of Reporting
 National Environment Protection Council (2013)
 National Environmental Protection (Assessment of
 Concentration in **red** font and grey
 box exceed the adopted HIL/HSL 'D'
 for Commercial/Industrial use

Concentration in **orange** font and
 grey box exceed the adopted
 EIL/ESL 'D' for
 Commercial/Industrial use

Concentrations in box exceed the screening value > 2
 Concentrations below the LOR noted as <value
 * indicates higher duplicate value adopted



	NEPM 2013 HIL D Commercial / Industrial	NEPM 2013 EIL Commercial / Industrial	Sample Type:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
			Laboratory Sample number	S19-JI39921	S19-JI39922	S19-JI39923	S19-JI39924	S19-JI39925	S19-JI39926	S19-JI39927	
			Sample date:	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	
			Sample ID:	SS2 0.0-0.1	SS3 0.0-0.1	SS4 0.0-0.1	SS5 0.0-0.1	SS6 0.0-0.1	SS7 0.0-0.1	SS8 0.0-0.1	
			Site:	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	
			Sampling Method:	Test pit	Test pit	Test pit	Test pit	Test pit	Test pit	Test pit	
Analyte grouping / Analyte			Units	LOR							
EG005T: Total Metals by ICP-AES											
Lead	1,500	1,800	mg/kg	5	110	130	120	43	110	4,100	340

Blank Cell indicates no criterion available

LOR = Limit of Reporting

National Environment Protection Council (2013)

National Environmental Protection (Assessment of

Concentration in **red** font and grey box exceed the adopted HIL/HSL 'D' for Commercial/Industrial use

Concentration in **orange** font and grey box exceed the adopted EIL/ESL 'D' for Commercial/Industrial use

Concentrations in box exceed the screening value >2

Concentrations below the LOR noted as <value

* indicates higher duplicate value adopted



	NEPM 2013 HIL D Commercial / Industrial	NEPM 2013 EIL Commercial / Industrial	Sample Type:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
			Laboratory Sample number	S19-JI39928	S19-JI39929	S19-JI39930	S19-JI39931	S19-JI39932	S19-JI39933	S19-JI39934	
			Sample date:	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	
			Sample ID:	SS9 0.0-0.1	SS10 0.0-0.1	SS11 0.0-0.1	SS12 0.0-0.1	SS13 0.0-0.1	SS14 0.0-0.1	SS15 0.0-0.1	
			Site:	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	
			Sampling Method:	Test pit	Test pit	Test pit	Test pit	Test pit	Test pit	Test pit	
Analyte grouping / Analyte			Units	LOR							
EG005T: Total Metals by ICP-AES											
Lead	1,500	1,800	mg/kg	5	140	780	2,200	32,000	2,600	31	350

Blank Cell indicates no criterion available

LOR = Limit of Reporting

National Environment Protection Council (2013)

National Environmental Protection (Assessment of

Concentration in **red** font and grey box exceed the adopted HIL/HSL 'D' for Commercial/Industrial use

Concentration in **orange** font and grey box exceed the adopted EIL/ESL 'D' for Commercial/Industrial use

Concentrations in box exceed the screening value >2

Concentrations below the LOR noted as <value

* indicates higher duplicate value adopted



Analyte grouping / Analyte	Units	LOR									
EG005T: Total Metals by ICP-AES											
Lead	1,500	1,800	mg/kg	5	15,000	25	34	26,000	35,000	610	540

Blank Cell indicates no criterion available
 LOR = Limit of Reporting
 National Environment Protection Council (2013)
 National Environmental Protection (Assessment of
 Concentration in **red** font and grey
 box exceed the adopted HIL/HSL 'D'
 for Commercial/Industrial use

Concentration in **orange** font and
 grey box exceed the adopted
 EIL/ESL 'D' for
 Commercial/Industrial use

Concentrations in box exceed the screening value > 2
 Concentrations below the LOR noted as <value
 * indicates higher duplicate value adopted



	NEPM 2013 HIL D Commercial / Industrial	NEPM 2013 EIL Commercial / Industrial	Sample Type:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
			Laboratory Sample number	S19-Au17274	S19-Au17275	S19-Au17276	S19-Au17277	S19-Au17278	S19-Au17279	S19-Au17280	
			Sample date:	12-08-19	12-08-19	12-08-19	12-08-19	12-08-19	12-08-19	12-08-19	
			Sample ID:	SS23	SS24	SS25	SS26	SS27	SS28	SS29	
			Site:	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	
			Sampling Method:	Shallow Soil	Shallow Soil	Shallow Soil	Shallow Soil	Shallow Soil	Shallow Soil	Shallow Soil	
Analyte grouping / Analyte			Units	LOR							
EG005T: Total Metals by ICP-AES											
Lead	1,500	1,800	mg/kg	5	350	3,000	11,000	33	6,700	12,000	3,700

Blank Cell indicates no criterion available

LOR = Limit of Reporting

National Environment Protection Council (2013)

National Environmental Protection (Assessment of

Concentration in **red** font and grey box exceed the adopted HIL/HSL 'D' for Commercial/Industrial use

Concentration in **orange** font and grey box exceed the adopted EIL/ESL 'D' for Commercial/Industrial use

Concentrations in box exceed the screening value >2

Concentrations below the LOR noted as <value

* indicates higher duplicate value adopted



	NEPM 2013 HIL D Commercial / Industrial	NEPM 2013 EIL Commercial / Industrial	Sample Type:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
			Laboratory Sample number	S19-Au17281	S19-Au39076	S19-Au39077	S19-Au39078	S19-Au39079	S19-Au39080	S19-Au39075	
			Sample date:	12-08-19	27-08-19	27-08-19	27-08-19	27-08-19	27-08-19	27-08-19	
			Sample ID:	SS30	SS31	SS32	SS33	SS34	SS35	SS36	
			Site:	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	
			Sampling Method:	Shallow Soil	Shallow Soil	Shallow Soil	Shallow Soil	Shallow Soil	Shallow Soil	Shallow Soil	
Analyte grouping /Analyte			Units	LOR							
EG005T: Total Metals by ICP-AES											
Lead	1,500	1,800	mg/kg	5	470	710	2800*	800	850	900	2,100

Blank Cell indicates no criterion available

LOR = Limit of Reporting

National Environment Protection Council (2013)

National Environmental Protection (Assessment of

Concentration in **red** font and grey box exceed the adopted HIL/HSL 'D' for Commercial/Industrial use

Concentration in **orange** font and grey box exceed the adopted EIL/ESL 'D' for Commercial/Industrial use

Concentrations in box exceed the screening value >2

Concentrations below the LOR noted as <value

* indicates higher duplicate value adopted



	NEPM 2013 HIL D Commercial / Industrial	NEPM 2013 EIL Commercial / Industrial	Sample Type:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
			Laboratory Sample number	S19-Au39082	S19-Au39083	S19-Au39084	S19-Au39085	S19-Au39086	S19-Au39087	S19-Au39088	
			Sample date:	27-08-19	27-08-19	27-08-19	27-08-19	27-08-19	27-08-19	27-08-19	
			Sample ID:	SS37	SS38	SS39	SS40	SS41	SS42	SS43	
			Site:	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	
			Sampling Method:	Shallow Soil	Shallow Soil	Shallow Soil	Shallow Soil	Shallow Soil	Shallow Soil	Shallow Soil	
Analyte grouping / Analyte			Units	LOR							
EG005T: Total Metals by ICP-AES											
Lead	1,500	1,800	mg/kg	5	1,600	9,900	2,900	2,600	11,000	240	31,000

Blank Cell indicates no criterion available

LOR = Limit of Reporting

National Environment Protection Council (2013)

National Environmental Protection (Assessment of

Concentration in **red** font and grey box exceed the adopted HIL/HSL 'D' for Commercial/Industrial use

Concentration in **orange** font and grey box exceed the adopted EIL/ESL 'D' for Commercial/Industrial use

Concentrations in box exceed the screening value >2

Concentrations below the LOR noted as <value

* indicates higher duplicate value adopted



			Sample Type:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
	NEPM 2013 HIL D Commercial / Industrial	NEPM 2013 EIL Commercial / Industrial	Laboratory Sample number	S19-Au39089	S19-Au39090	S19-Au39091	S19-Au39092	S19-Au39093	S19-Au39094	S19-Au39095	
Sample date:			27-08-19	27-08-19	27-08-19	27-08-19	27-08-19	27-08-19	27-08-19		
Sample ID:			SS44	SS45	SS46	SS47	SS48	SS49	SS50		
Site:			Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop		
Sampling Method:			Shallow Soil	Shallow Soil	Shallow Soil	Shallow Soil	Shallow Soil	Shallow Soil	Shallow Soil		
Analyte grouping /Analyte			Units	LOR							
EG005T: Total Metals by ICP-AES											
Lead	1,500	1,800	mg/kg	5	140	4,000	210	3,900	1,800	1,400	1,400

Blank Cell indicates no criterion available
 LOR = Limit of Reporting
 National Environment Protection Council (2013)
 National Environmental Protection (Assessment of
 Concentration in **red** font and grey
 box exceed the adopted HIL/HSL 'D'
 for Commercial/Industrial use

Concentration in **orange** font and
 grey box exceed the adopted
 EIL/ESL 'D' for
 Commercial/Industrial use

Concentrations in box exceed the screening value >2
 Concentrations below the LOR noted as <value
 * indicates higher duplicate value adopted



Analyte grouping / Analyte	Units	LOR
EG005T: Total Metals by ICP-AES		
Lead	1,500	1,800

Blank Cell indicates no criterion available
 LOR = Limit of Reporting
 National Environment Protection Council (2013)
 National Environmental Protection (Assessment of
 Concentration in **red** font and grey
 box exceed the adopted HIL/HSL 'D'
 for Commercial/Industrial use

Concentration in **orange** font and
 grey box exceed the adopted
 EIL/ESL 'D' for
 Commercial/Industrial use

Concentrations in box exceed the screening value > 2
 Concentrations below the LOR noted as <value
 * indicates higher duplicate value adopted

	Laboratory Sample number:	S19-JI39901	S19-JI39937	RPD (%)	S19-JI39901	222573-2	RPD (%)	
	Sample date:	26/07/19	26/07/19		26/07/19	26/07/19		
	Sample ID:	TP5 0.1-0.45	D03_260719		TP5 0.1-0.45	T03_260719		
	Project Name:	Tarago Rail Loop lead Management	Tarago Rail Loop lead Management		Tarago Rail Loop lead Management	Tarago Rail Loop lead Management		
	Site Area:							
	Sample Type:	Soil Jar	Soil Jar		Soil Jar	Soil Jar		
	Sample Description							
Total Metals by ICP-AES								
Lead	mg/kg	5	150	120	22.2	150	24	144.8

LOR = Limit of Reporting

<value = Less than the laboratory Limit of Reporting (LOR)

Bold and Shaded cells exceed RPD >30%

Bold indicates when above the acceptance criteria for Trip Spikes/Blanks and Rinsates

nc = not calculated as one or more results are below the LOR.

	Laboratory Sample number	S19-JI39913	S19-JI39936	RPD (%)	S19-JI39913	222573-1	RPD (%)	
	Sample date:	26/07/19	26/07/19		26/07/19	26/07/19		
	Sample ID:	TP9 0.1-0.3	D02_260719		TP9 0.1-0.3	T02_260719		
	Project Name:	Tarago Rail Loop lead Management	Tarago Rail Loop lead Management		Tarago Rail Loop lead Management	Tarago Rail Loop lead Management		
	Site Area:							
	Sample Type:	Soil Jar	Soil Jar		Soil Jar	Soil Jar		
	Sample Description							
Total Metals by ICP-AES								
Lead	mg/kg	5	600	280	72.7	600	260	79.1

LOR = Limit of Reporting

<value = Less than the laboratory Limit of Reporting (LOR)

Bold and Shaded cells exceed RPD >30%

Bold indicates when above the acceptance criteria for Trip Spikes/Blanks

nc = not calculated as one or more results are below the LOR.

	Laboratory Sample number	S19-Au17279	S19-Au17282	RPD (%)	S19-Au17279	ES1925785001	RPD (%)	
	Sample date:	12-08-19	12-08-19		12-08-19	12-08-19		
	Sample ID:	SS28	D01_120819		SS28	T01_120819		
	Project Name:	Tarago Rail Loop lead Management	Tarago Rail Loop lead Management		Tarago Rail Loop lead Management	Tarago Rail Loop lead Management		
	Site Area:							
	Sample Type:	Soil Jar	Soil Jar		Soil Jar	Soil Jar		
	Sample Description							
Total Metals by ICP-AES								
Lead	mg/kg	5	12000	13000	8	12000	15000	22

LOR = Limit of Reporting

<value = Less than the laboratory Limit of Reporting (LOR)

Bold and Shaded cells exceed RPD >30%

Bold indicates when above the acceptance criteria for Trip Spikes/Blanks

nc = not calculated as one or more results are below the LOR.

	Laboratory Sample number	S19-Au17281	S19-Au17283	RPD (%)	S19-Au17281	ES1925785002	RPD (%)	
	Sample date:	12-08-19	12-08-19		12-08-19	12-08-19		
	Sample ID:	SS30	D02_120819		SS30	T02_120819		
	Project Name:	Tarago Rail Loop lead Management	Tarago Rail Loop lead Management		Tarago Rail Loop lead Management	Tarago Rail Loop lead Management		
	Site Area:							
	Sample Type:	Soil Jar	Soil Jar		Soil Jar	Soil Jar		
	Sample Description							
Total Metals by ICP-AES								
Lead	mg/kg	5	470	570	19	470	405	15

LOR = Limit of Reporting
 <value = Less than the laboratory Limit of Reporting (LOR)
Bold and Shaded cells exceed RPD >30%
Bold indicates when above the acceptance criteria for Trip Spikes/Blanks
 nc = not calculated as one or more results are below the LOR.

	Laboratory Sample number:	S19-Au39077	S19-Au39097	RPD (%)	S19-Au39077	ES1927426001	RPD (%)	
	Sample date:	27/08/2019	27/08/2019		27/08/2019	27/08/2019		
	Sample ID:	SS32	D01_270819		SS32	T01_270819		
	Project Name:	Tarago Rail Loop lead Management	Tarago Rail Loop lead Management		Tarago Rail Loop lead Management	Tarago Rail Loop lead Management		
	Site Area:							
	Sample Type:	Soil Jar	Soil Jar		Soil Jar	Soil Jar		
	Sample Description							
Total Metals by ICP-AES								
Lead	mg/kg	5	2400	2800	15	2400	2300	4

LOR = Limit of Reporting

<value = Less than the laboratory Limit of Reporting (LOR)

Bold and Shaded cells exceed RPD >30%

Bold indicates when above the acceptance criteria for Trip Spikes/Blanks

nc = not calculated as one or more results are below the LOR.

	Laboratory Sample number	S19-Au39087	S19-Au39098	RPD (%)	S19-Au39087	ES1927426002	RPD (%)	
	Sample date:	27/08/2019	27/08/2019		27/08/2019	27/08/2019		
	Sample ID:	SS42	D02_270819		SS42	T02_270819		
	Project Name:	Tarago Rail Loop lead Management	Tarago Rail Loop lead Management		Tarago Rail Loop lead Management	Tarago Rail Loop lead Management		
	Site Area:							
	Sample Type:	Soil Jar	Soil Jar		Soil Jar	Soil Jar		
	Sample Description							
Total Metals by ICP-AES								
Lead	mg/kg	5	240	230	4	240	191	23

LOR = Limit of Reporting
 <value = Less than the laboratory Limit of Reporting (LOR)
Bold and Shaded cells exceed RPD >30%
Bold indicates when above the acceptance criteria for Trip Spikes/Blanks
 nc = not calculated as one or more results are below the LOR.

APPENDIX 5 LABORATORY REPORTS

Ramboll Environ Australia Pty Ltd
Level 3/100 Pacific Highway
North Sydney
NSW 2060



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: Stephen Maxwell
Report 668044-AID
Project Name
Project ID 318000780
Received Date Jul 26, 2019
Date Reported Jul 31, 2019

Methodology:

Asbestos Fibre
 Identification

Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.

NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral
 Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.

NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.

Subsampling Soil
 Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed.

NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.

Bonded asbestos-
 containing material
 (ACM)

The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.

NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Limit of Reporting

The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w).

The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk).

NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos". This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.

Project Name
Project ID 318000780
Date Sampled Jul 26, 2019
Report 668044-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP4 0.1-0.3	19-JI39840	Jul 26, 2019	Approximate Sample 594g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP5 0.1-0.45	19-JI39841	Jul 26, 2019	Approximate Sample 540g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP6 0.1-0.4	19-JI39842	Jul 26, 2019	Approximate Sample 65g Sample consisted of: Brown soil residue and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP7 0.1-0.4	19-JI39843	Jul 26, 2019	Approximate Sample 247g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP8 0.1-0.3	19-JI39844	Jul 26, 2019	Approximate Sample 430g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP9 0.1-0.3	19-JI39845	Jul 26, 2019	Approximate Sample 259g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP10 0.2	19-JI39846	Jul 26, 2019	Approximate Sample 59g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP11 0.1	19-JI39847	Jul 26, 2019	Approximate Sample 53g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP12 0.1	19-JI39848	Jul 26, 2019	Approximate Sample 68g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP13 0.1	19-JI39849	Jul 26, 2019	Approximate Sample 51g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP14 0.1	19-JI39850	Jul 26, 2019	Approximate Sample 66g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP16 0.1	19-JI39851	Jul 26, 2019	Approximate Sample 751g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jul 26, 2019	Indefinite

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668044	Due:	Jul 31, 2019
Project Name:		Phone:	02 9954 8118	Priority:	3 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	TP4 0.1-0.3	Jul 26, 2019		Soil	S19-JI39840	X	X	X
2	TP5 0.1-0.45	Jul 26, 2019		Soil	S19-JI39841	X	X	X
3	TP6 0.1-0.4	Jul 26, 2019		Soil	S19-JI39842	X	X	X
4	TP7 0.1-0.4	Jul 26, 2019		Soil	S19-JI39843	X	X	X
5	TP8 0.1-0.3	Jul 26, 2019		Soil	S19-JI39844	X	X	X
6	TP9 0.1-0.3	Jul 26, 2019		Soil	S19-JI39845	X	X	X
7	TP10 0.2	Jul 26, 2019		Soil	S19-JI39846	X	X	X
8	TP11 0.1	Jul 26, 2019		Soil	S19-JI39847	X	X	X
9	TP12 0.1	Jul 26, 2019		Soil	S19-JI39848	X	X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668044	Due:	Jul 31, 2019
Project Name:		Phone:	02 9954 8118	Priority:	3 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
10	TP13 0.1	Jul 26, 2019		Soil	S19-JI39849	X	X	X
11	TP14 0.1	Jul 26, 2019		Soil	S19-JI39850	X	X	X
12	TP16 0.1	Jul 26, 2019		Soil	S19-JI39851	X	X	X
Test Counts						12	12	12

Internal Quality Control Review and Glossary
General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to "non-bonded / friable".
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

S19-JI39842, S19-JI39846, S19-JI39847, S19-JI39848, S19-JI39849, S19-JI39850: The samples received were not collected in an approved asbestos bag and was therefore sub-sampled from the 250mL glass jar. Valid sub-sampling procedures were applied so as to ensure that the sub-samples to be analysed accurately represented the samples received.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Karthik Surisetty Senior Analyst-Asbestos (NSW)

Authorised by:

Sayeed Abu Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Ramboll Environ Australia Pty Ltd
 Level 3/100 Pacific Highway
 North Sydney
 NSW 2060



NATA Accredited
 Accreditation Number 1261
 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Stephen Maxwell**

Report **668044-S**
 Project name
 Project ID **318000780**
 Received Date **Jul 26, 2019**

Client Sample ID			TP4 0.1-0.3	TP5 0.1-0.45	TP6 0.1-0.4	TP7 0.1-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39840	S19-JI39841	S19-JI39842	S19-JI39843
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	96
TRH C15-C28	50	mg/kg	< 50	60	< 50	150
TRH C29-C36	50	mg/kg	< 50	110	< 50	120
TRH C10-36 (Total)	50	mg/kg	< 50	170	< 50	366
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	68	72	69	64
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	92
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	92
TRH >C16-C34	100	mg/kg	< 100	140	< 100	220
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	120
TRH >C10-C40 (total)*	100	mg/kg	< 100	140	< 100	432
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			TP4 0.1-0.3	TP5 0.1-0.45	TP6 0.1-0.4	TP7 0.1-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39840	S19-JI39841	S19-JI39842	S19-JI39843
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	99	108	112	112
p-Terphenyl-d14 (surr.)	1	%	105	148	INT	126
Heavy Metals						
Arsenic	2	mg/kg	47	13	11	5.8
Cadmium	0.4	mg/kg	3.3	1.1	1.0	0.7
Chromium	5	mg/kg	25	7.4	7.6	< 5
Copper	5	mg/kg	990	180	190	62
Lead	5	mg/kg	8800	1500	1300	510
Mercury	0.1	mg/kg	0.4	0.1	< 0.1	< 0.1
Nickel	5	mg/kg	8.8	< 5	< 5	< 5
Zinc	5	mg/kg	940	320	350	130
% Moisture	1	%	3.0	3.7	2.4	< 1

Client Sample ID			TP8 0.1-0.3	TP9 0.1-0.3	TP10 0.2	TP11 0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39844	S19-JI39845	S19-JI39846	S19-JI39847
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	67	74	71	66
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100

Client Sample ID			TP8 0.1-0.3	TP9 0.1-0.3	TP10 0.2	TP11 0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39844	S19-JI39845	S19-JI39846	S19-JI39847
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	115	129	118	INT
p-Terphenyl-d14 (surr.)	1	%	INT	INT	INT	INT
Heavy Metals						
Arsenic	2	mg/kg	23	8.6	6.1	6.6
Cadmium	0.4	mg/kg	1.6	1.0	< 0.4	< 0.4
Chromium	5	mg/kg	11	6.8	< 5	29
Copper	5	mg/kg	190	91	< 5	9.9
Lead	5	mg/kg	870	730	18	43
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	5.7	< 5	< 5	5.9
Zinc	5	mg/kg	320	200	17	81
% Moisture	1	%	1.1	21	9.1	10

Client Sample ID			TP12 0.1	TP13 0.1	TP14 0.1	TP16 0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39848	S19-JI39849	S19-JI39850	S19-JI39851
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	22	31	< 20
TRH C15-C28	50	mg/kg	< 50	54	89	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	80	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	76	200	< 50

Client Sample ID			TP12 0.1	TP13 0.1	TP14 0.1	TP16 0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39848	S19-JI39849	S19-JI39850	S19-JI39851
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	66	71	66	79
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	150	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	150	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	INT	INT	INT	121
p-Terphenyl-d14 (surr.)	1	%	INT	INT	INT	130
Heavy Metals						
Arsenic	2	mg/kg	< 2	9.6	< 2	2.1
Cadmium	0.4	mg/kg	< 0.4	2.1	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	8.7	< 5	< 5
Copper	5	mg/kg	< 5	21	< 5	< 5
Lead	5	mg/kg	11	39	6.4	10
Mercury	0.1	mg/kg	0.3	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	15	300	14	12
% Moisture	1	%	9.4	11	2.3	7.3

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jul 30, 2019	14 Days
BTEX - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jul 30, 2019	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jul 30, 2019	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jul 30, 2019	14 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Sydney	Jul 30, 2019	14 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Jul 30, 2019	180 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	Jul 26, 2019	14 Days

Company Name: Ramboll Australia Pty Ltd	Order No.:	Received: Jul 26, 2019 5:54 PM
Address: Level 3/100 Pacific Highway North Sydney NSW 2060	Report #: 668044	Due: Jul 31, 2019
	Phone: 02 9954 8118	Priority: 3 Day
	Fax: 02 9954 8150	Contact Name: Stephen Maxwell
Project Name:		
Project ID: 318000780		

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	TP4 0.1-0.3	Jul 26, 2019		Soil	S19-JI39840	X	X	X
2	TP5 0.1-0.45	Jul 26, 2019		Soil	S19-JI39841	X	X	X
3	TP6 0.1-0.4	Jul 26, 2019		Soil	S19-JI39842	X	X	X
4	TP7 0.1-0.4	Jul 26, 2019		Soil	S19-JI39843	X	X	X
5	TP8 0.1-0.3	Jul 26, 2019		Soil	S19-JI39844	X	X	X
6	TP9 0.1-0.3	Jul 26, 2019		Soil	S19-JI39845	X	X	X
7	TP10 0.2	Jul 26, 2019		Soil	S19-JI39846	X	X	X
8	TP11 0.1	Jul 26, 2019		Soil	S19-JI39847	X	X	X
9	TP12 0.1	Jul 26, 2019		Soil	S19-JI39848	X	X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668044	Due:	Jul 31, 2019
Project Name:		Phone:	02 9954 8118	Priority:	3 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell
Eurofins Analytical Services Manager : Andrew Black					

Sample Detail						Asbestos - AS4964	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
10	TP13 0.1	Jul 26, 2019		Soil	S19-JI39849	X	X	X
11	TP14 0.1	Jul 26, 2019		Soil	S19-JI39850	X	X	X
12	TP16 0.1	Jul 26, 2019		Soil	S19-JI39851	X	X	X
Test Counts						12	12	12

Internal Quality Control Review and Glossary
General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	74			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
TRH C10-C14	%	85			70-130	Pass		
LCS - % Recovery								
BTEX								
Benzene	%	100			70-130	Pass		
Toluene	%	96			70-130	Pass		
Ethylbenzene	%	89			70-130	Pass		
m&p-Xylenes	%	89			70-130	Pass		
o-Xylene	%	92			70-130	Pass		
Xylenes - Total	%	90			70-130	Pass		
LCS - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions								
Naphthalene	%	89			70-130	Pass		
TRH C6-C10	%	71			70-130	Pass		
TRH >C10-C16	%	84			70-130	Pass		
LCS - % Recovery								
Polycyclic Aromatic Hydrocarbons								
Acenaphthene	%	90			70-130	Pass		
Acenaphthylene	%	91			70-130	Pass		
Anthracene	%	94			70-130	Pass		
Benz(a)anthracene	%	91			70-130	Pass		
Benzo(a)pyrene	%	96			70-130	Pass		
Benzo(b&j)fluoranthene	%	92			70-130	Pass		
Benzo(g,h,i)perylene	%	96			70-130	Pass		
Benzo(k)fluoranthene	%	105			70-130	Pass		
Chrysene	%	98			70-130	Pass		
Dibenz(a,h)anthracene	%	89			70-130	Pass		
Fluoranthene	%	105			70-130	Pass		
Fluorene	%	107			70-130	Pass		
Indeno(1,2,3-cd)pyrene	%	94			70-130	Pass		
Naphthalene	%	91			70-130	Pass		
Phenanthrene	%	89			70-130	Pass		
Pyrene	%	104			70-130	Pass		
LCS - % Recovery								
Heavy Metals								
Arsenic	%	109			70-130	Pass		
Cadmium	%	99			70-130	Pass		
Chromium	%	103			70-130	Pass		
Copper	%	102			70-130	Pass		
Lead	%	105			70-130	Pass		
Mercury	%	89			70-130	Pass		
Nickel	%	104			70-130	Pass		
Zinc	%	116			70-130	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1				
TRH C10-C14	S19-JI34164	NCP	%	73		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
TRH >C10-C16	S19-JI34164	NCP	%	72		70-130	Pass	
Spike - % Recovery								
Polycyclic Aromatic Hydrocarbons				Result 1				
Acenaphthene	S19-JI46517	NCP	%	112		70-130	Pass	
Acenaphthylene	S19-JI46517	NCP	%	106		70-130	Pass	
Anthracene	S19-JI46517	NCP	%	105		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Benz(a)anthracene	S19-JI46517	NCP	%	110		70-130	Pass	
Benzo(a)pyrene	S19-JI46517	NCP	%	108		70-130	Pass	
Benzo(b&j)fluoranthene	S19-JI46517	NCP	%	108		70-130	Pass	
Benzo(g,h,i)perylene	S19-JI46517	NCP	%	112		70-130	Pass	
Benzo(k)fluoranthene	S19-JI46517	NCP	%	118		70-130	Pass	
Chrysene	S19-JI46517	NCP	%	114		70-130	Pass	
Dibenz(a,h)anthracene	S19-JI46517	NCP	%	103		70-130	Pass	
Fluorene	S19-JI46517	NCP	%	121		70-130	Pass	
Indeno(1.2.3-cd)pyrene	S19-JI46517	NCP	%	108		70-130	Pass	
Naphthalene	S19-JI46517	NCP	%	102		70-130	Pass	
Phenanthrene	S19-JI46517	NCP	%	106		70-130	Pass	
Pyrene	S19-JI46517	NCP	%	128		70-130	Pass	
Spike - % Recovery								
Heavy Metals				Result 1				
Arsenic	S19-JI46290	NCP	%	88		70-130	Pass	
Cadmium	S19-JI46290	NCP	%	87		70-130	Pass	
Chromium	S19-JI46290	NCP	%	90		70-130	Pass	
Copper	S19-JI35169	NCP	%	76		70-130	Pass	
Lead	S19-JI46290	NCP	%	87		70-130	Pass	
Mercury	S19-JI46290	NCP	%	90		70-130	Pass	
Nickel	S19-JI46290	NCP	%	89		70-130	Pass	
Zinc	S19-JI46290	NCP	%	124		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1				
TRH C6-C9	S19-JI39848	CP	%	111		70-130	Pass	
Spike - % Recovery								
BTEX				Result 1				
Benzene	S19-JI39848	CP	%	100		70-130	Pass	
Toluene	S19-JI39848	CP	%	98		70-130	Pass	
Ethylbenzene	S19-JI39848	CP	%	91		70-130	Pass	
m&p-Xylenes	S19-JI39848	CP	%	93		70-130	Pass	
o-Xylene	S19-JI39848	CP	%	92		70-130	Pass	
Xylenes - Total	S19-JI39848	CP	%	93		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
Naphthalene	S19-JI39848	CP	%	73		70-130	Pass	
TRH C6-C10	S19-JI39848	CP	%	105		70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	S19-JI47798	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	S19-JI47798	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	S19-JI47798	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benz(a)anthracene	S19-JI47798	NCP	mg/kg	1.3	< 0.5	110	30%	Fail Q15
Benzo(a)pyrene	S19-JI47798	NCP	mg/kg	1.2	< 0.5	110	30%	Fail Q15
Benzo(b&j)fluoranthene	S19-JI47798	NCP	mg/kg	0.9	< 0.5	120	30%	Fail Q15
Benzo(g,h,i)perylene	S19-JI47798	NCP	mg/kg	0.6	< 0.5	98	30%	Fail Q15
Benzo(k)fluoranthene	S19-JI47798	NCP	mg/kg	1.1	< 0.5	110	30%	Fail Q15
Chrysene	S19-JI47798	NCP	mg/kg	1.2	< 0.5	110	30%	Fail Q15
Dibenz(a,h)anthracene	S19-JI47798	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	S19-JI47798	NCP	mg/kg	3.3	0.8	120	30%	Fail Q15
Fluorene	S19-JI47798	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1.2.3-cd)pyrene	S19-JI47798	NCP	mg/kg	0.6	< 0.5	110	30%	Fail Q15
Naphthalene	S19-JI47798	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Phenanthrene	S19-JI47798	NCP	mg/kg	1.1	< 0.5	97	30%	Fail	Q15
Pyrene	S19-JI47798	NCP	mg/kg	2.7	0.8	110	30%	Fail	Q15
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-JI46289	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	S19-JI46289	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-JI46289	NCP	mg/kg	5.1	5.4	7.0	30%	Pass	
Copper	S19-JI46289	NCP	mg/kg	210	210	<1	30%	Pass	
Lead	S19-JI46289	NCP	mg/kg	6.2	6.4	3.0	30%	Pass	
Mercury	S19-JI46289	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S19-JI46289	NCP	mg/kg	6.6	7.2	8.0	30%	Pass	
Zinc	S19-JI46289	NCP	mg/kg	51	52	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-JI48261	NCP	%	14	13	2.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S19-JI39846	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S19-JI39846	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S19-JI39846	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S19-JI39846	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S19-JI39846	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S19-JI39846	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S19-JI39847	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S19-JI39847	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S19-JI39847	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S19-JI39847	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S19-JI39847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S19-JI39847	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S19-JI39847	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S19-JI39847	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S19-JI39847	CP	mg/kg	< 20	< 20	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Andrew Black	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.



CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

Sydney Laboratory
Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1, 21 Smallwood Pl, Murarie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company		Ramboll		Project No		318000780		Project Manager		Stephen Maxwell		Sampler(s)		SM and SC			
Address		50 Glebe Road the Junction		Project Name				EDD Format (ESdat, EQUIS, Custom)		Excel and PDF		Handed over by		Stephen Maxwell			
Contact Name		Stephen Maxwell		<small>Analyses</small> <small>(Note: Where multiple analyses are requested, please specify "Total" or "Filtered" SUITE code. These codes must be used to attach SUITE print-out)</small> TRH, BTEX, PAH 8 Metlas Asbestos (Presence/Absence)								Email for Invoice		smaxwell@ramboll.com asiapac-accounts@ramboll.com			
Phone No		0478 658 194												Email for Results		smaxwell@ramboll.com jblackwell@ramboll.com	
Special Directions														Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)		<input type="checkbox"/> Overnight (9am)* <input type="checkbox"/> 1 Day* <input type="checkbox"/> 2 Day* <input checked="" type="checkbox"/> 3 Day* <input type="checkbox"/> 5 Day* <input type="checkbox"/> Other () * Surcharges apply	
Purchase Order														Containers			
Quote ID No		180813RAMN_1										1L Plastic					
												250mL Plastic					
												125mL Plastic					
												200mL Amber Glass					
												40mL VOA Vial					
												500mL PFAS Bottle					
												Jar (Glass or HDPE)					
												Other (Asbestos AS4999, WA Guidelines)					
No		Client Sample ID		Sampled Date/Time (dd/mm/yy hh:mm)		Matrix (Solid (S) Water (W))								Sample Comments / Dangerous Goods Hazard Warning			
1		TP4_0.1-0.3		26/07/19		S		X		X		X					
2		TP5-0.1-0.45		26/07/19		S		X		X		X					
3		TP6_0.1-0.4		26/07/19		S		X		X		X					
4		TP7_0.1-0.4		26/07/19		S		X		X		X					
5		TP8_0.1-0.3		26/07/19		S		X		X		X					
6		TP9_0.1-0.3		26/07/19		S		X		X		X					
7		TP10_0.2		26/07/19		S		X		X		X					
8		TP11_0.1		26/07/19		S		X		X		X					
9		TP12_0.1		26/07/19		S		X		X		X		1 1 Asbestos bag for analysis			
10		TP13_0.1		26/07/19		S		X		X		X					
		Total Counts						10		10		10					
Method of Shipment		<input type="checkbox"/> Courier (#)		<input checked="" type="checkbox"/> Hand Delivered		<input type="checkbox"/> Postal		Name		Signature		Date		Time			
Eurofins mgt Laboratory Use Only		Received By		ELVIS D		SYD BNE MEL PER ADL NTL DRW		Signature		Date		26/7/19		Time 5:54pm			
		Received By				SYD BNE MEL PER ADL NTL DRW		Signature		Date		_/_/		Time			
														Temperature 16.7°C			
														Report No 608044			

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

Company		Ramboll		Project No		318000780		Project Manager		Stephen Maxwell		Sampler(s)		SM and SC			
Address		50 Glebe Road the Junction		Project Name				EDD Format (ESdat, EQUIS, Custom)		Excel and PDF		Handed over by		Stephen Maxwell			
Contact Name		Stephen Maxwell		Analyses <small>(Note: Where applicable, please specify "Total" or "Presence" SUITE code must be used to attract SUITE pricing)</small> TRH, BTEX, PAH 8 Metals Asbestos (Presence/Absence)								Email for Invoice		smaxwell@ramboll.com asiapac-accounts@ramboll.com			
Phone No		0478 658 194												Email for Results		smaxwell@ramboll.com jblackwell@ramboll.com	
Purchase Order														Turnaround Time (TAT) Requirements <small>(Default will be 5 days if not ticked)</small>		<input type="checkbox"/> Overnight (9am)* <input type="checkbox"/> 1 Day* <input type="checkbox"/> 2 Day* <input checked="" type="checkbox"/> 3 Day* <input type="checkbox"/> 5 Day* <input type="checkbox"/> Other () * Surcharges apply	
Quote ID No		180813RAMN_1												Containers			
Client Sample ID		Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))												Sample Comments / Dangerous Goods Hazard Warning		
TP14_0.1		26/07/19	S	X	X	X									1		
TP15_0.1		26/07/19	S	X	X	X									1		
															1		
															1		
															1		
															1		
															1		
															1		
Total Counts				2	2	2									2 3		

Method of Shipment: Courier (#) Hand Delivered Postal

Name: _____ Signature: _____ Date: 26/7/19 Time: 5:24PM Temperature: 16.7°C

Received By: Elvis P Signature: _____ Date: 26/7/19 Time: _____ Report No: 668044

Melbourne

6 Monterey Road
Dandenong South Vic 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney

Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane

1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth

2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

Sample Receipt Advice

Company name: **Ramboll Australia Pty Ltd**

Contact name: Stephen Maxwell

Project ID: 318000780

COC number: Not provided

Turn around time: 3 Day

Date/Time received: Jul 26, 2019 5:54 PM

Eurofins reference: **668044**

Sample information

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- All samples have been received as described on the above COC.
- COC has been completed correctly.
- Attempt to chill was evident.
- Appropriately preserved sample containers have been used.
- All samples were received in good condition.
- Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- Appropriate sample containers have been used.
- Split sample sent to requested external lab.
- Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Sample TP15 0.1 not received; instead TP16_0.1 received, logged in for same analysis.

Contact notes

If you have any questions with respect to these samples please contact:

Andrew Black on Phone : (+61) 2 9900 8490 or by e.mail: AndrewBlack@eurofins.com

Results will be delivered electronically via e.mail to Stephen Maxwell - smaxwell@ramboll.com.

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668044	Due:	Jul 31, 2019
Project Name:		Phone:	02 9954 8118	Priority:	3 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	TP4 0.1-0.3	Jul 26, 2019		Soil	S19-JI39840	X	X	X
2	TP5 0.1-0.45	Jul 26, 2019		Soil	S19-JI39841	X	X	X
3	TP6 0.1-0.4	Jul 26, 2019		Soil	S19-JI39842	X	X	X
4	TP7 0.1-0.4	Jul 26, 2019		Soil	S19-JI39843	X	X	X
5	TP8 0.1-0.3	Jul 26, 2019		Soil	S19-JI39844	X	X	X
6	TP9 0.1-0.3	Jul 26, 2019		Soil	S19-JI39845	X	X	X
7	TP10 0.2	Jul 26, 2019		Soil	S19-JI39846	X	X	X
8	TP11 0.1	Jul 26, 2019		Soil	S19-JI39847	X	X	X
9	TP12 0.1	Jul 26, 2019		Soil	S19-JI39848	X	X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668044	Due:	Jul 31, 2019
Project Name:		Phone:	02 9954 8118	Priority:	3 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
10	TP13 0.1	Jul 26, 2019		Soil	S19-JI39849	X	X	X
11	TP14 0.1	Jul 26, 2019		Soil	S19-JI39850	X	X	X
12	TP16 0.1	Jul 26, 2019		Soil	S19-JI39851	X	X	X
Test Counts						12	12	12

Ramboll Environ Australia Pty Ltd
 Level 3/100 Pacific Highway
 North Sydney
 NSW 2060



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: Stephen Maxwell

Report 668047-S
 Project name
 Project ID 318000780
 Received Date Jul 26, 2019

Client Sample ID			TP1 0.1-0.5	TP1 0.5-0.6	TP2 0.1-0.4	TP2 0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39891	S19-JI39892	S19-JI39893	S19-JI39894
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	4400	10	3500	110
% Moisture	1	%	3.9	4.8	2.7	4.4

Client Sample ID			TP2 0.5-0.7	TP3 0.1-0.5	TP3 0.5-0.6	TP3 0.6-0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39895	S19-JI39896	S19-JI39897	S19-JI39898
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	16	29000	74	13
% Moisture	1	%	9.2	9.8	6.4	9.1

Client Sample ID			TP4 0.1-0.3	TP4 0.3-0.4	TP5 0.1-0.45	TP5 0.45-0.55
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39899	S19-JI39900	S19-JI39901	S19-JI39902
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	38000	70	3100	150
% Moisture	1	%	4.2	8.4	5.6	5.4

Client Sample ID			TP5 0.6-0.7	TP6 0.1-0.4	TP6 0.4-0.5	TP6 0.5-0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39903	S19-JI39904	S19-JI39905	S19-JI39906
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	47	6000	20	6.7
% Moisture						
	1	%	12	5.8	6.5	11

Client Sample ID			TP7 0.1-0.4	TP7 0.4-0.5	TP7 0.5-0.7	TP8 0.1-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39907	S19-JI39908	S19-JI39909	S19-JI39910
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	3300	76	6.9	2800
% Moisture						
	1	%	3.7	5.7	11	2.2

Client Sample ID			TP8 0.3-0.5	TP8 0.5-0.8	TP9 0.1-0.3	TP9 0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39911	S19-JI39912	S19-JI39913	S19-JI39914
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	24	22	600	< 5
% Moisture						
	1	%	6.0	9.5	2.4	6.1

Client Sample ID			TP9 0.5-0.7	TP15 0.1	TP15 0.8	SS1 0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39915	S19-JI39918	S19-JI39919	S19-JI39920
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	8.1	27	26	39
% Moisture						
	1	%	10	6.1	12	4.6

Client Sample ID			SS2 0.0-0.1	SS3 0.0-0.1	SS4 0.0-0.1	SS5 0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39921	S19-JI39922	S19-JI39923	S19-JI39924
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	110	130	120	43
% Moisture						
	1	%	3.2	7.5	5.6	2.8

Client Sample ID			SS6 0.0-0.1	SS7 0.0-0.1	SS8 0.0-0.1	SS9 0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39925	S19-JI39926	S19-JI39927	S19-JI39928
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	110	4100	340	140
% Moisture						
	1	%	2.8	4.4	19	6.2

Client Sample ID			SS10 0.0-0.1	SS11 0.0-0.1	SS12 0.0-0.1	SS13 0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39929	S19-JI39930	S19-JI39931	S19-JI39932
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	780	2200	32000	2600
% Moisture						
	1	%	2.2	5.8	3.3	1.2

Client Sample ID			SS14 0.0-0.1	SS15 0.0-0.1	SS16 0.0-0.1	D02_260719
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39933	S19-JI39934	S19-JI39935	S19-JI39936
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	31	350	15000	280
% Moisture						
	1	%	6.8	4.7	1.9	5.0

Client Sample ID			D03_260719	SS17_0.0-0.1	SS18_0.0-0.1	SS19_0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39937	S19-JI39997	S19-JI39998	S19-JI39999
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	120	25	34	26000
% Moisture						
	1	%	5.5	3.2	4.8	2.4

Client Sample ID			SS20_0.0-0.1	SS21	SS22
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S19-JI40000	S19-JI40001	S19-JI40002
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit			
Heavy Metals					
Lead	5	mg/kg	35000	610	540
% Moisture					
	1	%	3.6	2.2	3.4

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Jul 29, 2019	180 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	Jul 29, 2019	14 Days

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	TP1 0.1-0.5	Jul 26, 2019		Soil	S19-JI39891		X	X
2	TP1 0.5-0.6	Jul 26, 2019		Soil	S19-JI39892		X	X
3	TP2 0.1-0.4	Jul 26, 2019		Soil	S19-JI39893		X	X
4	TP2 0.4-0.5	Jul 26, 2019		Soil	S19-JI39894		X	X
5	TP2 0.5-0.7	Jul 26, 2019		Soil	S19-JI39895		X	X
6	TP3 0.1-0.5	Jul 26, 2019		Soil	S19-JI39896		X	X
7	TP3 0.5-0.6	Jul 26, 2019		Soil	S19-JI39897		X	X
8	TP3 0.6-0.7	Jul 26, 2019		Soil	S19-JI39898		X	X
9	TP4 0.1-0.3	Jul 26, 2019		Soil	S19-JI39899		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
10	TP4 0.3-0.4	Jul 26, 2019		Soil	S19-JI39900		X	X
11	TP5 0.1-0.45	Jul 26, 2019		Soil	S19-JI39901		X	X
12	TP5 0.45-0.55	Jul 26, 2019		Soil	S19-JI39902		X	X
13	TP5 0.6-0.7	Jul 26, 2019		Soil	S19-JI39903		X	X
14	TP6 0.1-0.4	Jul 26, 2019		Soil	S19-JI39904		X	X
15	TP6 0.4-0.5	Jul 26, 2019		Soil	S19-JI39905		X	X
16	TP6 0.5-0.7	Jul 26, 2019		Soil	S19-JI39906		X	X
17	TP7 0.1-0.4	Jul 26, 2019		Soil	S19-JI39907		X	X
18	TP7 0.4-0.5	Jul 26, 2019		Soil	S19-JI39908		X	X
19	TP7 0.5-0.7	Jul 26, 2019		Soil	S19-JI39909		X	X
20	TP8 0.1-0.3	Jul 26, 2019		Soil	S19-JI39910		X	X
21	TP8 0.3-0.5	Jul 26, 2019		Soil	S19-JI39911		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
22	TP8 0.5-0.8	Jul 26, 2019		Soil	S19-JI39912		X	X
23	TP9 0.1-0.3	Jul 26, 2019		Soil	S19-JI39913		X	X
24	TP9 0.3-0.5	Jul 26, 2019		Soil	S19-JI39914		X	X
25	TP9 0.5-0.7	Jul 26, 2019		Soil	S19-JI39915		X	X
26	TP15 0.1	Jul 26, 2019		Soil	S19-JI39918		X	X
27	TP15 0.8	Jul 26, 2019		Soil	S19-JI39919		X	X
28	SS1 0.0-0.1	Jul 26, 2019		Soil	S19-JI39920		X	X
29	SS2 0.0-0.1	Jul 26, 2019		Soil	S19-JI39921		X	X
30	SS3 0.0-0.1	Jul 26, 2019		Soil	S19-JI39922		X	X
31	SS4 0.0-0.1	Jul 26, 2019		Soil	S19-JI39923		X	X
32	SS5 0.0-0.1	Jul 26, 2019		Soil	S19-JI39924		X	X
33	SS6 0.0-0.1	Jul 26, 2019		Soil	S19-JI39925		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
34	SS7 0.0-0.1	Jul 26, 2019		Soil	S19-JI39926		X	X
35	SS8 0.0-0.1	Jul 26, 2019		Soil	S19-JI39927		X	X
36	SS9 0.0-0.1	Jul 26, 2019		Soil	S19-JI39928		X	X
37	SS10 0.0-0.1	Jul 26, 2019		Soil	S19-JI39929		X	X
38	SS11 0.0-0.1	Jul 26, 2019		Soil	S19-JI39930		X	X
39	SS12 0.0-0.1	Jul 26, 2019		Soil	S19-JI39931		X	X
40	SS13 0.0-0.1	Jul 26, 2019		Soil	S19-JI39932		X	X
41	SS14 0.0-0.1	Jul 26, 2019		Soil	S19-JI39933		X	X
42	SS15 0.0-0.1	Jul 26, 2019		Soil	S19-JI39934		X	X
43	SS16 0.0-0.1	Jul 26, 2019		Soil	S19-JI39935		X	X
44	D02_260719	Jul 26, 2019		Soil	S19-JI39936		X	X
45	D03_260719	Jul 26, 2019		Soil	S19-JI39937		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
46	TP10_0.8-1.0	Jul 26, 2019		Soil	S19-JI39990	X		
47	TP11_0.5-0.6	Jul 26, 2019		Soil	S19-JI39991	X		
48	TP11_0.8-1.0	Jul 26, 2019		Soil	S19-JI39992	X		
49	TP12_0.5	Jul 26, 2019		Soil	S19-JI39993	X		
50	TP13_0.5-0.6	Jul 26, 2019		Soil	S19-JI39994	X		
51	TP13_0.8-0.9	Jul 26, 2019		Soil	S19-JI39995	X		
52	TP14_0.6-0.8	Jul 26, 2019		Soil	S19-JI39996	X		
53	SS17_0.0-0.1	Jul 26, 2019		Soil	S19-JI39997		X	X
54	SS18_0.0-0.1	Jul 26, 2019		Soil	S19-JI39998		X	X
55	SS19_0.0-0.1	Jul 26, 2019		Soil	S19-JI39999		X	X
56	SS20_0.0-0.1	Jul 26, 2019		Soil	S19-JI40000		X	X
57	SS21	Jul 26, 2019		Soil	S19-JI40001		X	X

Company Name: Ramboll Australia Pty Ltd	Order No.:	Received: Jul 26, 2019 5:54 PM
Address: Level 3/100 Pacific Highway North Sydney NSW 2060	Report #: 668047	Due: Jul 29, 2019
	Phone: 02 9954 8118	Priority: 1 Day
	Fax: 02 9954 8150	Contact Name: Stephen Maxwell
Project Name:		
Project ID: 318000780		

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
58	SS22	Jul 26, 2019		Soil	S19-JI40002		X	X
59	D01_260719	Jul 26, 2019		Soil	S19-JI40003	X		
Test Counts						8	51	51

Internal Quality Control Review and Glossary
General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test				Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code		
Method Blank											
Heavy Metals											
Lead				mg/kg	< 5		5	Pass			
LCS - % Recovery											
Heavy Metals											
Lead				%	127		70-130	Pass			
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code		
Spike - % Recovery											
Heavy Metals											
Lead				S19-JI39895	CP	%	119	70-130	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code		
Duplicate											
Heavy Metals											
Lead				S19-JI39894	CP	mg/kg	110	92	19	30%	Pass
Duplicate											
% Moisture				S19-JI39896	CP	%	9.8	9.4	5.0	30%	Pass
Duplicate											
Heavy Metals											
Lead				S19-JI39904	CP	mg/kg	6000	6600	10	30%	Pass
Duplicate											
% Moisture				S19-JI39906	CP	%	11	11	4.0	30%	Pass
Duplicate											
Heavy Metals											
Lead				S19-JI39914	CP	mg/kg	< 5	< 5	<1	30%	Pass
Duplicate											
% Moisture				S19-JI39918	CP	%	6.1	5.5	10	30%	Pass
Duplicate											
% Moisture				S19-JI39928	CP	%	6.2	5.2	17	30%	Pass
Duplicate											
% Moisture				S19-JI39997	CP	%	3.2	3.8	17	30%	Pass

Comments**Sample Integrity**

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Andrew Black Analytical Services Manager
Gabriele Cordero Senior Analyst-Metal (NSW)

**Glenn Jackson
General Manager**

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.



CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

Sydney Laboratory
Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2056
02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1, 21 Smallwood Pl., Murarie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company		Ramboll		Project No		318000780		Project Manager		Stephen Maxwell		Sampler(s)		SM and SC	
Address		50 Glebe Road the Junction		Project Name				EDD Format (ESdat, EQUIS, Custom)		Excel and PDF		Handed over by		Stephen Maxwell	
Contact Name		Stephen Maxwell		Analyses <small>Note: Where metals are requested, please specify 'Total' or 'Filtered'. SUITE code must be used to attract SUITE pricing.</small>		Lead						Email for Invoice		smaxwell@ramboll.com asiapac-accounts@ramboll.com	
Phone No		0478 658 194										Email for Results		smaxwell@ramboll.com jblackwell@ramboll.com	
Special Directions												Containers		Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)	
Purchase Order												1L Plastic		<input type="checkbox"/> Overnight (9am)*	
Quote ID No		180813RAMN_1		250mL Plastic		<input checked="" type="checkbox"/> 1 Day* <input type="checkbox"/> 2 Day*									
				125mL Plastic		<input type="checkbox"/> 3 Day* <input type="checkbox"/> 5 Day*									
				200mL Amber Glass		<input type="checkbox"/> Other ()									
				40mL VOA vial		Sample Comments / Dangerous Goods Hazard Warning									
				500mL PFAS Bottle											
				Jar (Glass or HDPE)											
				Other (Asbestos / AS4964, WA Guidelines)											
No	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))												
1	TP1_0.1-0.5	26/07/19	S	X											
2	TP1_0.5-0.6	26/07/19	S	X											
3	TP2_0.1-0.4	26/07/19	S	X											
4	TP2_0.4-0.5	26/07/19	S	X											
5	TP2_0.5-0.7	26/07/19	S	X											
6	TP3_0.1-0.5	26/07/19	S	X											
7	TP3_0.5-0.6	26/07/19	S	X											
8	TP3_0.6-0.7	26/07/19	S	X											
9	TP4_0.1-0.3	26/07/19	S	X								1	1	Asbestos bag for analysis	
10	TP4_0.3-0.4	26/07/19	S	X								1			
Total Counts				10								10	1		
Method of Shipment		<input type="checkbox"/> Courier (#) <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		Name		Signature		Date		Time		Date		Time	
Eurofins mgt Laboratory Use Only		Received By <i>Elvio P</i>		SYD BNE MEL PER ADL NTL DRW		Signature <i>[Signature]</i>		Date <i>26/7/19</i>		Time <i>5:50AM</i>		Temperature <i>16.7°C</i>		Report No <i>668047</i>	
		Received By		SYD BNE MEL PER ADL NTL DRW		Signature		Date		Time		Report No			

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

QSS306_R7 Modified by: Dr. R Symons Approved by: T. Lelakland Approved on: 17 August 2017



CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

Sydney Laboratory
Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1, 21 Smallwood Pl., Murarrie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9800 EnviroSampleWA@eurofins.com

Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company		Ramboll		Project No		318000780		Project Manager		Stephen Maxwell		Sampler(s)		SM and SC	
Address		50 Glebe Road the Junction		Project Name				EDD Format (ESdat, EQUIS, Custom)		Excel and PDF		Handed over by		Stephen Maxwell	
Contact Name		Stephen Maxwell		Analysis <small>(Note: Where metals are requested, please specify "Total" or "Filtered" SUITE code must be used to attract SUITE pricing.)</small>		Lead						Email for Invoice		smaxwell@ramboll.com asiapac-accounts@ramboll.com	
Phone No		0478 658 194										Email for Results		smaxwell@ramboll.com jblackwell@ramboll.com	
Special Directions												Containers		Turnaround Time (TAT) Requirements (Default will be 5 days if not noted)	
Purchase Order												1L Plastic		<input type="checkbox"/> Overnight (9am)*	
Quote ID No		180813RAMN_1		Matrix (Solid (S) Water (W))				250mL Plastic		<input checked="" type="checkbox"/> 1 Day* <input type="checkbox"/> 2 Day*		3 Day* <input type="checkbox"/> 5 Day		*Surcharges apply	
No		Client Sample ID		Sampled Date/Time (dd/mm/yy hh:mm)						125mL Plastic		Other (Asbestos AS4964, WA Guidelines)		Sample Comments / Dangerous Goods Hazard Warning	
1		TP5-0.1-0.45		26/07/19		S		X						1 1	
2		TP5_0.45-0.55		26/07/19		S		X						1	
3		TP5_0.6-0.7		26/07/19		S		X						1	
4		TP6_0.1-0.4		26/07/19		S		X						1 1	
5		TP6_0.4-0.5		26/07/19		S		X						1	
6		TP6_0.5-0.7		26/07/19		S		X						1	
7		TP7_0.1-0.4		26/07/19		S		X						1 1	
8		TP7_0.4-0.5		26/07/19		S		X						1	
9		TP7_0.5-0.7		26/07/19		S		X						1	
10		TP8_0.1-0.3		26/07/19		S		X						1 1	
Total Counts				10										10 4	
Method of Shipment		<input type="checkbox"/> Courier (#) <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		Name		Signature		Date		Date		Time		Time	
Eurofins mgt Laboratory Use Only		Received By <i>Eliso</i>		SYD BNE MEL PER ADL NTL DRW		Signature <i>[Signature]</i>		Date 26/7/19		Date		Time 5:04pm		Temperature 16.9°C	
		Received By		SYD BNE MEL PER ADL NTL DRW		Signature		Date		Date		Time		Report No	

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt



CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

Sydney Laboratory
Unit F3 Bid.F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9500 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1, 21 Smallwood Pl., Murarie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVIC@eurofins.com

Company		Ramboll		Project No		318000780		Project Manager		Stephen Maxwell		Sampler(s)		SM and SC			
Address		50 Glebe Road the Junction		Project Name				EDD Format (ESdat, EQuIS, Custom)		Excel and PDF		Handed over by		Stephen Maxwell			
Contact Name		Stephen Maxwell		Analysis <small>(Note: Where capitals are requested, please specify "Total" or "Filler" (S) or "SUIE" code must be used to attract (S) or (W) pricing.)</small>		Lead						Email for Invoice		smaxwell@ramboll.com asiapac-accounts@ramboll.com			
Phone No		0478 658 194										Email for Results		smaxwell@ramboll.com jblackwell@ramboll.com			
Special Directions														Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)		<input type="checkbox"/> Overnight (9am)* <input checked="" type="checkbox"/> 1 Day* <input type="checkbox"/> 2 Day* <input type="checkbox"/> 3 Day* <input type="checkbox"/> 5 Day* <input type="checkbox"/> Other () * Surcharges apply	
Purchase Order																Containers	
Quote ID No		180813RAMN_1										1L Plastic 250mL Plastic 125mL Plastic 200mL Amber Glass 40mL VOA vial 500mL PFAS Bottle Jar (Glass or HDPE) Other (Asbestos AS4984, WA Guidelines)					
No	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))														
1	TP80.3-0.5	26/07/19	S	X													
2	TP8_0.5-0.8	26/07/19	S	X													
3	TP9_0.1-0.3	26/07/19	S	X													
4	TP9_0.3-0.5	26/07/19	S	X													
5	TP9_0.5-0.7	26/07/19	S	X													
6	TP15_0.1	26/07/19	S	X													
7	TP15_0.8	26/07/19	S	X													
8	SS1_0.0-0.1	26/07/19	S	X													
9																	
10																	
Total Counts				8										8	1		
Method of Shipment		<input type="checkbox"/> Courier (#) <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		Name		Signature		Date		Time		Date		Time			
Eurofins mgt Laboratory Use Only		Received By		SYD BNE MEL PER ADL NTL DRW Signature: <i>[Signature]</i>		Date		26/7/19		Time		5:54 PM		Temperature 16.7°C			
		Received By		SYD BNE MEL PER ADL NTL DRW Signature: _____		Date		___/___/___		Time		___:___		Report No			

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt



CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

Sydney Laboratory
Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9600 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1, 21 Smallwood Pl., Murarie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVc@eurofins.com

Company		Ramboll		Project No	318000780				Project Manager	Stephen Maxwell				Sampler(s)	SM and SC		
Address		50 Glebe Road the Junction		Project Name					EDD Format (ESdat, EQUS, Custom)	Excel and PDF				Handed over by	Stephen Maxwell		
Contact Name		Stephen Maxwell		<small>ANALYSIS</small> <small>(Note: Where metals are requested, please specify "Total" or "Filtered" SUIE code must be used to attract SUIE pricing)</small>	Lead										Email for Invoice	smaxwell@ramboll.com asiapac-accounts@ramboll.com	
Phone No		0478 658 194													Email for Results	smaxwell@ramboll.com jblackwell@ramboll.com	
Special Directions															Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)		
Purchase Order															Containers		
Quote ID No		180813RAMN_1												<input type="checkbox"/> Overnight (9am)* <input checked="" type="checkbox"/> 1 Day* <input type="checkbox"/> 2 Day* <input type="checkbox"/> 3 Day* <input type="checkbox"/> 5 Day* <input type="checkbox"/> Other () * Surcharges apply			
No	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))													Sample Comments / Dangerous Goods Hazard Warning	
1	SS2_0-0.1	26/07/19	S	X												1	
2	SS3-0-0.1	26/07/19	S	X												1	
3	SS4_0-0.1	26/07/19	S	X												1	
4	SS5_0-0.1	26/07/19	S	X												1	
5	SS6_0-0.1	26/07/19	S	X												1	
6	SS7_0-0.1	26/07/19	S	X												1	
7	SS8_0-0.1	26/07/19	S	X												1	
8	SS9_0-0.1	26/07/19	S	X												1	
9	SS10_0-0.1	26/07/19	S	X												1	
10	SS11_0-0.1	26/07/19	S	X												1	
Total Counts				10												10	

Method of Shipment	<input type="checkbox"/> Courier (#)	<input checked="" type="checkbox"/> Hand Delivered	<input type="checkbox"/> Postal	Name	Signature	Date	Time
Eurofins mgt Laboratory Use Only	Received By	<i>[Signature]</i>	SYD BNE MEL PER ADL NTL DRW	Signature	<i>[Signature]</i>	Date	26/7/19
	Received By		SYD BNE MEL PER ADL NTL DRW	Signature		Date	Time

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt



CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

Sydney Laboratory
Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1, 21 Smallwood Pl., Murarrie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company		Ramboll		Project No		318000780		Project Manager		Stephen Maxwell		Sampler(s)		SM and SC			
Address		50 Glebe Road the Junction		Project Name				EDD Format (ESdat, EQuIS, Custom)		Excel and PDF		Handed over by		Stephen Maxwell			
Contact Name		Stephen Maxwell		Analyses <small>(Note: Where metals are requested, please specify "Total" or "Filtered" SUITE code must be used to attract SUITE pricing.)</small> Lead								Email for Invoice		smaxwell@ramboll.com asiapac-accounts@ramboll.com			
Phone No		0478 658 194												Email for Results		smaxwell@ramboll.com cgoodbody@ramboll.com	
Special Directions														Turnaround Time (TAT) Requirements (default will be 5 days if not ticked)		<input type="checkbox"/> Overnight (9am)* <input checked="" type="checkbox"/> 1 Day* <input type="checkbox"/> 2 Day* <input type="checkbox"/> 3 Day* <input type="checkbox"/> 5 Day* <input type="checkbox"/> Other () * Surcharges apply	
Purchase Order														Containers		1L Plastic 250mL Plastic 125mL Plastic 200mL Amber Glass 40mL VOA vial 500mL PFAS Bottle Jar (Glass or HDPE) Other (Asbestos AS4964, WA Qualitates)	
Quote ID No		180813RAMN_1		Matrix (Solid (S) Water (W))										Sample Comments / Dangerous Goods Hazard Warning			
No.	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))														
1	SS12_0-0.1	26/07/19	S	X										1			
2	SS13_0-0.1	26/07/19	S	X										1			
3	SS14_0-0.1	26/07/19	S	X										1			
4	SS15_0-0.1	26/07/19	S	X										1			
5	SS16_0-0.1	26/07/19	S	X										1			
6																	
7	D02_260719	26/07/19	S	X										1			
8	D03_260719	26/07/19	S	X										1			
9	T02_260719	26/07/19	S	X										1	Please send to Envirolab for analysis		
10	T03_260719	26/07/19	S	X										1	Please send to Envirolab for analysis		
Total Counts				9										9			
Method of Shipment		<input type="checkbox"/> Courier (#) <input checked="" type="checkbox"/> Hand Delivered		<input type="checkbox"/> Postal		Name		Signature		Date		Time					
Eurofins mgt Laboratory Use Only		Received By <i>FNIS</i>		SYD BNE MEL PER ADL NTL DRW		Signature <i>[Signature]</i>		Date 26/7/19		Time 5:54pm		Temperature 16.7C					
		Received By		SYD BNE MEL PER ADL NTL DRW		Signature		Date		Time		Report No					

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

Enviro Sample NSW

From: Stephen Maxwell <SMAXWELL@ramboll.com>
Sent: Monday, 29 July 2019 9:08 AM
To: Enviro Sample NSW
Cc: Joshua Blackwell
Subject: RE: Eurofins | mgt Sample Receipt Advice - Report 668047 : Site 318000780

Follow Up Flag: Follow up
Flag Status: Flagged

Hi

Please report TP16 0.1 & TP16 0.8 as TP15 0.1 & TP15 0.8 (these were labelled out of sequence in the field).

Please analyse SS17_0-0.1, SS18_0.0-0.1, SS19_0.0-0.1, SS20_0.0-0.1, SS21, SS22 for lead on fastest available turnaround. {Please hold bags for SS15, SS16, SS19 and SS20.

Please hold all other samples described in **red** in trail below.

Kind regards

Stephen Maxwell
Lead Consultant

D +61 478658194
M +61 478658194
smaxwell@ramboll.com

Ramboll Australia Pty Ltd.
ACN 095 437 442
ABN 49 095 437 442

From: EnviroSampleNSW@eurofins.com <EnviroSampleNSW@eurofins.com>
Sent: 26 July, 2019 7:20 PM
To: Stephen Maxwell <SMAXWELL@ramboll.com>
Cc: Joshua Blackwell <JBLACKWELL@ramboll.com>
Subject: Eurofins | mgt Sample Receipt Advice - Report 668047 : Site 318000780

Dear Valued Client,

T02_260719(jar+bag) & T03_260719(jar) to be sent to Envirolab for analysis.

Sample TP15 0.1 & TP15 0.8 not received; analysis cancelled. Additional samples TP16 0.1 & TP16 0.8 received and placed on analysis.

Extra samples received, TP10_0.8-1.0, TP11_0.5-0.6, TP11_0.8-1.0, TP12_0.5, TP13_0.5-0.6, TP13_0.8-0.9, TP14_0.6-0.8, SS17_0.0-0.1, SS18_0.0-0.1 - ALL JARS.

SS19_0.0-0.1(JAR+2BAGS), SS20_0.0-0.1(JAR+2 BAGS), SS21(BAG), SS22(BAG), all placed on HOLD. Please advise further instructions.

Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins Analytical Services Manager as soon as possible to make certain that they get changed.

Regards

Rupan Virk
Sample Receipt

Eurofins | Environment Testing

Unit F3, Parkview Building

16 Mars Road

LANE COVE WEST NSW 2066

AUSTRALIA

Phone: +61 299 008 400

Email: EnviroSampleNSW@eurofins.com

Website: environment.eurofins.com.au

[EnviroNote 1068 - Eurofins Perth Laboratory](#)

[EnviroNote 1069 - Eurofins Overnight TAT](#)

[EnviroNote 1079 - PFAS Fingerprinting](#)

[EnviroNote 1080 - Total Organofluorine Analysis & PFAS Investigations](#)

Click [here](#) to report this email as spam.

ScannedByWebsenseForEurofins

Melbourne

6 Monterey Road
Dandenong South Vic 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney

Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane

1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth

2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

Sample Receipt Advice

Company name: **Ramboll Australia Pty Ltd**

Contact name: **Stephen Maxwell**

Project ID: **318000780**

COC number: **Not provided**

Turn around time: **1 Day**

Date/Time received: **Jul 26, 2019 5:54 PM**

Eurofins reference: **668047**

Sample information

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- All samples have been received as described on the above COC.
- COC has been completed correctly.
- Attempt to chill was evident.
- Appropriately preserved sample containers have been used.
- All samples were received in good condition.
- Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- Appropriate sample containers have been used.
- Split sample sent to requested external lab.
- Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Andrew Black on Phone : (+61) 2 9900 8490 or by e.mail: AndrewBlack@eurofins.com

Results will be delivered electronically via e.mail to Stephen Maxwell - smaxwell@ramboll.com.

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	TP1 0.1-0.5	Jul 26, 2019		Soil	S19-JI39891		X	X
2	TP1 0.5-0.6	Jul 26, 2019		Soil	S19-JI39892		X	X
3	TP2 0.1-0.4	Jul 26, 2019		Soil	S19-JI39893		X	X
4	TP2 0.4-0.5	Jul 26, 2019		Soil	S19-JI39894		X	X
5	TP2 0.5-0.7	Jul 26, 2019		Soil	S19-JI39895		X	X
6	TP3 0.1-0.5	Jul 26, 2019		Soil	S19-JI39896		X	X
7	TP3 0.5-0.6	Jul 26, 2019		Soil	S19-JI39897		X	X
8	TP3 0.6-0.7	Jul 26, 2019		Soil	S19-JI39898		X	X
9	TP4 0.1-0.3	Jul 26, 2019		Soil	S19-JI39899		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
10	TP4 0.3-0.4	Jul 26, 2019		Soil	S19-JI39900		X	X
11	TP5 0.1-0.45	Jul 26, 2019		Soil	S19-JI39901		X	X
12	TP5 0.45-0.55	Jul 26, 2019		Soil	S19-JI39902		X	X
13	TP5 0.6-0.7	Jul 26, 2019		Soil	S19-JI39903		X	X
14	TP6 0.1-0.4	Jul 26, 2019		Soil	S19-JI39904		X	X
15	TP6 0.4-0.5	Jul 26, 2019		Soil	S19-JI39905		X	X
16	TP6 0.5-0.7	Jul 26, 2019		Soil	S19-JI39906		X	X
17	TP7 0.1-0.4	Jul 26, 2019		Soil	S19-JI39907		X	X
18	TP7 0.4-0.5	Jul 26, 2019		Soil	S19-JI39908		X	X
19	TP7 0.5-0.7	Jul 26, 2019		Soil	S19-JI39909		X	X
20	TP8 0.1-0.3	Jul 26, 2019		Soil	S19-JI39910		X	X
21	TP8 0.3-0.5	Jul 26, 2019		Soil	S19-JI39911		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
22	TP8 0.5-0.8	Jul 26, 2019		Soil	S19-JI39912		X	X
23	TP9 0.1-0.3	Jul 26, 2019		Soil	S19-JI39913		X	X
24	TP9 0.3-0.5	Jul 26, 2019		Soil	S19-JI39914		X	X
25	TP9 0.5-0.7	Jul 26, 2019		Soil	S19-JI39915		X	X
26	TP15 0.1	Jul 26, 2019		Soil	S19-JI39918		X	X
27	TP15 0.8	Jul 26, 2019		Soil	S19-JI39919		X	X
28	SS1 0.0-0.1	Jul 26, 2019		Soil	S19-JI39920		X	X
29	SS2 0.0-0.1	Jul 26, 2019		Soil	S19-JI39921		X	X
30	SS3 0.0-0.1	Jul 26, 2019		Soil	S19-JI39922		X	X
31	SS4 0.0-0.1	Jul 26, 2019		Soil	S19-JI39923		X	X
32	SS5 0.0-0.1	Jul 26, 2019		Soil	S19-JI39924		X	X
33	SS6 0.0-0.1	Jul 26, 2019		Soil	S19-JI39925		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
34	SS7 0.0-0.1	Jul 26, 2019		Soil	S19-JI39926		X	X
35	SS8 0.0-0.1	Jul 26, 2019		Soil	S19-JI39927		X	X
36	SS9 0.0-0.1	Jul 26, 2019		Soil	S19-JI39928		X	X
37	SS10 0.0-0.1	Jul 26, 2019		Soil	S19-JI39929		X	X
38	SS11 0.0-0.1	Jul 26, 2019		Soil	S19-JI39930		X	X
39	SS12 0.0-0.1	Jul 26, 2019		Soil	S19-JI39931		X	X
40	SS13 0.0-0.1	Jul 26, 2019		Soil	S19-JI39932		X	X
41	SS14 0.0-0.1	Jul 26, 2019		Soil	S19-JI39933		X	X
42	SS15 0.0-0.1	Jul 26, 2019		Soil	S19-JI39934		X	X
43	SS16 0.0-0.1	Jul 26, 2019		Soil	S19-JI39935		X	X
44	D02_260719	Jul 26, 2019		Soil	S19-JI39936		X	X
45	D03_260719	Jul 26, 2019		Soil	S19-JI39937		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
46	TP10_0.8-1.0	Jul 26, 2019		Soil	S19-JI39990	X		
47	TP11_0.5-0.6	Jul 26, 2019		Soil	S19-JI39991	X		
48	TP11_0.8-1.0	Jul 26, 2019		Soil	S19-JI39992	X		
49	TP12_0.5	Jul 26, 2019		Soil	S19-JI39993	X		
50	TP13_0.5-0.6	Jul 26, 2019		Soil	S19-JI39994	X		
51	TP13_0.8-0.9	Jul 26, 2019		Soil	S19-JI39995	X		
52	TP14_0.6-0.8	Jul 26, 2019		Soil	S19-JI39996	X		
53	SS17_0.0-0.1	Jul 26, 2019		Soil	S19-JI39997		X	X
54	SS18_0.0-0.1	Jul 26, 2019		Soil	S19-JI39998		X	X
55	SS19_0.0-0.1	Jul 26, 2019		Soil	S19-JI39999		X	X
56	SS20_0.0-0.1	Jul 26, 2019		Soil	S19-JI40000		X	X
57	SS21	Jul 26, 2019		Soil	S19-JI40001		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell
Eurofins Analytical Services Manager : Andrew Black					

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
58	SS22	Jul 26, 2019		Soil	S19-JI40002		X	X
59	D01_260719	Jul 26, 2019		Soil	S19-JI40003	X		
Test Counts						8	51	51

Ramboll Environ Australia Pty Ltd
 Level 3/100 Pacific Highway
 North Sydney
 NSW 2060



NATA Accredited
 Accreditation Number 1261
 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Stephen Maxwell**

Report **668864-L**
 Project name **ADDITIONAL**
 Project ID **318000780**
 Received Date **Jul 31, 2019**

Client Sample ID			TP1 0.1-0.5	TP5 0.1-0.45	TP7 0.1-0.4	TP3 0.1-0.5
Sample Matrix			US Leachate	US Leachate	US Leachate	AUS Leachate - Reagent Water
Eurofins Sample No.			S19-JI50740	S19-JI50741	S19-JI50742	S19-JI50743
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	0.01	mg/L	4.3	32	8.2	1.1
AUS Leaching Procedure						
Leachate Fluid ^{C01}		comment	-	-	-	4.0
pH (initial)	0.1	pH Units	-	-	-	4.1
pH (Leachate fluid)	0.1	pH Units	-	-	-	7.0
pH (off)	0.1	pH Units	-	-	-	3.8
USA Leaching Procedure						
Leachate Fluid ^{C01}		comment	1.0	1.0	1.0	-
pH (initial)	0.1	pH Units	4.7	4.6	4.7	-
pH (off)	0.1	pH Units	5.2	5.0	5.0	-
pH (USA HCl addition)	0.1	pH Units	1.8	1.8	1.8	-

Client Sample ID			SS20 0-0.1	TP4 0.1-0.3
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			S19-JI50744	S19-JI50745
Date Sampled			Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit		
Heavy Metals				
Lead	0.01	mg/L	0.03	< 0.01
AUS Leaching Procedure				
Leachate Fluid ^{C01}		comment	4.0	4.0
pH (initial)	0.1	pH Units	3.7	4.1
pH (Leachate fluid)	0.1	pH Units	7.0	7.0
pH (off)	0.1	pH Units	3.5	4.3

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Heavy Metals - Method:	Sydney	Jul 31, 2019	180 Days
AUS Leaching Procedure - Method:	Sydney	Jul 31, 2019	7 Days
USA Leaching Procedure - Method:	Sydney	Jul 31, 2019	14 Days

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 31, 2019 5:03 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668864	Due:	Aug 2, 2019
Project Name:	ADDITIONAL	Phone:	02 9954 8118	Priority:	2 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Lead	AUS Leaching Procedure	USA Leaching Procedure
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	TP1 0.1-0.5	Jul 26, 2019		US Leachate	S19-JI50740	X		X
2	TP5 0.1-0.45	Jul 26, 2019		US Leachate	S19-JI50741	X		X
3	TP7 0.1-0.4	Jul 26, 2019		US Leachate	S19-JI50742	X		X
4	TP3 0.1-0.5	Jul 26, 2019		AUS Leachate - Reagent Water	S19-JI50743	X	X	
5	SS20 0-0.1	Jul 26, 2019		AUS Leachate - Reagent Water	S19-JI50744	X	X	
6	TP4 0.1-0.3	Jul 26, 2019		AUS Leachate - Reagent	S19-JI50745	X	X	

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 31, 2019 5:03 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668864	Due:	Aug 2, 2019
Project Name:	ADDITIONAL	Phone:	02 9954 8118	Priority:	2 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell
Eurofins Analytical Services Manager : Andrew Black					

Sample Detail				Lead	AUS Leaching Procedure	USA Leaching Procedure
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217				X	X	X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
			Water			
Test Counts				6	3	3

Internal Quality Control Review and Glossary
General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test				Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code		
Method Blank											
Heavy Metals											
Lead				mg/L	< 0.01		0.01	Pass			
LCS - % Recovery											
Heavy Metals											
Lead				%	84		70-130	Pass			
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code		
Spike - % Recovery											
Heavy Metals											
Lead				S19-JI50745	CP	%	92	70-130	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code		
Duplicate											
Heavy Metals											
Lead				S19-JI50740	CP	mg/L	4.3	4.1	6.0	30%	Pass
Duplicate											
Heavy Metals											
Lead				S19-JI50743	CP	mg/L	1.1	0.92	15	30%	Pass

Comments
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other

Authorised By

Andrew Black	Analytical Services Manager
Gabriele Cordero	Senior Analyst-Metal (NSW)


**Glenn Jackson
General Manager**

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Enviro Sample NSW

To: Andrew Black
Subject: RE: 2 DAY TAT ADDITIONAL LEACHATES: FW: Eurofins Test Results, Invoice - Report 668044 : Site 318000780

From: Stephen Maxwell [<mailto:SMAXWELL@ramboll.com>]
Sent: Wednesday, 31 July 2019 5:03 PM
To: Andrew Black
Cc: Joshua Blackwell; Anand Chandra; Nibha Vaidya
Subject: RE: Eurofins Test Results, Invoice - Report 668044 : Site 318000780

EXTERNAL EMAIL*

Thanks Andrew

Very much appreciated. Can we commission the following additional leachate analyses to have data in hand before COB Friday?

TCLP prep followed by lead analyses on:

- TP1 0.1-0.5,
- TP5 0.1-0.45 and
- TP7 0.1-0.4

ASLP prep followed by lead analyses on:

- TP3_ 0.1-0.5,
- SS20 0-0.1,
- TP4 0.1-0.3

Kind regards

Stephen Maxwell
Lead Consultant

D +61 478658194
M +61 478658194
smaxwell@ramboll.com

Ramboll Australia Pty Ltd.
ACN 095 437 442
ABN 49 095 437 442

From: AndrewBlack@eurofins.com <AndrewBlack@eurofins.com>
Sent: 31 July, 2019 4:34 PM
To: Stephen Maxwell <SMAXWELL@ramboll.com>
Cc: &AsiaPac-Accounts <asiapac-accounts@ramboll.com>; Joshua Blackwell <JBLACKWELL@ramboll.com>
Subject: Eurofins Test Results, Invoice - Report 668044 : Site 318000780

Regards

Andrew Black
Analytical Services Manager

Eurofins | Environment Testing

Unit 7
7 Friesian Close
SANDGATE NSW 2304
AUSTRALIA
Phone: +61 299 008 490
Mobile: +61 410 220 750

Email: AndrewBlack@eurofins.com

Website: environment.eurofins.com.au

[EnviroNote 1079 - PFAS Fingerprinting](#)

[EnviroNote 1080 - Total Organofluorine Analysis & PFAS Investigations](#)

Click [here](#) to report this email as spam.

ScannedByWebsenseForEurofins

* WARNING - EXTERNAL: This email originated from outside of Eurofins. Do not click any links or open any attachments unless you trust the sender and know that the content is safe!

Melbourne

6 Monterey Road
Dandenong South Vic 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney

Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane

1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth

2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

Sample Receipt Advice

Company name: **Ramboll Australia Pty Ltd**
Contact name: Stephen Maxwell
Project name: ADDITIONAL
Project ID: 318000780
COC number: Not provided
Turn around time: 2 Day
Date/Time received: Jul 31, 2019 5:03 PM
Eurofins reference: **668864**

Sample information

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- All samples have been received as described on the above COC.
- COC has been completed correctly.
- Attempt to chill was evident.
- Appropriately preserved sample containers have been used.
- All samples were received in good condition.
- Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- Appropriate sample containers have been used.
- Split sample sent to requested external lab.
- Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Andrew Black on Phone : (+61) 2 9900 8490 or by e.mail: AndrewBlack@eurofins.com

Results will be delivered electronically via e.mail to Stephen Maxwell - smaxwell@ramboll.com.

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 31, 2019 5:03 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668864	Due:	Aug 2, 2019
Project Name:	ADDITIONAL	Phone:	02 9954 8118	Priority:	2 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Lead	AUS Leaching Procedure	USA Leaching Procedure
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	TP1 0.1-0.5	Jul 26, 2019		US Leachate	S19-JI50740	X		X
2	TP5 0.1-0.45	Jul 26, 2019		US Leachate	S19-JI50741	X		X
3	TP7 0.1-0.4	Jul 26, 2019		US Leachate	S19-JI50742	X		X
4	TP3 0.1-0.5	Jul 26, 2019		AUS Leachate - Reagent Water	S19-JI50743	X	X	
5	SS20 0-0.1	Jul 26, 2019		AUS Leachate - Reagent Water	S19-JI50744	X	X	
6	TP4 0.1-0.3	Jul 26, 2019		AUS Leachate - Reagent	S19-JI50745	X	X	

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 31, 2019 5:03 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668864	Due:	Aug 2, 2019
Project Name:	ADDITIONAL	Phone:	02 9954 8118	Priority:	2 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail					Lead	AUS Leaching Procedure	USA Leaching Procedure
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217					X	X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
				Water			
Test Counts					6	3	3



Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 222573

Client Details

Client	Ramboll Australia Pty Ltd
Attention	Stephen Maxwell
Address	PO Box 560, North Sydney, NSW, 2060

Sample Details

Your Reference	<u>318000780</u>
Number of Samples	2 Soil
Date samples received	29/07/2019
Date completed instructions received	29/07/2019

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	30/07/2019
Date of Issue	30/07/2019
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By

Jaimie Loa-Kum-Cheung, Metals Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

Acid Extractable metals in soil			
Our Reference		222573-1	222573-2
Your Reference	UNITS	T02_260719	T03_260719
Date Sampled		26/07/2019	26/07/2019
Type of sample		Soil	Soil
Date prepared	-	29/07/2019	29/07/2019
Date analysed	-	29/07/2019	29/07/2019
Lead	mg/kg	260	24

Moisture			
Our Reference		222573-1	222573-2
Your Reference	UNITS	T02_260719	T03_260719
Date Sampled		26/07/2019	26/07/2019
Type of sample		Soil	Soil
Date prepared	-	29/07/2019	29/07/2019
Date analysed	-	30/07/2019	30/07/2019
Moisture	%	2.1	5.9

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			29/07/2019	[NT]	[NT]	[NT]	[NT]	29/07/2019	[NT]
Date analysed	-			29/07/2019	[NT]	[NT]	[NT]	[NT]	29/07/2019	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

CHAIN OF CUSTODY RECORD

ABN 50 005 005 521

Sydney Laboratory
Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9500 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1, 21 Smallwood Pl., Murarie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Ramboll		Project No	318000780		Project Manager	Stephen Maxwell		Sampler(s)	SM and SC		
Address	50 Glebe Road the Junction		Project Name			EDD Format (ESdat, EQUS, Custom)	Excel and PDF		Handed over by	Stephen Maxwell		
Contact Name	Stephen Maxwell		Analyses (Note: Where multiple analyses are required, please specify 'matrix' or 'filter' or 'suite'. Each must be used to accept SQA/SQE practice)	Lead		Envirolab Services 12 Ashley St Chatswood NSW 2067 Ph: (02) 9910 6200 Job No: 222543 Date Received: 29/07/19 Time Received: 12:56 Received by: [Signature] Temp: Cool/Ambient Cooling: Ice/Icepack Security: Intact/Broken/None		Email for Invoice	smaxwell@ramboll.com asiapac-accounts@ramboll.com			
Phone No	0478 658 194							Email for Results	smaxwell@ramboll.com cgoodbody@ramboll.com			
Special Directions								Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)		<input type="checkbox"/> Overnight (9am)* <input checked="" type="checkbox"/> 1 Day* <input type="checkbox"/> 2 Day* <input type="checkbox"/> 3 Day* <input type="checkbox"/> 5 Day* <input type="checkbox"/> Other () * Surcharges apply		
Purchase Order								Containers		1L Plastic 250mL Plastic 125mL Plastic 200mL Amber Glass 40mL VOA vial 500mL PFAS Bottle Jar (Glass or HDPE) Other (Subsides, Isobutyl, WA Substitutes)		
Quote ID No	180813RAMN_1							Sample Comments / Dangerous Goods Hazard Warning				
No	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))									
1	SS12_0-0.1	26/07/19	S	X								
2	SS13_0-0.1	26/07/19	S	X								
3	SS14_0-0.1	26/07/19	S	X								
4	SS15_0-0.1	26/07/19	S	X								
5	SS16_0-0.1	26/07/19	S	X								
6												
7	D02_260719	26/07/19	S	X								
8	D03_260719	26/07/19	S	X								
9	T02_260719	26/07/19	S	X						Please send to Envirolab for analysis		
10	T03_260719	26/07/19	S	X						Please send to Envirolab for analysis		
Total Counts				9								
Method of Shipment	<input type="checkbox"/> Courier (#) <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		Name			Signature			Date			
Received By	[Signature]		Date	29/07/19		Time	5:54 PM		Temperature	16.70C		
Received By	[Signature]		Date	29/07/19		Time	2:20 PM		Temperature	[Blank]		

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

Melbourne

6 Monterey Road
Dandenong South Vic 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney

Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane

1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth

2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

Sample Receipt Advice

Company name: **Ramboll Australia Pty Ltd**

Contact name: Stephen Maxwell

Project ID: 318000780

COC number: Not provided

Turn around time: 1 Day

Date/Time received: Aug 14, 2019 9:43 AM

Eurofins reference: **670968**

Sample information

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- All samples have been received as described on the above COC.
- COC has been completed correctly.
- Attempt to chill was evident.
- Appropriately preserved sample containers have been used.
- All samples were received in good condition.
- Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- Appropriate sample containers have been used.
- Sample containers for volatile analysis received with zero headspace.
- Split sample sent to requested external lab.
- Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

T01_120819 and T02_120819 (1 jar each) sent to ALS.

Contact notes

If you have any questions with respect to these samples please contact:

Alena Bounkeua on Phone : or by e.mail: AlenaBounkeua@eurofins.com

Results will be delivered electronically via e.mail to Stephen Maxwell - smaxwell@ramboll.com.

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Aug 14, 2019 9:43 AM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	670968	Due:	Aug 15, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Aluminium (filtered)	Barium (filtered)	Beryllium (filtered)	Cobalt (filtered)	Conductivity (at 25°C)	Iron (filtered)	Lead	Manganese (filtered)	pH (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Suspended Solids Dried at 103--105°C	Turbidity	Moisture Set	Eurofins mg/L Suite B6 (filtered metals)	BTEXN and Volatile TRH	Eurofins mg/L Suite B19D: Total N, TKN, NOx, NO2, NO3, Total P		
Melbourne Laboratory - NATA Site # 1254 & 14271																					X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794																							
Perth Laboratory - NATA Site # 23736																							
External Laboratory																							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID																		
1	S03 UP	Aug 13, 2019		Water	S19-Au17273	X	X	X	X	X	X		X	X	X	X	X		X		X		
2	SS23	Aug 12, 2019		Soil	S19-Au17274							X						X					
3	SS24	Aug 12, 2019		Soil	S19-Au17275							X						X					
4	SS25	Aug 12, 2019		Soil	S19-Au17276							X						X					
5	SS26	Aug 12, 2019		Soil	S19-Au17277							X						X					
6	SS27	Aug 12, 2019		Soil	S19-Au17278							X						X					
7	SS28	Aug 12, 2019		Soil	S19-Au17279							X						X					
8	SS29	Aug 12, 2019		Soil	S19-Au17280							X						X					
9	SS30	Aug 12, 2019		Soil	S19-Au17281							X						X					

Company Name: Ramboll Australia Pty Ltd	Order No.:	Received: Aug 14, 2019 9:43 AM
Address: Level 3/100 Pacific Highway North Sydney NSW 2060	Report #: 670968	Due: Aug 15, 2019
	Phone: 02 9954 8118	Priority: 1 Day
	Fax: 02 9954 8150	Contact Name: Stephen Maxwell
Project Name:		
Project ID: 318000780		

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail			Aluminium (filtered)	Barium (filtered)	Beryllium (filtered)	Cobalt (filtered)	Conductivity (at 25°C)	Iron (filtered)	Lead	Manganese (filtered)	pH (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Suspended Solids Dried at 103–105°C	Turbidity	Moisture Set	Eurofins mg/L Suite B6 (filtered metals)	BTEXN and Volatile TRH	Eurofins mg/L Suite B19D: Total N, TKN, NOx, NO2, NO3, Total P
Melbourne Laboratory - NATA Site # 1254 & 14271																		X
Sydney Laboratory - NATA Site # 18217			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
10	D01_120819	Aug 12, 2019							X						X			
11	D02_120819	Aug 12, 2019							X						X			
12	D01_130819	Aug 12, 2019	X	X	X	X	X	X		X	X	X	X	X		X		X
13	SPIKE	Aug 12, 2019															X	
14	BLANK	Aug 12, 2019															X	
Test Counts			2	2	2	2	2	2	10	2	2	2	2	2	10	2	2	2

Ramboll Environ Australia Pty Ltd
 Level 3/100 Pacific Highway
 North Sydney
 NSW 2060



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Stephen Maxwell**

Report **670968-S**
 Project name
 Project ID **318000780**
 Received Date **Aug 13, 2019**

Client Sample ID			SS23	SS24	SS25	SS26
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au17274	S19-Au17275	S19-Au17276	S19-Au17277
Date Sampled			Aug 12, 2019	Aug 12, 2019	Aug 12, 2019	Aug 12, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	350	3000	11000	33
% Moisture	1	%	1.7	3.3	4.9	2.7

Client Sample ID			SS27	SS28	SS29	SS30
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au17278	S19-Au17279	S19-Au17280	S19-Au17281
Date Sampled			Aug 12, 2019	Aug 12, 2019	Aug 12, 2019	Aug 12, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	6700	12000	3700	470
% Moisture	1	%	6.7	5.7	3.9	3.5

Client Sample ID			D01_120819	D02_120819
Sample Matrix			Soil	Soil
Eurofins Sample No.			S19-Au17282	S19-Au17283
Date Sampled			Aug 12, 2019	Aug 12, 2019
Test/Reference	LOR	Unit		
Heavy Metals				
Lead	5	mg/kg	13000	570
% Moisture	1	%	6.1	4.4

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Aug 13, 2019	180 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	Aug 13, 2019	14 Days

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Aug 14, 2019 9:43 AM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	670968	Due:	Aug 15, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Aluminium (filtered)	Barium (filtered)	Beryllium (filtered)	Cobalt (filtered)	Conductivity (at 25°C)	Iron (filtered)	Lead	Manganese (filtered)	pH (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Suspended Solids Dried at 103–105°C	Turbidity	Moisture Set	Eurofins mg/L Suite B6 (filtered metals)	BTEXN and Volatile TRH	Eurofins mg/L Suite B19D: Total N, TKN, NOx, NO2, NO3, Total P	
Melbourne Laboratory - NATA Site # 1254 & 14271																					X	
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																						
Perth Laboratory - NATA Site # 23736																						
External Laboratory																						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID																	
1	S03 UP	Aug 13, 2019		Water	S19-Au17273	X	X	X	X	X	X		X	X	X	X	X		X		X	
2	SS23	Aug 12, 2019		Soil	S19-Au17274							X						X				
3	SS24	Aug 12, 2019		Soil	S19-Au17275							X						X				
4	SS25	Aug 12, 2019		Soil	S19-Au17276							X						X				
5	SS26	Aug 12, 2019		Soil	S19-Au17277							X						X				
6	SS27	Aug 12, 2019		Soil	S19-Au17278							X						X				
7	SS28	Aug 12, 2019		Soil	S19-Au17279							X						X				
8	SS29	Aug 12, 2019		Soil	S19-Au17280							X						X				
9	SS30	Aug 12, 2019		Soil	S19-Au17281							X						X				

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Aug 14, 2019 9:43 AM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	670968	Due:	Aug 15, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Aluminium (filtered)	Barium (filtered)	Beryllium (filtered)	Cobalt (filtered)	Conductivity (at 25°C)	Iron (filtered)	Lead	Manganese (filtered)	pH (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Suspended Solids Dried at 103–105°C	Turbidity	Moisture Set	Eurofins mg/L Suite B6 (filtered metals)	BTEXN and Volatile TRH	Eurofins mg/L Suite B19D: Total N, TKN, NOx, NO2, NO3, Total P	
Melbourne Laboratory - NATA Site # 1254 & 14271																					X	
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																						
Perth Laboratory - NATA Site # 23736																						
10	D01_120819	Aug 12, 2019		Soil	S19-Au17282							X						X				
11	D02_120819	Aug 12, 2019		Soil	S19-Au17283							X						X				
12	D01_130819	Aug 12, 2019		Water	S19-Au17284	X	X	X	X	X	X		X	X	X	X			X		X	
13	SPIKE	Aug 12, 2019		Water	S19-Au17285															X		
14	BLANK	Aug 12, 2019		Water	S19-Au17286															X		
Test Counts						2	2	2	2	2	2	10	2	2	2	2	2	10	2	2	2	

Internal Quality Control Review and Glossary
General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test				Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code			
Method Blank												
Heavy Metals												
Lead				mg/kg	< 5		5	Pass				
LCS - % Recovery												
Heavy Metals												
Lead				%	104		70-130	Pass				
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code			
Spike - % Recovery												
Heavy Metals												
Lead				S19-Au11644	NCP	%	102	70-130	Pass			
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code			
Duplicate												
Heavy Metals												
Lead				S19-Au17274	CP	mg/kg	350	380	6.0	30%	Pass	
Duplicate												
					Result 1	Result 2	RPD					
% Moisture				S19-Au17274	CP	%	1.7	1.2	35	30%	Fail	Q15

Comments
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q15	The RPD reported passes Eurofins mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Alena Bounkeua	Analytical Services Manager
Gabriele Cordero	Senior Analyst-Metal (NSW)


**Glenn Jackson
General Manager**

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.



CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

Sydney Laboratory
 Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2056
 02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
 Unit 1, 21 Smallwood Pl., Murarie, QLD 4172
 07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
 Unit 2, 91 Leach Highway, Kewdale WA 6105
 08 9251 9600 EnviroSampleWA@eurofins.com

Melbourne Laboratory
 2 Kingston Town Close, Oakleigh, VIC 3166
 03 8564 5000 EnviroSampleVic@eurofins.com

Company		RAMBOLL		Project No		318000780		Project Manager		STEVE MAXWELL		
Address		6685 RD THE JUNCTION NSW 2291		Project Name		-		Report Format		PDF & EXCEL		
Contact Name		STEVE MAXWELL		Relinquished by		STEVE MAXWELL		Email for Results		smaxwell@ramboll.com		
Phone No		0478658194		Containers		Turn Around Requirements		1L Plastic		<input type="checkbox"/> Overnight (9am)* <input checked="" type="checkbox"/> 1 Day* <input type="checkbox"/> 2 Day* <input type="checkbox"/> 3 Day* <input type="checkbox"/> 5 Day* <input type="checkbox"/> Other ()		
Special Direction		SOIL MAT		Analysis		(Note: Where matrix are requested, please specify "Total" or "Filtered") PH GREEN METALS (D.SOURCE) PH EC, TDS, RSSTURBIDITY LEAD		250mL Plastic		<input type="checkbox"/> * Surcharges apply		
Purchase Order		-		40mL vial				125mL Amber Glass				
Quote ID No				Other ()				125mL Amber Glass				
No	Client Sample ID	Date	Matrix	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Other ()	Sample Comments / DG Hazard Warning	
1	SS 03 UP	13/8/19	WATER									
2	SS 23	12/8/19	SOIL									
3	SS 24	↓										
4	SS 25											
5	SS 26											
6	SS 27											
7	SS 28											
8	SS 29											
9	SS 30											
10	DOE-120819											
Total Counts												
Method of Shipment			<input type="checkbox"/> Courier (#) <input type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		Name		Signature		Date		Time	
Laboratory Use Only		Received By <i>Grave Turnell</i>		SYD BNE MEL PER ADL NEW DAR		Signature <i>[Signature]</i>		Date <i>13.8.19</i>		Time <i>12.13</i>		
		Received By		SYD BNE MEL PER ADL NEW DAR		Signature		Date		Temperature <i>6.87</i>		
										Report No <i>670968</i>		

P1/2



CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

Sydney Laboratory
Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9500 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1, 21 Smallwood Pl., Murarie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company		Project No		Project Manager		Relinquished by	
Address		Project Name		Report Format		Email for Results	
Contact Name		Analysis <small>(Note where multiple are requested, please specify "Total" or "Element")</small>				Containers	
Phone No						Turn Around Requirements	
Special Direction						<input type="checkbox"/> Overnight (9am)* <input type="checkbox"/> 1 Day* <input type="checkbox"/> 2 Day* <input type="checkbox"/> 3 Day* <input type="checkbox"/> 5 Day* <input type="checkbox"/> Other ()	
Purchase Order						Sample Comments / DG Hazard Warning	
Quote ID No							
No	Client Sample ID	Date	Matrix	TRH	BTEX	LEAD	Other ()
1	TOE-120819	12/8/19	SOIL			X	
2	DO2-120819	↓	↓			X	
3	TO2-120819	↓	↓			X	
4	DO1-130819	13/8/19	WATER	X			
5	SPIKE		WATER		X		
6	BANK		WATER		X		
7							
8							
9							
10							
Total Counts							
Method of Shipment		Name		Signature		Date	
<input type="checkbox"/> Courier (#) <input type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal							
Received By <i>Grace Turnbull</i>		<input checked="" type="checkbox"/> SYD BNE MEL PER ADL NEW DAR		<i>Grace Turnbull</i>		Date <u>13/8/19</u> Time <u>12:13</u>	
Received By		SYD BNE MEL PER ADL NEW DAR		Signature		Date Time Report No <u>670968</u>	

P2/2

CERTIFICATE OF ANALYSIS

Work Order : **ES1925785**
Client : **RAMBOLL AUSTRALIA PTY LTD**
Contact : Steve Maxwell
Address : Eastpoint Complex | Suite 19B, Level 2 50 Glebe Road PO Box
 435
 THE JUNCTION NSW 2291
Telephone : ----
Project : 318000780
Order number :
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : EN/222
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 2
Laboratory : Environmental Division Sydney
Contact : Sepan Mahamad
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61 2 8784 8555
Date Samples Received : 14-Aug-2019 14:10
Date Analysis Commenced : 14-Aug-2019
Issue Date : 15-Aug-2019 19:21



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Evie Sidarta	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

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

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				T01_120819	T02_120819	----	----	----
Client sampling date / time				12-Aug-2019 00:00	12-Aug-2019 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES1925785-001	ES1925785-002	-----	-----	-----
				Result	Result	---	---	---
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	6.7	4.0	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Lead	7439-92-1	5	mg/kg	15000	405	----	----	----

QUALITY CONTROL REPORT

Work Order	: ES1925785	Page	: 1 of 3
Client	: RAMBOLL AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: Steve Maxwell	Contact	: Sepan Mahamad
Address	: Eastpoint Complex Suite 19B, Level 2 50 Glebe Road PO Box 435 THE JUNCTION NSW 2291	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: 318000780	Date Samples Received	: 14-Aug-2019
Order number	:	Date Analysis Commenced	: 14-Aug-2019
C-O-C number	: ----	Issue Date	: 15-Aug-2019
Sampler	: ----		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 2		
No. of samples analysed	: 2		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Evie Sidarta	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

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

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				<i>Laboratory Duplicate (DUP) Report</i>					
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD (%)</i>	<i>Recovery Limits (%)</i>
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2524601)									
ES1924978-015	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	37	45	18.7	No Limit
ES1924978-047	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	17	23	30.8	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2524603)									
ES1924978-018	Anonymous	EA055: Moisture Content	----	0.1	%	22.6	22.7	0.00	0% - 20%
ES1924978-054	Anonymous	EA055: Moisture Content	----	0.1	%	5.4	5.0	6.86	No Limit



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

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

Sub-Matrix: SOIL

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2524601)								
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	100	80	114

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2524601)							
ES1924978-015	Anonymous	EG005T: Lead	7439-92-1	250 mg/kg	80.8	70	130



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES1925785	Page	: 1 of 4
Client	: RAMBOLL AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: Steve Maxwell	Telephone	: +61 2 8784 8555
Project	: 318000780	Date Samples Received	: 14-Aug-2019
Site	: ----	Issue Date	: 15-Aug-2019
Sampler	: ----	No. of samples received	: 2
Order number	:	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**



Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055) T01_120819,	T02_120819	12-Aug-2019	----	----	----	14-Aug-2019	26-Aug-2019	✓
EG005(ED093)T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T) T01_120819,	T02_120819	12-Aug-2019	14-Aug-2019	08-Feb-2020	✓	15-Aug-2019	08-Feb-2020	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)

Melbourne

6 Monterey Road
Dandenong South Vic 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney

Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane

1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth

2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

Sample Receipt Advice

Company name: **Ramboll Australia Pty Ltd**

Contact name: **Stephen Maxwell**

Project name: **318000780**

COC number: **Not provided**

Turn around time: **1 Day**

Date/Time received: **Aug 27, 2019 5:45 PM**

Eurofins reference: **673583**

Sample information

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- All samples have been received as described on the above COC.
- COC has been completed correctly.
- Attempt to chill was evident.
- Appropriately preserved sample containers have been used.
- All samples were received in good condition.
- Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- Appropriate sample containers have been used.
- Split sample sent to requested external lab.
- Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Samples; TO1_270819 (1xJar) and TO2_270819 (1xJar) forwarded to ALS. SS36 sample not received, analysis cancelled.

Contact notes

If you have any questions with respect to these samples please contact:

Andrew Black on Phone : (+61) 2 9900 8490 or by e.mail: AndrewBlack@eurofins.com

Results will be delivered electronically via e.mail to Stephen Maxwell - smaxwell@ramboll.com.

Company Name: Ramboll Australia Pty Ltd	Order No.:	Received: Aug 27, 2019 5:45 PM
Address: Level 3/100 Pacific Highway North Sydney NSW 2060	Report #: 673583	Due: Aug 28, 2019
Project Name: 318000780	Phone: 02 9954 8118	Priority: 1 Day
	Fax: 02 9954 8150	Contact Name: Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						CANCELLED	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	SS30	Aug 27, 2019		Soil	S19-Au39075		X	X
2	SS31	Aug 27, 2019		Soil	S19-Au39076		X	X
3	SS32	Aug 27, 2019		Soil	S19-Au39077		X	X
4	SS33	Aug 27, 2019		Soil	S19-Au39078		X	X
5	SS34	Aug 27, 2019		Soil	S19-Au39079		X	X
6	SS35	Aug 27, 2019		Soil	S19-Au39080		X	X
7	SS36	Aug 27, 2019		Soil	S19-Au39081	X		
8	SS37	Aug 27, 2019		Soil	S19-Au39082		X	X
9	SS38	Aug 27, 2019		Soil	S19-Au39083		X	X
10	SS39	Aug 27, 2019		Soil	S19-Au39084		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Aug 27, 2019 5:45 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	673583	Due:	Aug 28, 2019
Project Name:	318000780	Phone:	02 9954 8118	Priority:	1 Day
		Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						CANCELLED	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
11	SS40	Aug 27, 2019		Soil	S19-Au39085		X	X
12	SS41	Aug 27, 2019		Soil	S19-Au39086		X	X
13	SS42	Aug 27, 2019		Soil	S19-Au39087		X	X
14	SS43	Aug 27, 2019		Soil	S19-Au39088		X	X
15	SS44	Aug 27, 2019		Soil	S19-Au39089		X	X
16	SS45	Aug 27, 2019		Soil	S19-Au39090		X	X
17	SS46	Aug 27, 2019		Soil	S19-Au39091		X	X
18	SS47	Aug 27, 2019		Soil	S19-Au39092		X	X
19	SS48	Aug 27, 2019		Soil	S19-Au39093		X	X
20	SS49	Aug 27, 2019		Soil	S19-Au39094		X	X
21	SS50	Aug 27, 2019		Soil	S19-Au39095		X	X
22	SS51	Aug 27, 2019		Soil	S19-Au39096		X	X
23	D01_270819	Aug 27, 2019		Soil	S19-Au39097		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Aug 27, 2019 5:45 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	673583	Due:	Aug 28, 2019
Project Name:	318000780	Phone:	02 9954 8118	Priority:	1 Day
		Fax:	02 9954 8150	Contact Name:	Stephen Maxwell
					Eurofins Analytical Services Manager : Andrew Black

Sample Detail						CANCELLED	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
24	D02_270819	Aug 27, 2019		Soil	S19-Au39098		X	X
Test Counts						1	23	23

Ramboll Environ Australia Pty Ltd
 Level 3/100 Pacific Highway
 North Sydney
 NSW 2060



NATA Accredited
 Accreditation Number 1261
 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Stephen Maxwell**

Report **673583-S**
 Project name **318000780**
 Received Date **Aug 27, 2019**

Client Sample ID			SS30	SS31	SS32	SS33
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au39075	S19-Au39076	S19-Au39077	S19-Au39078
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	2100	710	2400	800
% Moisture	1	%	2.4	1.5	2.2	3.8

Client Sample ID			SS34	SS35	SS37	SS38
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au39079	S19-Au39080	S19-Au39082	S19-Au39083
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	850	900	1600	9900
% Moisture	1	%	1.7	2.4	1.8	1.8

Client Sample ID			SS39	SS40	SS41	SS42
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au39084	S19-Au39085	S19-Au39086	S19-Au39087
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	2900	2600	11000	240
% Moisture	1	%	1.2	2.3	3.0	4.8

Client Sample ID			SS43	SS44	SS45	SS46
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au39088	S19-Au39089	S19-Au39090	S19-Au39091
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	31000	140	4000	210
% Moisture						
	1	%	7.5	8.7	6.1	9.6

Client Sample ID			SS47	SS48	SS49	SS50
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au39092	S19-Au39093	S19-Au39094	S19-Au39095
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	3900	1800	1400	1400
% Moisture						
	1	%	7.4	6.9	5.9	7.3

Client Sample ID			SS51	D01_270819	D02_270819
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S19-Au39096	S19-Au39097	S19-Au39098
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit			
Heavy Metals					
Lead	5	mg/kg	190	2800	230
% Moisture					
	1	%	3.0	2.6	4.8

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description

Heavy Metals

- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS

% Moisture

- Method: LTM-GEN-7080 Moisture

Testing Site

Sydney

Sydney

Extracted

Aug 27, 2019

Aug 27, 2019

Holding Time

180 Days

14 Days

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Aug 27, 2019 5:45 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	673583	Due:	Aug 28, 2019
Project Name:	318000780	Phone:	02 9954 8118	Priority:	1 Day
		Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						CANCELLED	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	SS30	Aug 27, 2019		Soil	S19-Au39075		X	X
2	SS31	Aug 27, 2019		Soil	S19-Au39076		X	X
3	SS32	Aug 27, 2019		Soil	S19-Au39077		X	X
4	SS33	Aug 27, 2019		Soil	S19-Au39078		X	X
5	SS34	Aug 27, 2019		Soil	S19-Au39079		X	X
6	SS35	Aug 27, 2019		Soil	S19-Au39080		X	X
7	SS36	Aug 27, 2019		Soil	S19-Au39081	X		
8	SS37	Aug 27, 2019		Soil	S19-Au39082		X	X
9	SS38	Aug 27, 2019		Soil	S19-Au39083		X	X
10	SS39	Aug 27, 2019		Soil	S19-Au39084		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Aug 27, 2019 5:45 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	673583	Due:	Aug 28, 2019
Project Name:	318000780	Phone:	02 9954 8118	Priority:	1 Day
		Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						CANCELLED	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
11	SS40	Aug 27, 2019		Soil	S19-Au39085		X	X
12	SS41	Aug 27, 2019		Soil	S19-Au39086		X	X
13	SS42	Aug 27, 2019		Soil	S19-Au39087		X	X
14	SS43	Aug 27, 2019		Soil	S19-Au39088		X	X
15	SS44	Aug 27, 2019		Soil	S19-Au39089		X	X
16	SS45	Aug 27, 2019		Soil	S19-Au39090		X	X
17	SS46	Aug 27, 2019		Soil	S19-Au39091		X	X
18	SS47	Aug 27, 2019		Soil	S19-Au39092		X	X
19	SS48	Aug 27, 2019		Soil	S19-Au39093		X	X
20	SS49	Aug 27, 2019		Soil	S19-Au39094		X	X
21	SS50	Aug 27, 2019		Soil	S19-Au39095		X	X
22	SS51	Aug 27, 2019		Soil	S19-Au39096		X	X
23	D01_270819	Aug 27, 2019		Soil	S19-Au39097		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Aug 27, 2019 5:45 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	673583	Due:	Aug 28, 2019
Project Name:	318000780	Phone:	02 9954 8118	Priority:	1 Day
		Fax:	02 9954 8150	Contact Name:	Stephen Maxwell
Eurofins Analytical Services Manager : Andrew Black					

Sample Detail						CANCELLED	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
24	D02_270819	Aug 27, 2019		Soil	S19-Au39098		X	X
Test Counts						1	23	23

Internal Quality Control Review and Glossary
General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
Method Blank											
Heavy Metals											
Lead				mg/kg	< 5			5	Pass		
LCS - % Recovery											
Heavy Metals											
Lead				%	128			70-130	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code		
Spike - % Recovery											
Heavy Metals											
Lead				S19-Au30488	NCP	%	120		70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code		
Duplicate											
Heavy Metals											
Lead				S19-Au39083	CP	mg/kg	9900	9500	4.0	30%	Pass
Duplicate											
Heavy Metals											
% Moisture				S19-Au39084	CP	%	1.2	1.6	27	30%	Pass
Duplicate											
Heavy Metals											
Lead				S19-Au39094	CP	mg/kg	1400	1300	4.0	30%	Pass
Duplicate											
Heavy Metals											
% Moisture				S19-Au39094	CP	%	5.9	6.7	13	30%	Pass

Comments**Sample Integrity**

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Andrew Black Analytical Services Manager
Gabriele Cordero Senior Analyst-Metal (NSW)

**Glenn Jackson
General Manager**

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.



CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

Sydney Laboratory

Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory

Unit 1 21 Smallwood Place Murarie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory

Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

Melbourne Laboratory

6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company RAMBOLL		Project No 318000780		Project Manager Stephan Maxwell		Sampler(s) S. Maxwell					
Address Level 2 50 Aurora Rd n/s junction		Project Name ---		EDD Format ESdat, EQUS etc CSU & PDF		Handed over by ---					
Contact Name Stephan Maxwell		Analyses Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing. LEAD				Email for Invoice smaxwell@ramboll.com					
Phone No 0478 658194						Email for Results ---					
Special Directions LDAY RFR						Containers Change container type & size if necessary.		Required Turnaround Time (TAT) Default will be 5 days if not ticked.			
Purchase Order ---						<input type="checkbox"/> 500mL Plastic <input type="checkbox"/> 250mL Plastic <input type="checkbox"/> 125mL Plastic <input type="checkbox"/> 200mL Amber Glass <input type="checkbox"/> 40mL VOA vial <input type="checkbox"/> 500mL PFAS Bottle <input type="checkbox"/> Jar (Glass or HDPE) Other (Asbestos AS4984, WA Guidelines)		<input type="checkbox"/> Overnight (reporting by 9am) ♦ <input type="checkbox"/> Same day ♦ <input type="checkbox"/> 1 day ♦ <input type="checkbox"/> 2 days ♦ <input type="checkbox"/> 3 days ♦ <input type="checkbox"/> 5 days (Standard) <input type="checkbox"/> Other()			
Quote ID No ---						Sample Comments / Dangerous Goods Hazard Warning					
No	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)								
1	SS30	27/8/19	soil								
2	↓	↓	↓								
3											
4											
5											
6				SS51							
7	DO1-270819										
8	DO1-270819							PLEASE SEND TO ALS			
9	DO2-270819										
10	DO2-270819							PLEASE SEND TO ALS			
Total Counts											
Method of Shipment		<input type="checkbox"/> Courier (#) <input type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		Name		Signature		Date		Time	
Laboratory Use Only		Received By Signature		BYD BNE MEL PER ADL NTL DRW		Signature Signature		Date 27/8/19		Time 5:45PM	
		Received By		SYD BNE MEL PER ADL NTL DRW		Signature		Date		Temperature 19.20°C	
										Report No 673583	

CERTIFICATE OF ANALYSIS

Work Order : **ES1927426**
Client : **RAMBOLL AUSTRALIA PTY LTD**
Contact : Steve Maxwell
Address : Eastpoint Complex | Suite 19B, Level 2 50 Glebe Road PO Box
 435
 THE JUNCTION NSW 2291
Telephone : ----
Project : 318000780
Order number :
C-O-C number : ----
Sampler : Steve Maxwell
Site : ----
Quote number : EN/222
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 2
Laboratory : Environmental Division Sydney
Contact : Sepan Mahamad
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61 2 8784 8555
Date Samples Received : 28-Aug-2019 14:25
Date Analysis Commenced : 28-Aug-2019
Issue Date : 29-Aug-2019 14:43



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Evie Sidarta	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

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

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				T01_270819	T02_270819	----	----	----
Client sampling date / time				27-Aug-2019 00:00	27-Aug-2019 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES1927426-001	ES1927426-002	-----	-----	-----
				Result	Result	---	---	---
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	2.6	4.4	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Lead	7439-92-1	5	mg/kg	2300	191	----	----	----

QUALITY CONTROL REPORT

Work Order	: ES1927426	Page	: 1 of 3
Client	: RAMBOLL AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: Steve Maxwell	Contact	: Sepan Mahamad
Address	: Eastpoint Complex Suite 19B, Level 2 50 Glebe Road PO Box 435 THE JUNCTION NSW 2291	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: 318000780	Date Samples Received	: 28-Aug-2019
Order number	:	Date Analysis Commenced	: 28-Aug-2019
C-O-C number	: ----	Issue Date	: 29-Aug-2019
Sampler	: Steve Maxwell		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 2		
No. of samples analysed	: 2		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

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

Signatories	Position	Accreditation Category
Evie Sidarta	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

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

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				<i>Laboratory Duplicate (DUP) Report</i>					
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD (%)</i>	<i>Recovery Limits (%)</i>
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2552073)									
ES1926544-013	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	8	9	0.00	No Limit
ES1927191-003	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	57	56	0.00	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2552074)									
ES1926893-003	Anonymous	EA055: Moisture Content	----	0.1	%	14.6	16.1	9.80	0% - 50%
ES1927426-001	T01_270819	EA055: Moisture Content	----	0.1	%	2.6	2.8	10.6	0% - 20%



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

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

Sub-Matrix: SOIL

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2552073)								
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	108	80	114

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2552073)							
ES1926544-013	Anonymous	EG005T: Lead	7439-92-1	250 mg/kg	94.5	70	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES1927426	Page	: 1 of 4
Client	: RAMBOLL AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: Steve Maxwell	Telephone	: +61 2 8784 8555
Project	: 318000780	Date Samples Received	: 28-Aug-2019
Site	: ----	Issue Date	: 29-Aug-2019
Sampler	: Steve Maxwell	No. of samples received	: 2
Order number	:	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**



Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055) T01_270819,	T02_270819	27-Aug-2019	----	----	----	28-Aug-2019	10-Sep-2019	✓
EG005(ED093)T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T) T01_270819,	T02_270819	27-Aug-2019	28-Aug-2019	23-Feb-2020	✓	29-Aug-2019	23-Feb-2020	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)

APPENDIX 6 SHORT TERM LEAD MANAGEMENT PLAN

Intended for
John Holland Rail

Document type
Management Plan

Date
September 2019

TARAGO LOOP EXTENSION SHORT-TERM LEAD MANAGEMENT PLAN

TARAGO LOOP EXTENSION SHORT-TERM LEAD MANAGEMENT PLAN

Project name **Tarago Crossing Loop Extension: Lead Management Plan**
Project no. **318000780**
Recipient **Wayne D'Souza**
Document type **Management Plan**
Report ref. **318000780-02**
Version **3**
Date **11/09/2019**
Prepared by **Anand Chandra**
Checked by **Stephen Maxwell**
Approved by **Fiona Robinson**
Description **The report describes short term management of lead contaminated material to be disturbed as part of the proposed Tarago loop extension**

Ramboll
Level 18
50 Glebe Road
PO Box 435The Junction
NSW 2291
Australia

T +61 2 4962 5444

<https://ramboll.com>

CONTENTS

1.	Introduction	2
1.1	Background	2
1.2	Operation of the SLMP	3
1.3	Objectives	3
2.	Lead management structure	4
2.1	Roles and Responsibilities	4
2.2	Legislative and Regulatory Framework	4
2.3	Periodic Review	5
2.4	Corrective Actions	5
2.5	Record Keeping	5
3.	Site Lead Mangement	6
3.1	Hazard Identification	6
3.2	Lead Management Strategy	6
3.3	Hazard Elimination	6
3.4	Material Tracking	8
3.5	Stockpile Management	9
3.6	Environmental Controls	9
3.6.1	Surface Water Monitoring	9
3.6.2	Air Monitoring	9
3.7	Post Hazard Elimination Activity	10
3.8	SafeWork NSW Requirements	10
3.9	Signal Trench Construction in Area of Lead Impact	10
3.10	Offsite Disposal	10
4.	Limitations	11
5.	References	12

APPENDICES

Appendix 1

SafeWork NSW Lead Notifcation Requirements

1. INTRODUCTION

1.1 Background

Ramboll Australia Pty Ltd (Ramboll) was commissioned by John Holland Rail (JHR) to prepare a Short-term Lead Management Plan (SLMP) for spoil to be generated during proposed extension of the Tarago Loop. The proposed construction footprint is here-in referred to as "the site" (see **Figure 1**).

Assessment of the degree and extent of lead within the proposed Tarago Loop was undertaken (refer Ramboll 2019) to inform associated risk and management measures required for the works. Ballast at the top of the Woodlawn Siding formation is impacted by lead (CH: 261.980 km to CH: 262.880 km) with a distinct area where much higher lead concentrations observed (CH: 262.090 km and CH: 262.700 km). Surface soils adjacent (west of) the Woodlawn Siding area also have concentrations exceeding the applicable HIL and EIL values.

Materials from the main and loop lines are expected to be disturbed as part of the loop extension during excavation and construction of a new turnout and track. Field XRF measurements of lead concentrations showed lead contamination within the main line is spread from approximately CH: 261.950 km to CH: 292.950 km. High lead exceedance areas in the main line generally correspond with high lead exceedances in the siding.

The proposed construction will involve the disturbance of contaminated ballast and adjacent soils, which may create lead laden dust. The proposed earthworks methodology is understood to include use of an excavator or grader to remove spoil progressively to the western (UP) side of the siding track. An excavator will then either shift the spoil off the siding track or load a dump truck and cart material to a stockpile area. A water cart will be available to mitigate dust generation. No personnel are required for this work.

The expected depth of excavation within the rail formation is 0.5 m deep, however may extend to 0.7 m below current surface levels. The volume of fouled ballast to be excavated from the rail formation is estimated at 1250m³ based on excavation dimensions 600 m long x 0.7 m deep x 3 m wide excavation (average of trapezoidal ballast formation). This estimate however does not allow for lead impacted soils adjacent the track or fines that may be generated during ancillary works (eg: restoration of drainage lines or reconditioning of the existing main and loop lines). The total volume of lead impacted material requiring remediation has been conservatively estimated at 2800m³.

Assuming a volume to mass ratio of 1m³:1.8T at a bulk density of 1.8 kg/m³ the mass of lead impacted material is estimated at 5000T.

To define management options the observed lead contamination is divided spatially into medium and high impact per the observed contaminant distribution¹. Lead distribution across the site is presented on **Figure 2, Appendix 1**.

A lead management plan is required to effectively manage exposure of this material to construction workers and the environment.

This SLMP has been prepared in accordance with the relevant legislation and industry standards, with reference to the *Guideline for the Preparation of Environmental Management Plans* (DIPNR 2004) and SafeWork NSW guidance.

¹ Medium impact materials are those with lead concentrations exceeding NEPM Health Investigation Level for lead (1500 mg/kg) but below the New Jersey Department of Environmental Protection (NJDEP) Acute Soil Exposure Guideline (4000 mg/kg), or for XRF samples, exceeding a conservative value of 1200 mg/kg but below the NJDEP Guidelines. High impact materials are those with lead concentrations exceeding 4000 mg/kg. While subject to further clarification it is considered likely that the New Jersey Department of Environmental Protection (NJDEP) Acute Soil Exposure Guideline will be an appropriate criteria for assessing risks to worker exposure when considering long term management options.

This SLMP is intended to mitigate risks to human health or the environment associated with exposure to lead that may occur during construction. A strategy for long term management of lead is required though not provided in this SLMP.

1.2 Operation of the SLMP

This SLMP has been prepared to provide lead management strategies for construction works at the Site involving any disturbance of the lead contaminated ballast layer and adjacent surface soils.

The requirements of this SLMP apply to any activity at the Site which may result in disturbance of the lead contaminated material.

This SLMP will remain in place until a longer-term plan is developed and implemented or until the Site has been remediated and validated.

1.3 Objectives

The objective of this SLMP is to provide short-term strategies to minimise and manage risks from exposure to lead containing material during the proposed construction. Specific objectives of this plan are to:

- Ensure the implementation of best practice in lead dust management
- Ensure compliance with legislation and internal JHR policies and procedures
- Manage health and environmental risks from short-term exposure to lead containing material

2. LEAD MANAGEMENT STRUCTURE

2.1 Roles and Responsibilities

All Site personnel (including JHR and its contractors) have a responsibility for protecting human health and the environment. The key roles and responsibilities for this SLMP are presented in **Table 2-1**. JHR is ultimately responsible for developing a process to ensure this SLMP is identified and implemented for works in the site.

Table 2-1: Roles and Responsibilities

Role	Responsibility
JHR Project Manager / Site Supervisor	<ul style="list-style-type: none"> To engage the consultants and contractors To ensure that all employees, contractors and consultants that commission or carry out work on the site are aware of the contents of this SLMP To ensure compliance to the requirements of this SLMP through surveillance and monitoring of consultants and contractors Undertake all stakeholder management including liaison with regulatory bodies and follow-up of all external complaints Provision of a copy of this SLMP to any future purchasers or occupiers of the Site and attach a copy of the document to the contract of sale / lease Maintains ultimate responsibility for the implementation of this SLMP for the Site Responsible for revisions and amendments to this SLMP if Site conditions change. Track all management of the revisions and amendments, and ensure amendments are communicated to all stakeholders Review effectiveness of this SLMP following any incident or any other event that suggests this SLMP is ineffective Ensure any site workers and contractors engaged in sub-surface activities at the Site are inducted on the requirements of this SLMP
All site personnel	<ul style="list-style-type: none"> To take reasonable care for their own health and safety and for the health and safety of their co-workers. With specific regard for this SLMP all workers have a responsibility to implement controls as relevant to their site duties and to report any non-conformances with this plan to the JHR Project Manager / Site Manager.
JHR health and safety representative	<ul style="list-style-type: none"> Monitor and report (where relevant) on environmental and safety hazards, impacts or improvements to work activities. Immediate reporting of all non-conformances or complaints to JHR or concerns regarding the implementation of this SLMP Undertake corrective actions to rectify non-conformances or complaints
Environmental Representative	<ul style="list-style-type: none"> Provide advice on environmental issues and incidents as necessary Undertake monitoring and reporting requirements outlined in this SLMP Update this SLMP as necessary

2.2 Legislative and Regulatory Framework

This SLMP has been prepared to address the requirements of relevant legislation and codes. The key pieces of legislation applicable to this SLMP are:

- *NSW Work Health and Safety Act 2011*
- *NSW Work Health and Regulation 2017*
- *Protection of the Environment Operations Act 1997*

- *Protection of the Environment Operations (Waste) Regulation 2014*
- *Contaminated Land Management Act 1997*

The key codes of practice are:

- SafeWork NSW Lead Guidance
- SafeWork Australia Code of Practice Managing Risks of Hazardous Chemicals in the Workplace
- NSW EPA LeadSmart – Work Smart: Tradespeople and Mining Industry Workers
- NHMRC Managing Individual Exposure to Lead in Australia – A Guide for Health Practitioners 2016
- Workplace Exposure Standards for Airborne Contaminants (SafeWork NSW 2018)

2.3 Periodic Review

This SLMP must be reviewed routinely from date of issue or when:

- Requested by a health and safety representative from JHR
- Lead containing material is removed, disturbed, sealed or enclosed
- Changes to land use occur
- When a longer-term lead management plan is in place
- At least annually

2.4 Corrective Actions

Where corrective actions are identified as required to be undertaken by any onsite personnel, these must be communicated to the Site Supervisor and JHR. Corrective actions should be administered by the JHR Site Supervisor / Project Manager. Where the actions relate to breaches in environmental controls, use of PPE and WHS requirements, corrective action must be implemented immediately.

2.5 Record Keeping

JHR (or appropriate contractor representative) shall keep records of the inductions, inspections, corrective actions and reports prepared for the Site. These records should be evaluated and used for completing the review of this SLMP.

3. SITE LEAD MANGEMENT

Ballast within the siding, mainline and adjacent soils are contaminated with lead. The proposed construction is likely to generate lead dusts at the site.

3.1 Hazard Identification

Lead is known to cause health effects in humans, especially children and developing foetuses. SafeWork NSW recognises that females with child bearing capacity is the most sensitive receptor at work sites. Migration of lead into the environment, soils, groundwater and surface water, may cause environmental harm.

Lead dust generated during the proposed construction is a hazard, which can cause a risk if exposures occur. The main route of human exposure is via inhalation and ingestion of lead dust. Therefore, measures should be aimed at minimising dust generation and exposure at the worksite. As children and pregnant women are particularly prone to lead related health effects, care should be taken to avoid the spread of lead dust and stop its spread to workers homes and premises. SafeWork NSW definitions of lead risk work is provided in **Appendix 1** of this SLMP.

The main routes of ecological exposure are via dust generation and overland flow.

3.2 Lead Management Strategy

Section 17 of the WHS Act requires risks to health and safety be eliminated so far as is reasonably practicable. The SafeWork Australia code of practice for managing risks of hazardous chemicals in workplace provides a hierarchy of control measures. This includes (most preferred to least) eliminate hazard, substitution, isolation and implementing engineering controls. SafeWork NSW also advocates elimination of the hazard as the most preferred method of control.

The site lead management strategy is therefore to temporarily eliminate the hazard from the immediate work area and isolate the contaminated material from the workers. This is to be done by excavation of lead impacted soils to temporary stockpiles outside the main works area though still within the rail corridor and within close proximity to current locations of impact. Given that contamination is mainly confined to siding and mainline ballast material (and associated fines) and surface soils immediately adjacent to the siding, it is considered feasible to remove this material, whilst controlling any exposure risks during its removal and stockpiling.

Medium impact materials should be excavated and stockpiled separately to high impact materials to afford flexibility to long term management.

3.3 Hazard Elimination

The hazard elimination activity will involve minimum required number of workers to excavate the ballast and associated fines from the length of siding and / or mainline identified as being contaminated with lead. Surface soil adjacent to this length of siding is also to be excavated from east and west of the siding. The excavated material is to be stockpiled onsite, ensuring it is located away from human and environmental exposure and adhering to stockpiling requirements provided under **Section 3.5**. General and specific requirements and controls are identified in **Tables 3.1** and **3.2** to ensure human and environmental safety during hazard elimination activity.

Table 3-1: General Hazard Mitigation Measures

Category	General Requirements	
Hazard elimination activity	Excavation	Excavation should be completed so that visible airborne dust is not generated. Excavation should not occur on windy days, dust should be suppressed to the extent practical and as required during excavation e.g. through use of a water cart*. The details of this SLMP should be communicated to all onsite workers including external contractors, any workers involved should adhere to requirements set out below and in Table 3.2
	Stockpiling	Refer to stockpiling requirements set out in section 3.4
	Facilities	The following facilities are to be provided: <ul style="list-style-type: none"> • Clean and dust free workers area for eating and drinking • Toilet facilities and wash up areas for decontamination • Disposal of any work-related contaminated material such as dust masks, disposable gloves and overalls, etc.
Exposure abatement	Personal protective equipment (PPE)	Standard rail corridor PPE – full length clothing (sleeves and trousers / overalls), orange high visibility upper clothing or vest, safety (steel capped) boots, protective eyewear, hard hat or hat and gloves at all times. A P2 dust mask must be worn whenever exposure to lead dusts are likely (see specific requirements Table 3.2
	Onsite practices	Use the required PPE whenever onsite, decontaminate at the end of the work shift by removing/washing/cleaning dusty work clothes, boots, shoes, tools, phones, hands/face/any other exposed body area, always wash hands before eating or drinking, eating or drinking to be conducted in a clean dust free location, any dust cleaning to be performed with damp cloth/mop, refrain from smoking or chewing gum when exposure to lead dust is likely, keep nails short.
	Offsite practices	Leave shoes, work clothes, work boots outside unless free of site-related dust, if possible shower prior to coming home, keep your work gear separate from other clothing and wash separately. Keep baby equipment like child car seats etc. out of work vehicle. Discourage family visits to the work place during hazard elimination.

*Note that lead is likely to be associated with fines present within the ballast and watering for dust suppression may wash these down. Watering should not exceed the liquid limit of contaminated materials and evidence of run-off during watering should be adopted as a key indicator of over watering. As a precaution a thin layer of capping (located immediately beneath the ballast) may also be removed to ensure residual lead does not remain. The workplace exposure standard for lead in dust is 0.05 mg/m³ as time weighted average (SafeWork Australia 2018).

Table 3-2: Summary of Risk Mitigation Measures for Specific Human Receivers

Category	Specific Requirements
Workers undertaking excavation	<p>Adhere to all general requirements set out in Table 3.1. Whilst inside the cabin of the excavator, wearing of a dust mask is optional if:</p> <ul style="list-style-type: none"> • Cabin is air conditioned and all windows are up and • Cabin air circulation system (air conditioning) is equipped with high efficiency filter and • Has good seals to eliminate cabin dust intrusion
	<p>Workers outside the excavator should be used minimally and on as need basis. These workers should remain outside a 20m exclusion zone from the excavator, ideally upwind and adhere to all general requirements set out in Table 3.1. In addition to a P2 mask, if there is a need to be closer to the excavator (i.e. within 20m exclusion zone), workers should also wear a Type 5 single use disposable Tyvek suit.</p>
Workers in direct contact	<p>Workers undertaking stockpiling</p> <p>Any workers in direct contact with lead contaminated material, such as during stockpiling, should strictly adhere to general requirements set out in Table 3.1 ensuring all PPE's are used and onsite/offsite practices strictly followed. These workers should also wear:</p> <ul style="list-style-type: none"> • Type 5 single use disposable Tyvek suit.
Others	<p>Onsite workers / contractors</p> <p>Any onsite workers not directly involved with the hazard elimination process should remain at a distance of approximately 50m and preferably upwind and adhere to general requirements set out in Table 3.1</p>
	<p>Public</p> <p>It is likely that public may be present at certain times at the Tarago train station during hazard elimination activities, though noting public time at the station is likely to be less than 30 minutes. JHR should assure no dust is generated within 50m of Tarago Station during excavation of contaminated materials. JHR may also wish to consider:</p> <ul style="list-style-type: none"> • Limiting access to station platform until 10 mins prior to arrival/departure of any passenger trains • Stopping excavation works 10 mins prior to arrival/departure of any passenger trains • Real time dust monitoring to confirm dust from excavation works does not reach Tarago Station (see Section 3.6.2 for further information).

3.4 Material Tracking

All materials handled during excavation of medium and high impact ballast will be tracked to verify appropriate movement and handling. The system will track materials from cradle-to-grave, and will provide detailed information on the origin, quantity and fate of all materials excavated during remediation. Records will be maintained by construction contractor site personnel defining chainage of origin, material types loaded, and material fate (temporary stockpile ID). These records should be consolidated in a tracking spreadsheet.

3.5 Stockpile Management

The excavated lead contaminated material during hazard elimination activity will be stockpiled onsite, in a manner to minimise human and environmental exposure. All workers undertaking stockpiling activities outside of the excavator should adhere to specific requirements set out in **Table 3.2**. The following stockpiling requirements should be adhered to manage any human exposure or environmental migration of lead contaminated material:

- All stockpiles of lead contaminated materials shall be placed away from drainage lines, gutters or storm water pits or inlets
- All stockpiles of lead contaminated materials shall be covered securely ensuring that surface water infiltration cannot occur and that the cover is not disturbed or blown away under windy conditions
- All stockpiles of lead contaminated materials shall be stored in secure areas and sign posted to ensure the stockpile is not inadvertently moved or uncovered, eg. 'Contaminated Stockpile – DO NOT MOVE OR UNCOVER. Contact [name and phone number of contact].'
- Stockpiles will be positioned on level surfaces to the extent practicable and construction of bunds to control ingress/egress of surface water to stockpiles shall occur
- Stockpiles will be constructed in low elongated mounds to the extent practicable; and
- During construction works, stockpile controls will be inspected on a daily basis and rectification will occur as required. Following active construction works, stockpile controls are to be inspected on a daily basis until long-term management is established.

The stockpiles of lead contaminated material are to remain onsite until a long-term management plan is put in place.

3.6 Environmental Controls

During excavation of lead impacted materials, the following environmental controls should be implemented:

- Application of water should occur to prevent generation of dust. Water application should not exceed the liquid limit of contaminated materials (i.e. no run-off)
- Sediment traps should be placed in cess drains west of the Woodlawn Siding on 100 lineal meter increments. At the completion of construction works, sediment traps should be excavated and sediment placed in the contaminated soil stockpile.

3.6.1 Surface Water Monitoring

Surface water monitoring should occur integrating as a minimum, one pre-construction monitoring event and monthly monitoring during construction. Locations to be monitored are presented on **Figure 2, Appendix 1**.

3.6.2 Air Monitoring

Air monitoring should occur integrating as a minimum:

- set-up of a high-volume air sampler on 24hr continuous sampling cycles to establish pre-construction ambient air lead concentrations with continued monitoring during construction. Results will be assessed against relevant Australian guidelines which will be adopted as trigger values for management measures. Where ambient air lead guidelines are exceeded works will stop to inform consideration of revised measures. Ramboll conservatively project a 48hr lag time on receipt of analytical results.
- real time monitoring of total dust between the lead impacted area and sensitive offsite receivers including the local school and Tarago Station on a weekly basis and during windy weather. Ramboll note it is not feasible to accurately calibrate lead in air concentrations against total dust concentrations and so each real time monitoring event will include establishment of upwind background dust levels and downwind dust levels. Where an increase

in dust above background levels is observed additional management measures will be implemented.

3.7 Post Hazard Elimination Activity

After excavation and secure stockpiling is complete, validation sampling of remnant soils will be required to assess removal of lead impacted materials. Validation sampling should occur on 50m lineal increments within medium and high impact areas from the remnant Woodlawn Siding formation, in adjacent soils and in the eastern excavation face (ballast associated with adjacent rail lines). Validation sampling will confirm the extent of remaining contamination and any additional remediation or management measures required.

3.8 SafeWork NSW Requirements

As quantitative assessment of expected change in workers blood lead has not been conducted, it would be prudent to notify SafeWork NSW of short-term lead related work involved with hazard elimination activity.

3.9 Signal Trench Construction in Area of Lead Impact

Based on review of design drawings re-presented on **Figure 2, Appendix 1** it appears likely the proposed signal trench will cross under the area of lead impact at two locations (CH: 262.380 km and CH: 262.575 km) and that advancement through the soil profile at a depth of 1.8m below rail track elevation is proposed via horizontal boring. Boring at this depth will not intercept identified lead impacts and so controls to mitigate lead exposure are not necessary. With the exception of crossings beneath the lead impacted area signal trench construction parallel to the track on the western (UP) side (CH: 262.380 km to CH: 262.575 km) and on the eastern (DOWN) side fall outside the area of lead impact. Ramboll understand trenching will occur in these areas and recommend this work can occur without management measures specific to lead.

3.10 Offsite Disposal

It is understood offsite disposal is unlikely to form part of short-term management of lead impacted soils. A waste classification is provided within the Further Intrusive Assessment Report (Ramboll 2019a) to inform consideration of long-term management strategies.

4. LIMITATIONS

This document is issued in confidence to John Holland Rail for the purposes of informing management of risks associated with lead impacted spoil to be disturbed as part of the proposed Tarago Loop Extension and associated signal trenching NSW. It should not be used for any other purpose.

The report must not be reproduced in whole or in part except with the prior consent of Ramboll Australia Pty Ltd and subject to inclusion of an acknowledgement of the source. No information as to the contents or subject matter of this document or any part thereof may be communicated in any manner to any third party without the prior consent of Ramboll Australia Pty Ltd.

Whilst reasonable attempts have been made to ensure that the contents of this report are accurate and complete at the time of writing, Ramboll Australia Pty Ltd disclaims any responsibility for loss or damage that may be occasioned directly or indirectly through the use of, or reliance on, the contents of this report.

5. REFERENCES

Department of Environment Climate Change and Water (2009) NSW Waste Classification Guidelines

Department of Infrastructure, Planning and Natural Resources (2004) Guideline for the Preparation of Environmental Management Plans

SafeWork NSW <https://www.safework.nsw.gov.au/notify-safework/lead-notifications>

SafeWork NSW (2016) NSW Code of Practice Managing Risks of Hazardous Chemicals in the Workplace

SafeWork Australia (2018) Workplace Exposure Standards for Airborne Contaminants

NHMRC Managing Individual Exposure to Lead in Australia – A Guide for Health Practitioners 2016

NSW EPA LeadSmart – Work Smart: Tradespeople and Mining Industry Workers

<http://leadsmart.nsw.gov.au/wp-content/uploads/2016/09/LeadSmart-Brochure-Working.pdf>

Ramboll 'Tarago Loop Extension, Further Intrusive Assessment and Lead Management Plan', prepared for John Holland Rail, 02 August 2019

APPENDIX 1 SAFEWORK NSW LEAD NOTIFCATION REQUIREMENTS

SafeWork NSW Lead Risk Definition

Lead risk work involves work that may cause lead levels in a worker's blood to exceed health limits.

For the period up to and including 30 June 2021 'lead risk work' means blood levels at or exceeding:

- 10 µg/dL (0.48 µmol/L) for a female of reproductive capacity
- 30 µg/dL (1.45 µmol/L) in other cases.

From 1 July 2021 'lead risk work' means:

- 5 µg/dL (0.24 µmol/L) for a female of reproductive capacity
- 20 µg/dL (0.97 µmol/L) in other cases.

SafeWork NSW Notifications

Notification must be provided if the work is likely to cause lead levels in a worker's blood to exceed healthy levels. Notification is also needed if a worker needs to be removed from working with lead.

Notification for lead risk work

SafeWork NSW states the following:

You must assess each process that involves lead to determine whether lead risk work is being carried out.

If you cannot determine whether lead risk work is being carried out, then assume it is and [notify us](#).

Submit the [Notification of lead risk work form](#) at least seven days before lead work begins. Each form is valid for the duration of the lead risk work.

You need to notify us if a worker needs to be removed from working with lead.

More information on this can be found in the [legislation](#) as well as in our [Guide on lead notifications](#). <https://www.safework.nsw.gov.au/resource-library/licence-and-registrations/guide-for-applicants-for-lead-notifications>

All lead notifications are free.

Health Monitoring

SafeWork NSW states that:

Health monitoring must be provided to workers before lead risk work starts and one month after starting.

For workers who perform ongoing lead work, biological monitoring must be arranged in accordance with the frequencies published in the WHS Regulation.

Additional guidance can be found at <https://www.safework.nsw.gov.au/notify-safework/lead-notifications>

APPENDIX 7 WASTE CLASSIFICATION

John Holland Rail
Lot 1, Lower Keppel Street
Bathurst NSW 2795
Attention: Wayne D'Souza

Date 22/08/2019

Waste Classification – Fouled Ballast from the Woodlawn Siding Tarago NSW

Ramboll Australia Pty Ltd (Ramboll) was commissioned by John Holland Rail (JHR) to support management of lead impacted spoil to be generated during proposed extension of the Tarago Loop. The proposed construction footprint is here-in referred to as "the site" (see **Appendix 1, Figure 1**).

Ramboll
Level 2, Suite 18 Eastpoint
50 Glebe Road
PO Box 435
The Junction
NSW 2291
Australia

T +61 2 4962 5444
<https://ramboll.com>

Background

Assessment of the degree and extent of lead within the proposed Tarago Loop (Ramboll 2019a) identified lead concentrations above site assessment criteria (SAC) in ballast at the top of the Woodlawn Siding formation (CH: 262.145 km to CH: 262.955 km) with a distinct area where much higher lead concentrations were observed (CH: 262.245 km and CH: 262.545 km). Lead concentrations above SAC were also observed in shallow soils adjacent (west) of the Woodlawn Siding and in 'loop tie-ins' to be redeveloped during construction.

A Short Term Lead Management Plan (Ramboll 2019b) was prepared to mitigate risks of worker exposure to lead during the proposed loop extension which included segregation of lead impacted materials.

The purpose of this report is to define a waste classification that will inform consideration of offsite disposal as a long term management option for lead impacted spoil. A surplus of spoil does not exist and so this waste classification is limited to materials which may not be suitable to remain onsite based on lead impacts.

Fieldwork

The following scope of work was undertaken to complete the site intrusive assessment and reporting:

- Mobilisation to the site on 26 July 2019
- Site walk-over and allocation of test pit sites
- Collection of soil samples from site test pits and surface soils
- Remobilisation 12 August 2019
- Collection of shallow soil samples targeting 'tie-ins' to the loop and main rail line and targeting refined delineation of impacts at the northern end of site
- Submission of samples to the laboratory to inform consideration of risks associated with lead and to inform management options (including waste classification for offsite disposal).
Specifically this included:
 - analyses of six primary ballast samples from the Woodlawn Siding for TRH, BTEXN, PAH, 8 metals (As, Cd, Cr, Cu, Pb, Ni, Zn), asbestos (presence / absence)
 - analyses of three samples for TCLP lead
 - analyses of 30 primary samples of ballast from the Woodlawn Siding, 'tie-ins' to active rail lines and shallow soils adjacent the Woodlawn Siding for lead

Observations

Conditions generally found at the site during the subsurface investigations are outline in **Table 1**.

Table 1: Summary of Observed Geology

Location	Approximate depth	Lithology
Siding (test pits)	Ballast layer: 0-0.3 m	Fill: silty gravel, coarse – cobbles, grey/brown (higher silt content and orange / yellow staining localised within area of lead impact), dry, loose, angular
	Capping layer: 0.3-0.5 m	Fill: clayey gravelly sand, grey/black, moist, coarse, fine sub-angular gravel
	Structural base/subgrade: 0.5-0.7 m	Fill: gravelly clay, grey with brown mottling, moist, stiff, low plasticity
Surface soils	0-0.1 m	Variable between sites but generally: Fill: silty sand, gravel, grey, dry, fine to medium, sub-angular

Photographs in **Appendix 2** provide a general depiction of the site and the fill material encountered during the investigation.

Results

Tabulated assessment of analytical results against Waste Classification Guidelines is presented in **Tables 1 – 2, Appendix 3**.

Assessment of TRH, BTEXN, PAH, 8 metals and asbestos results against waste classification criteria infers absence of impacts other than lead above General Solid Waste (CT1 criteria).

Lead concentrations that exceed site assessment criteria (1500 mg/kg) also exceed Contaminant Thresholds (CT1 and CT2) Specific Contaminant Concentration 1 (SCC1) defined within the Waste

Classification Guidelines. Remaining waste criteria inform classification as Restricted Solid Waste and for lead comprise of SCC2 (6000 mg/kg) and TCLP2 (20 mg/L).

Summary assessment of lead results against Restricted Solid Waste criteria is presented as **Table 2**. Exceedances are presented in bold.

Table 2: Summary assessment of lead concentrations above Site Assessment Criteria against Restricted Solid Waste criteria

Location	Sampling site (depth m)	Chainage (km)	Lead Conc (mg/kg)	TCLP (mg/L)
Siding (test pits) ballast layer	TP1 0.1-0.5	262.145	4400	--
	TP2 0.1-0.4	262.245	3500	--
	TP3 0.1-0.5	262.345	29000	--
	TP4 0.1-0.3	262.430	8800	4.3
	TP5 0.1-0.45	262.545	3100	32
	TP6 0.1-0.4	262.645	6000	8.2
	TP7 0.1-0.4	262.745	3300	--
	TP8 0.1-0.3	262.845	2800	--
Surface soils	SS7 0.0-0.1	262.805	4100	--
	SS11 0.0-0.1	262.650	2200	--
	SS12 0.0-0.1	262.585	32000	--
	SS13 0.0-0.1	262.585	2600	--
	SS16 0.0-0.1	262.490	15000	--
	SS24	262.040	3000	--
	SS25	262.050	11000	--
	SS27	262.400	6700	--
	SS28	262.460	12000	--
	SS29	262.700	3700	--

BOLD – Concentration exceeds Restricted Solid Waste Criteria

Key findings are:

- The total lead concentration in TP5 0.1-0.45 (3100 mg/kg) falls below SCC2 (6000 mg/kg) however the leachate (32 mg/L) exceeds SCC2 (20 mg/L). Within this context where lead impacts are observed at concentrations above site assessment criteria the appropriate waste classification is Hazardous Waste
- The total concentrations at eight locations (TP3 0.1-0.5, TP4 0.1-0.3, TP6 0.1-0.4, SS12 0.0-0.1, SS16 0.0-0.1, SS25, SS27 and SS28) exceed SSC2, classifying them as Hazardous Waste.

The medium and high impact areas presented on **Figure 2, Appendix 1** define areas where ballast / shallow soil based spoil to be generated during loop extension would be considered Hazardous Waste (if disposed of offsite).

Laboratory reports are presented as **Appendix 4**.

Conclusion

To inform consideration of offsite disposal as a long term management option, spoil to be generated during loop expansion that has lead concentrations above site assessment criteria is classified as Hazardous Waste.

All waste should be transported and disposed of according in general accordance with the procedures detailed in the *Waste Classification Guidelines – Part 1: Classifying Waste* (NSW EPA, 2014).

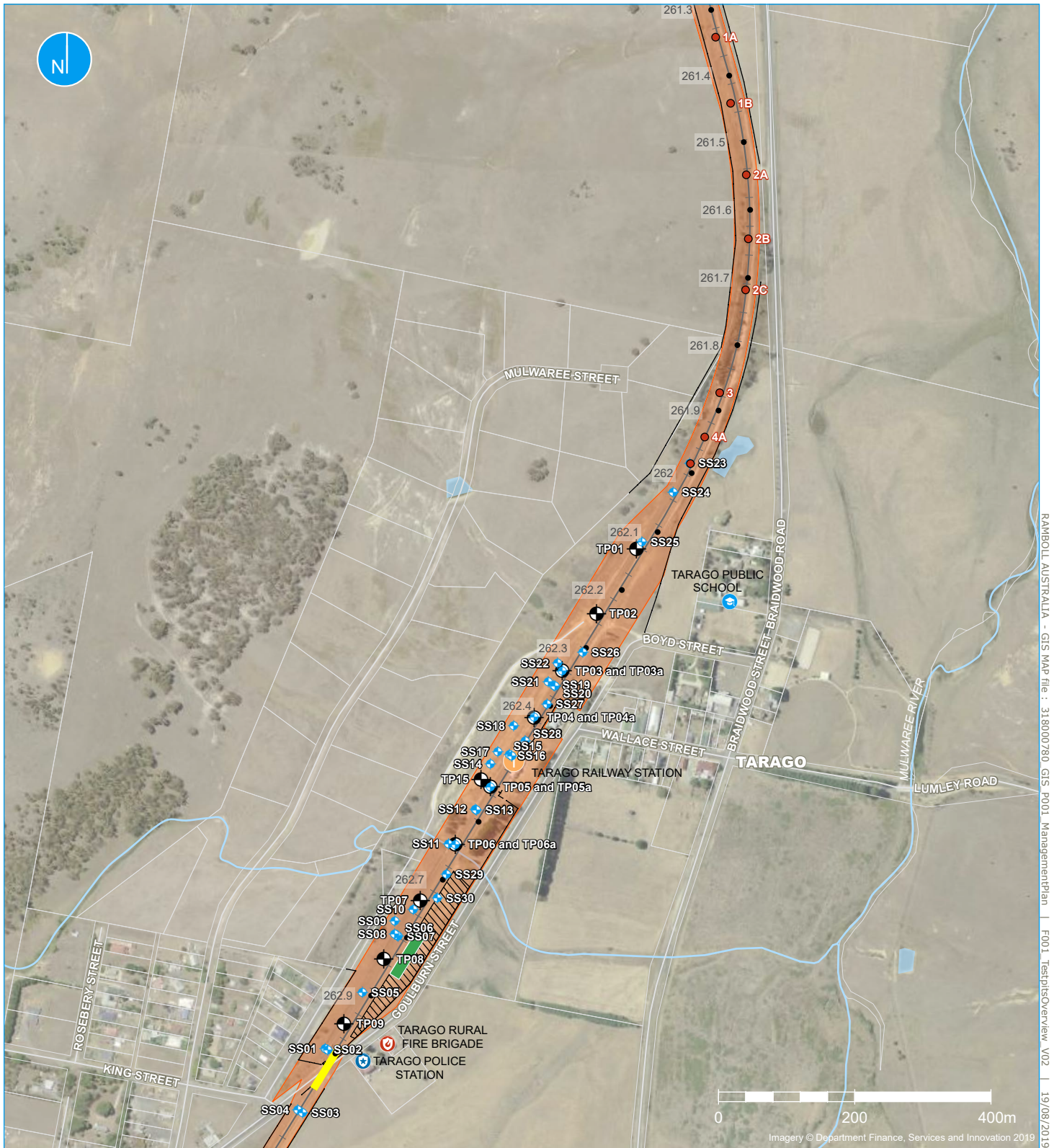
Yours sincerely

Stephen Maxwell

Lead Consultant
3182675 - Hunter

D +61 478658194
M +61 478658194
smaxwell@ramboll.com

**APPENDIX 1
FIGURES**

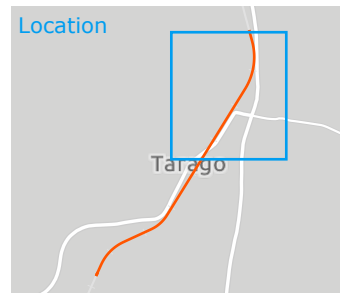


Legend

- Rail corridor
- Rail corridor fence
- 0.1km chainage point
- Goulburn Street level crossing
- Construction compound
- Goods shed exclusion zone

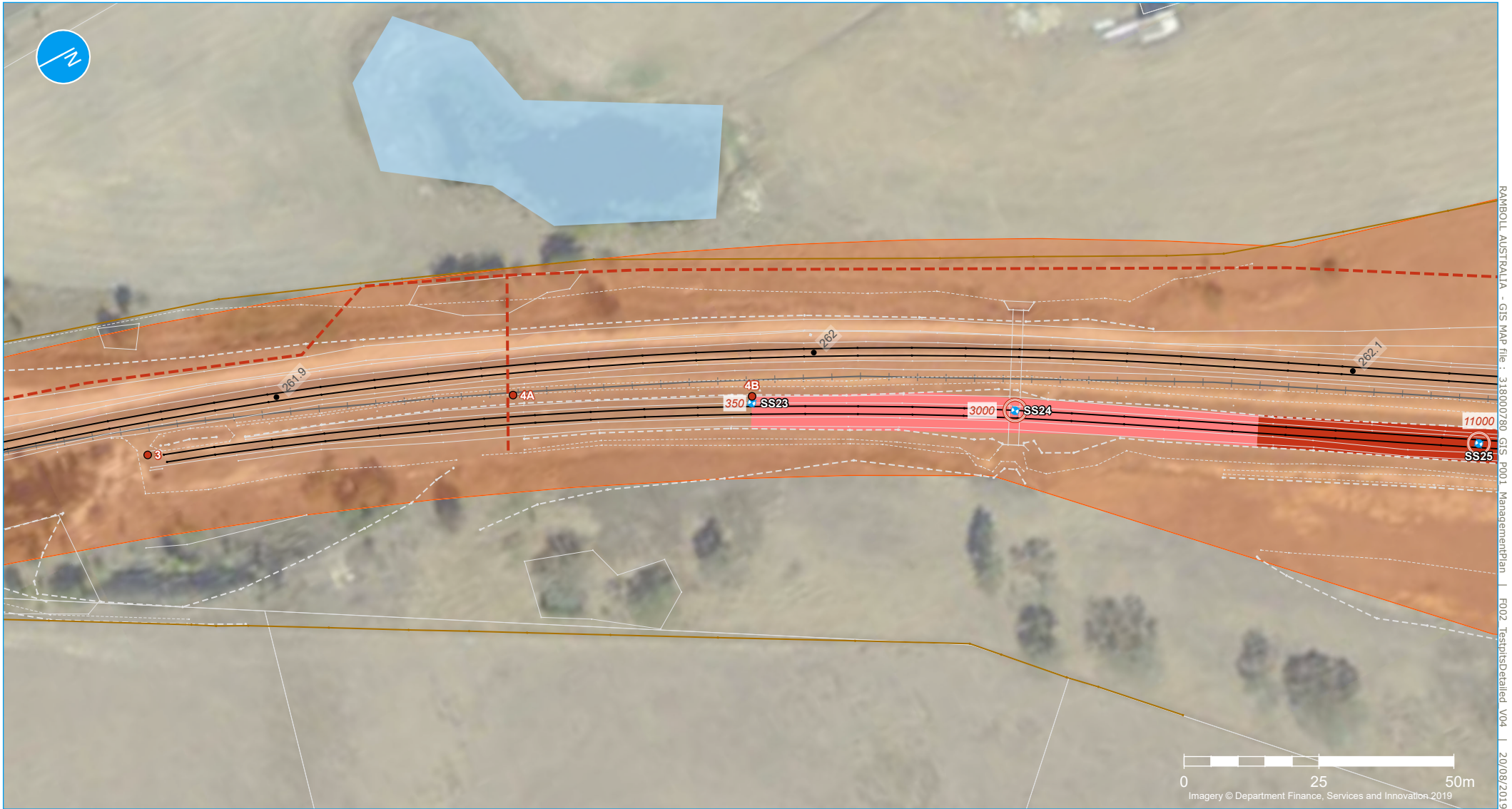
Sampling locations (siding works)

- Shallow soil (Ramboll 2019)
- Test pit (Ramboll 2019)
- Previous sample location (McMahon)



A4
1:8,000

Figure 1 | Overview of siding works sampling locations



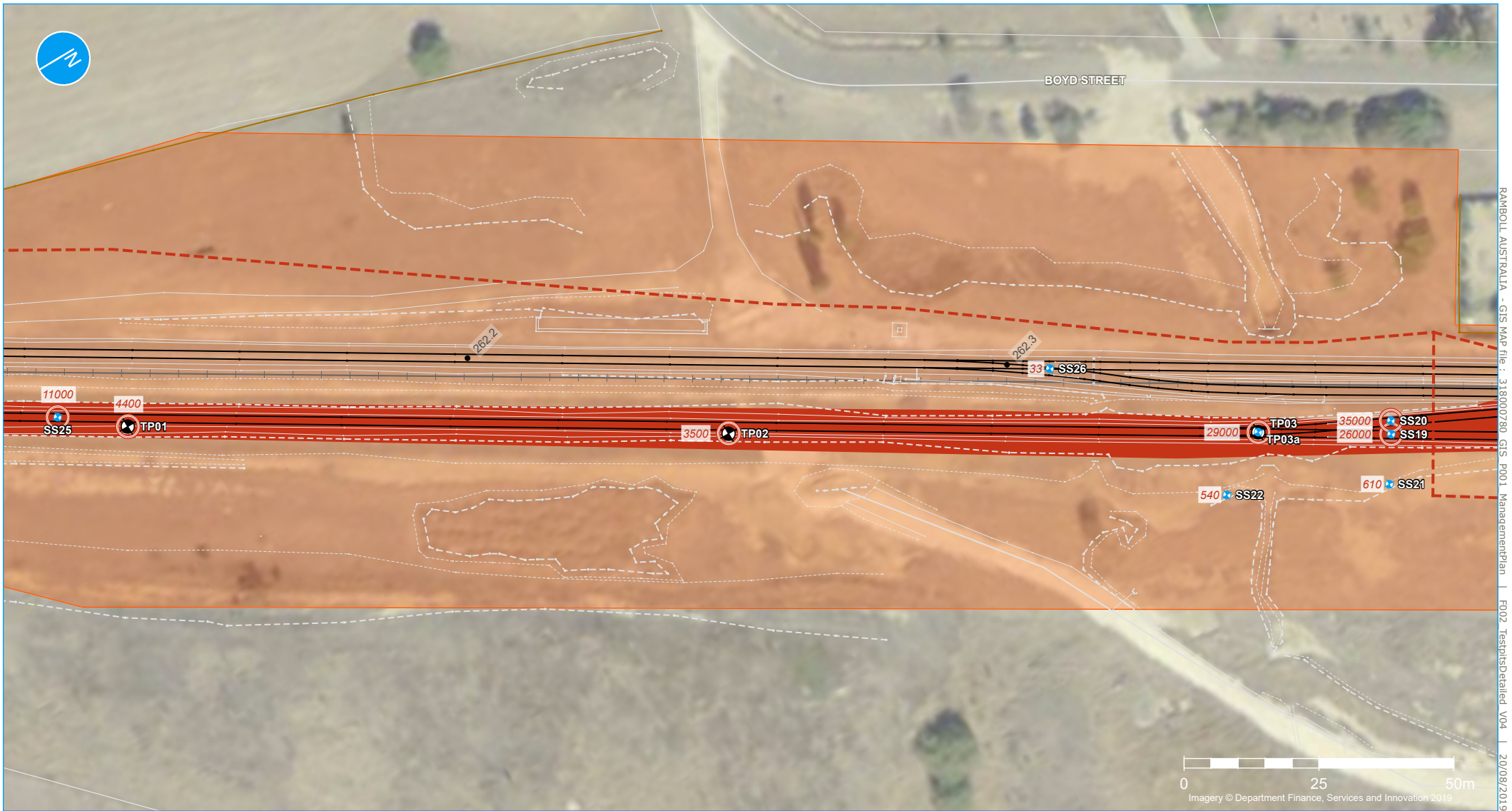
Legend

- | | | | |
|---|---|--|---|
| <ul style="list-style-type: none"> Rail corridor Rail corridor fence 0.1km chainage point Signal trench (approximate) | <p>Survey lines</p> <ul style="list-style-type: none"> Rail track Top of bank Bottom of bank Other elements | <p>Sampling locations</p> <ul style="list-style-type: none"> 1200 Lead concentration (mg/kg) Shallow soil (Ramboll 2019) Previous sampling location (McMahon) Exceedance location | <p>Exceedance area</p> <ul style="list-style-type: none"> High Medium |
|---|---|--|---|

A4
1:1,000



Figure 2 | Siding works exceedances



RAMBOLL AUSTRALIA - GIS MAP file - 318000780 GIS_P001_ManagementPlan | P002_TestpitsDetailed_V04 | 20/08/2019

Legend

- | | | | |
|---|---|---|--|
| <ul style="list-style-type: none"> Rail corridor Rail corridor fence 0.1km chainage point Signal trench (approximate) | <p>Survey lines</p> <ul style="list-style-type: none"> Rail track Top of bank Bottom of bank Other elements | <p>Sampling locations</p> <ul style="list-style-type: none"> Lead concentration (mg/kg) Shallow soil (Ramboll 2019) Test pit (Ramboll 2019) Exceedance location | <p>Exceedance area</p> <ul style="list-style-type: none"> High |
|---|---|---|--|

A4
1:1,000

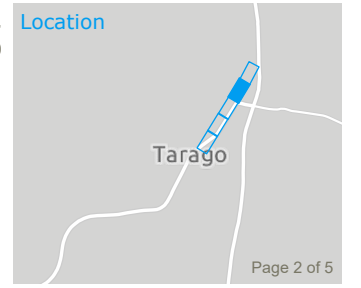
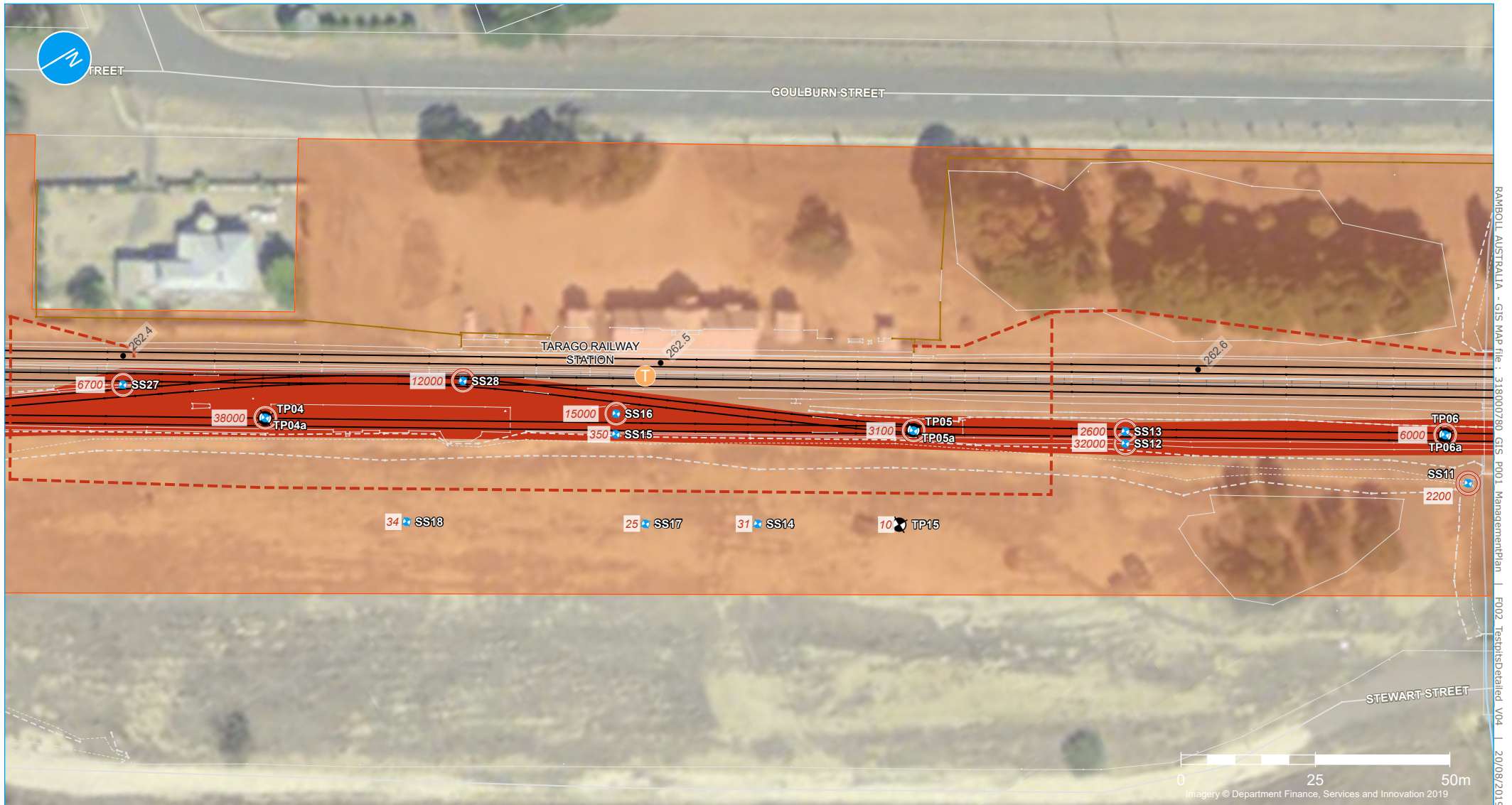


Figure 2 | Siding works exceedances



RAMBOLL AUSTRALIA - GIS MAP file - 318000780 GIS_P001_ManagementPlan | F002_TestpitsDetailed_V04 | 20/08/2019

Legend

- Rail corridor
- Rail corridor fence
- 0.1km chainage point
- Signal trench (approximate)
- Rail track
- Top of bank
- Bottom of bank
- Other elements
- Exceedance area
- High

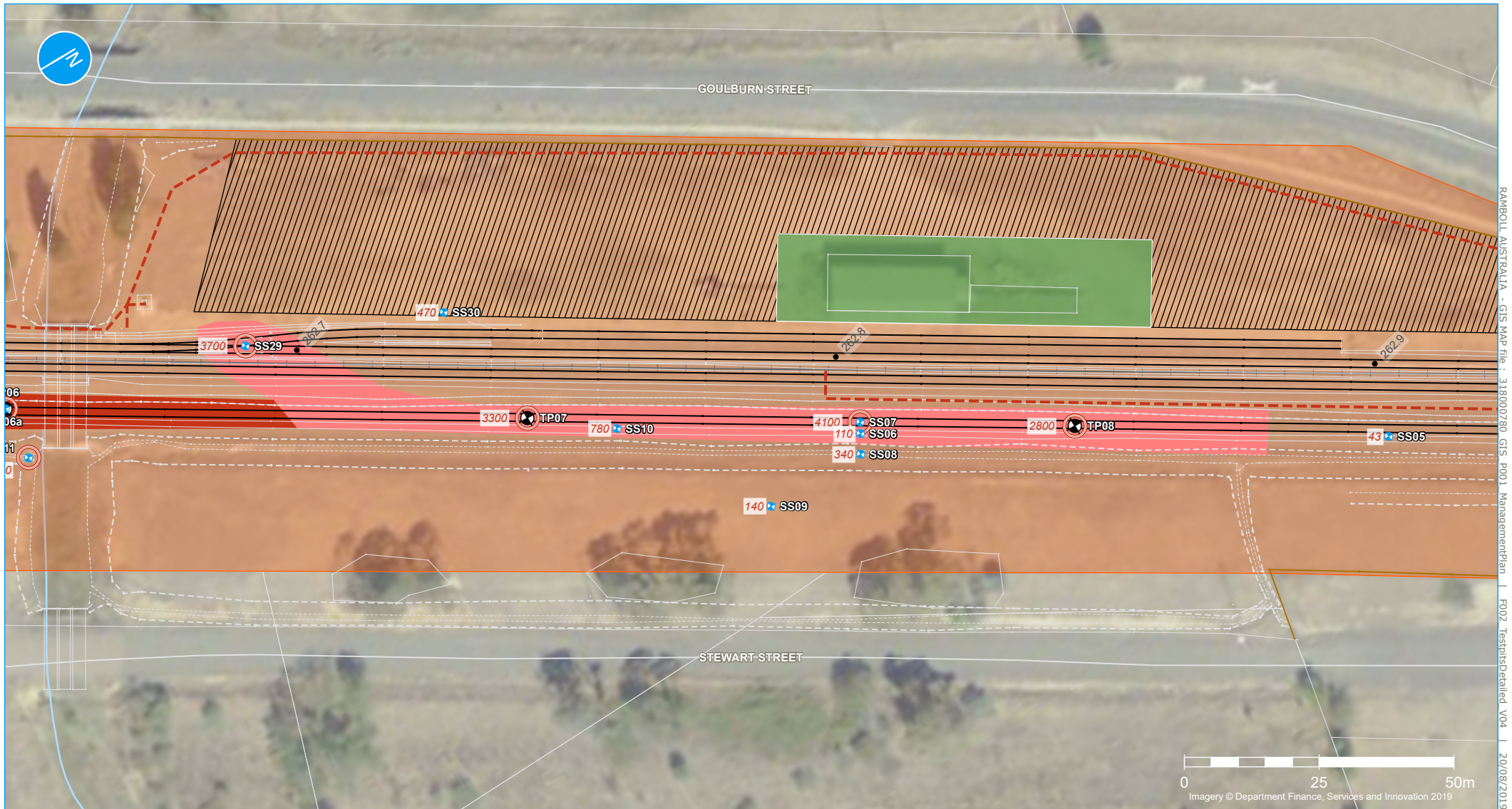
Figure 2 | Siding works exceedances

A4
1:1,000

Location

Tarago

Page 3 of 5



RAMBOLL AUSTRALIA - GIS MAP file - 318000780 GIS_P001_ManagementPlan | P002_TestpitsDetailed_V04 | 20/08/2019

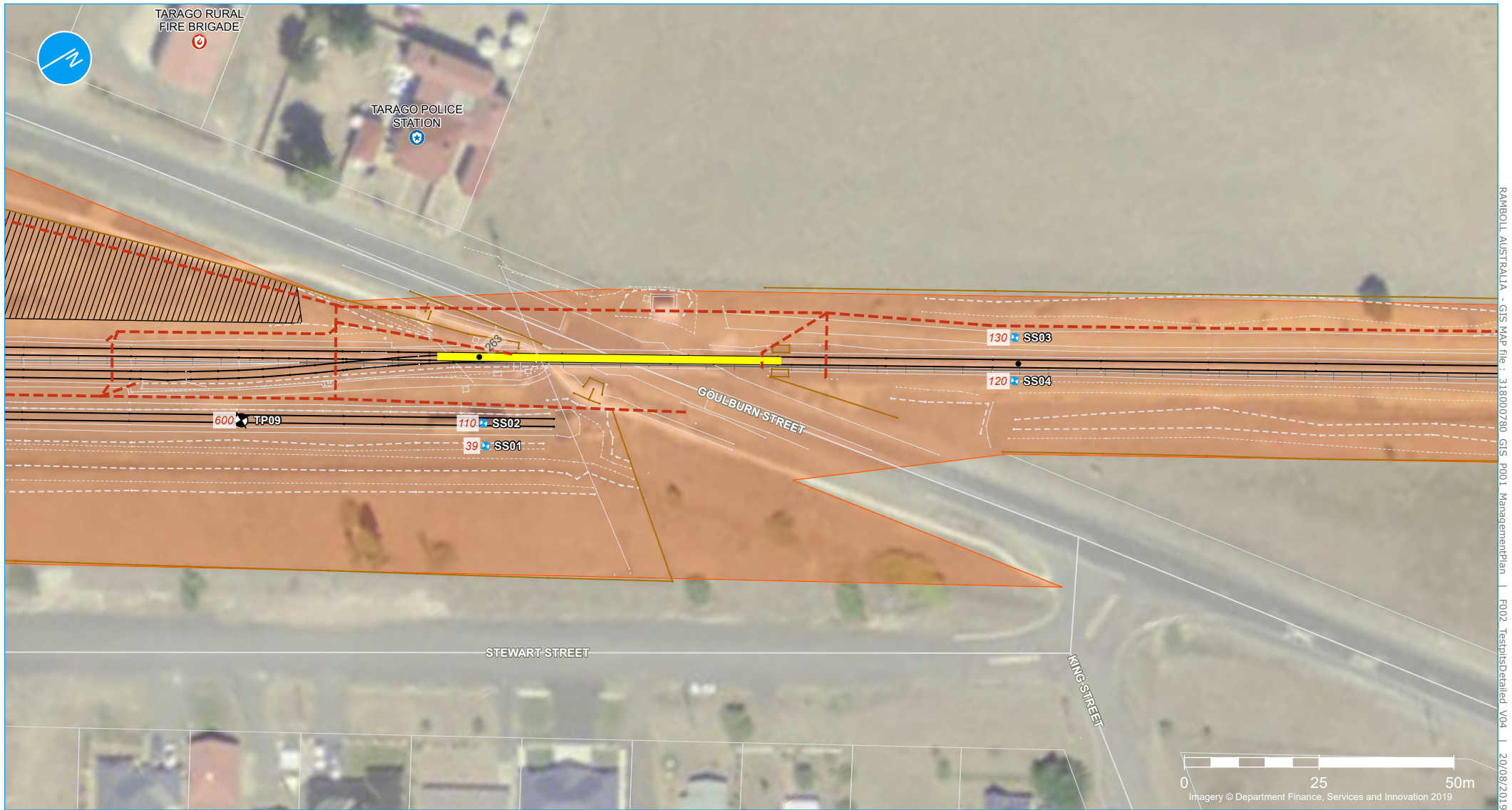
Legend

- | | | | |
|--|---|--|---|
| <ul style="list-style-type: none"> Rail corridor Rail corridor fence 0.1km chainage point Signal trench (approximate) Construction compound Goods shed exclusion zone | <p>Survey lines</p> <ul style="list-style-type: none"> Rail track Top of bank Bottom of bank Other elements | <p>Sampling locations</p> <ul style="list-style-type: none"> 1200 Lead concentration (mg/kg) + Shallow soil (Ramboll 2019) ⊕ Test pit (Ramboll 2019) ○ Exceedance location | <p>Exceedance area</p> <ul style="list-style-type: none"> High Medium |
|--|---|--|---|

A4
1:1,000



Figure 2 | Siding works exceedances



RAMBOLL AUSTRALIA - GIS MAP file - 318000780 GIS_P001_ManagementPlan | F002_TestpitsDetailed_V04 | 20/08/2019

Legend

- | | |
|--|---|
| Rail corridor | Survey lines |
| Rail corridor fence | Rail track |
| 0.1km chainage point | Top of bank |
| Goulburn Street level crossing | Bottom of bank |
| Signal trench (approximate) | Other elements |
| Construction compound | |

- Sampling locations**
- 1200 Lead concentration (mg/kg)
 - + Shallow soil (Ramboll 2019)
 - ⊕ Test pit (Ramboll 2019)

A4
1:1,000



Figure 2 | Siding works exceedances

**APPENDIX 2
PHOTOGRAPHIC LOG**

1. Soil Sample Photos – North of Goulburn St Level Crossing

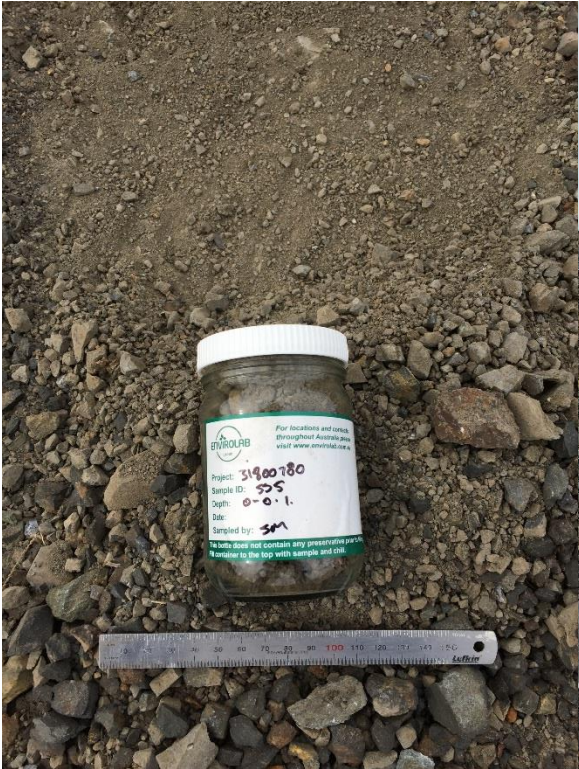




Figures 1.1 to 1.7: Test Pit TP9 samples and relative location looking south to level crossing.

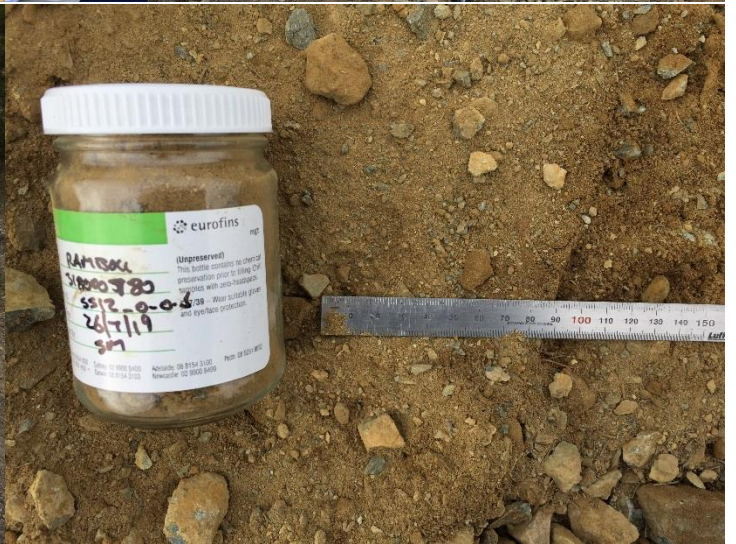
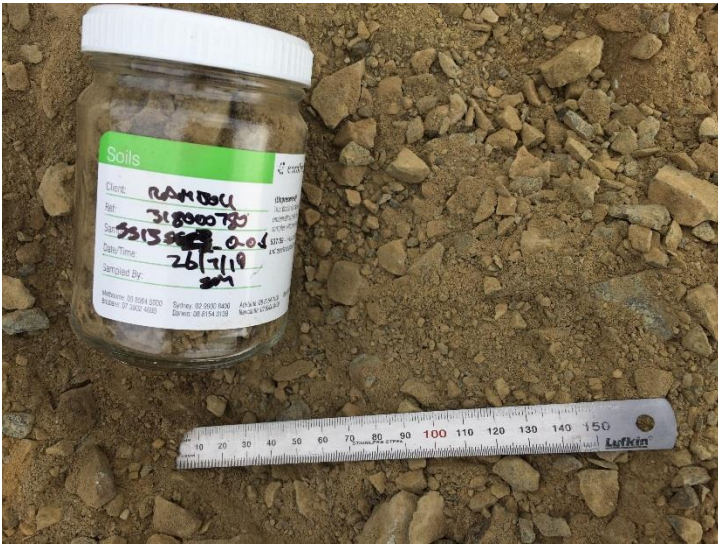


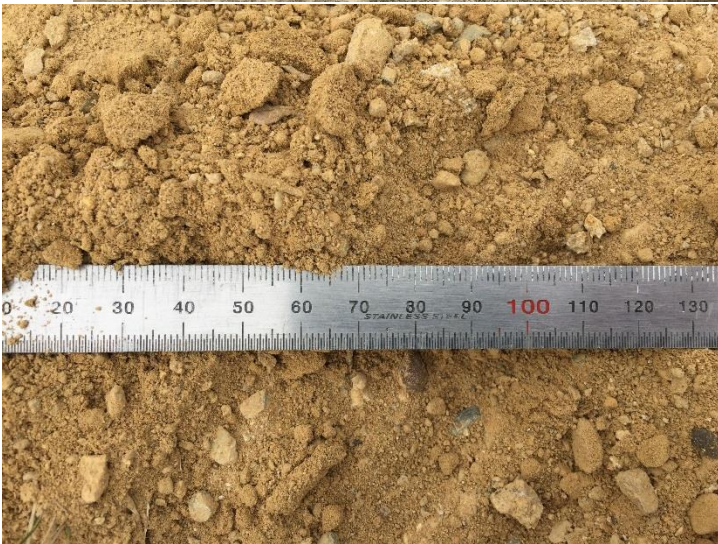




























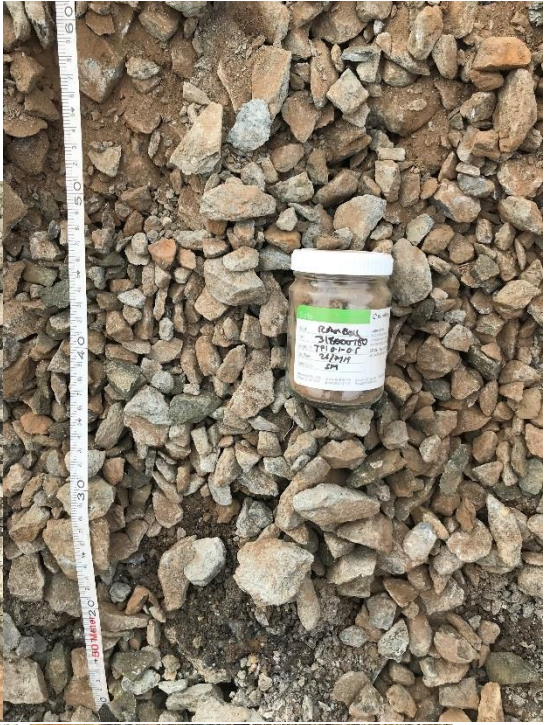
















**APPENDIX 3
RESULTS**

**APPENDIX 4
LABORATORY REPORTS**

	CT1 - General Solid Waste ¹	CT2 - Restricted Solid Waste ¹	SCC1 - General Solid Waste ²	SCC2 - Restricted Solid Waste ²	TCLP1 - General Solid Waste ³	TCLP2 - Restricted Solid Waste ³	Sample Type:	Soil	Soil	Soil	Soil	Soil	Soil
							Sample number:	S19-JI39840	S19-JI39841	S19-JI39842	S19-JI39843	S19-JI39844	S19-JI39845
							Sample date:	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19
							Sample ID:	TP4 0.1-0.3	TP5 0.1-0.45	TP6 0.1-0.4	TP7 0.1-0.4	TP8 0.1-0.3	TP9 0.1-0.3
							Project Name:	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop
							Sampling Method:	Test Pit	Test Pit	Test Pit	Test Pit	Test Pit	Test Pit

Analyte grouping / Analyte	Units	LOR
----------------------------	-------	-----

EA055: Moisture Content	Units	LOR
Moisture Content (dried @ 103°C)	%	1
		3
		3.7
		2.4
		< 1
		1.1
		21

EG005T: Total Metals by ICP-AES	Units	LOR
Arsenic	mg/kg	5
Cadmium	mg/kg	1
Chromium (VI)	mg/kg	2
Copper	mg/kg	5
Lead	mg/kg	5
Nickel	mg/kg	2
Zinc	mg/kg	5

EG035T: Total Recoverable Mercury by FIMS	Units	LOR
Mercury	mg/kg	0.1

EP075(SIM): Polynuclear Aromatic Hydrocarbons	Units	LOR
Naphthalene	mg/kg	0.5
Acenaphthylene	mg/kg	0.5
Acenaphthene	mg/kg	0.5
Fluorene	mg/kg	0.5
Phenanthrene	mg/kg	0.5
Anthracene	mg/kg	0.5
Fluoranthene	mg/kg	0.5
Pyrene	mg/kg	0.5
Benz(a)anthracene	mg/kg	0.5
Chrysene	mg/kg	0.5
Benzo(b+j)fluoranthene	mg/kg	0.5
Benzo(k)fluoranthene	mg/kg	0.5
Benzo(a)pyrene	mg/kg	0.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.5
Dibenz(a,h)anthracene	mg/kg	0.5
Benzo(a,h,i)perylene	mg/kg	0.5
Sum of polycyclic aromatic hydrocarbons	mg/kg	0.5
Benzo(a)pyrene TEQ (zero)	mg/kg	0.5
Benzo(a)pyrene TEQ (half LOR)	mg/kg	0.5
Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5

EP080/071: Total Petroleum Hydrocarbons	Units	LOR
C6 - C9 Fraction	mg/kg	10
C10 - C14 Fraction	mg/kg	50
C15 - C28 Fraction	mg/kg	100
C29 - C36 Fraction	mg/kg	100
C10 - C36 Fraction (sum)	mg/kg	50

EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions	Units	LOR
C6 - C10 Fraction	mg/kg	10
C6 - C10 Fraction minus BTEX (F1)	mg/kg	10
>C10 - C16 Fraction	mg/kg	50
>C16 - C34 Fraction	mg/kg	100
>C34 - C40 Fraction	mg/kg	100
>C10 - C40 Fraction (sum)	mg/kg	50
>C10 - C16 Fraction minus Naphthalene (F2)	mg/kg	50

EP080: BTEXN	Units	LOR
Benzene	mg/kg	0.2
Toluene	mg/kg	0.5
Ethylbenzene	mg/kg	0.5
meta- & para-Xylene	mg/kg	0.5
ortho-Xylene	mg/kg	0.5
Total Xylenes	mg/kg	0.5
Sum of BTEX	mg/kg	0.2
Naphthalene	mg/kg	1

Metals TCLP	Units	LOR
Lead	mg/L	0.1

EA200: AS 4964 - 2004 Identification of Asbestos in Soils	Units	LOR
Asbestos Detected	Presence	Presence
Asbestos Type	Yes / No	Yes / No

Blank Cell indicates no criterion available
 LOR = Limit of Reporting
 NSW EPA Waste Classification Guidelines - Part 1: Classification of Waste
¹ Maximum values of specific contaminant concentration (SCC) for classification without TCLP
² Maximum values for leachable concentration and specific contaminant concentration when used together
³ Values are the same for general solid waste (putrescible) and general solid waste (non-putrescible).
 Blank cell indicates no screening criterion available
 For Limit of Reporting (LOR) refer to laboratory certificates of analysis
 --- Indicates sample not analysed
 Concentration in red font and grey box exceed CT1 screening value
 Concentration in blue font and grey box exceed CT2 screening value
 Concentration in orange font and grey box exceed SCC1 or TCLP1 screening value
 Concentration in green font and grey box exceed SCC2 or TCLP 2 screening value
 Concentrations below the LOR noted as <value

	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample Type:	SS24	SS25	SS28	SS29	S19-JI39891	S19-JI39893	S19-JI39896	S19-JI39899	S19-JI39901	S19-JI39904	S19-JI39907	S19-JI39926	S19-JI39930	S19-JI39931				
Sample number:																		
Sample date:	12-08-19	12-08-19	12-08-19	12-08-19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19	26/07/19
Sample ID:	S19-Au17275	S19-Au17276	S19-Au17279	S19-Au17280	TP1 0.1-0.5	TP2 0.1-0.4	TP3 0.1-0.5	TP4 0.1-0.3	TP5 0.1-0.45	TP6 0.1-0.4	TP7 0.1-0.4	SS7 0.0-0.1	SS11 0.0-0.1	SS12 0.0-0.1				
Project Name:	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop
Sampling Method:					Test pit	Test pit	Test pit	Test pit	Test pit	Test pit	Test pit	Test pit	Test pit	Test pit	Test pit	Test pit	Test pit	Test pit

Analyte grouping/Analyte	Units	LOR																		
EG005T: Total Metals by ICP-AES																				
Lead	1500	6000			mg/kg	5	3000	11000	12000	3700	4400	3500	29000	38000	3100	6000	3300	4100	2200	32000

Blank Cell indicates no criterion available
 LOR = Limit of Reporting
 NSW EPA Waste Classification Guidelines - Part 1: Classification of Waste
¹ Maximum values of specific contaminant concentration (SCC) for classification without TCLP
² Maximum values for leachable concentration and specific contaminant concentration when used together
⁴ Values are the same for general solid waste (putrescible) and general solid waste (non-putrescible).
 Blank cell indicates no screening criterion available
 For Limit of Reporting (LOR) refer to laboratory certificates of analysis
 --- Indicates sample not analysed
 Concentration in orange font and grey box exceed SCC1 or TCLP1 screening value
 Concentration in green font and grey box exceed SCC2 or TCLP 2 screening value
 Concentrations below the LOR noted as <value

	SCC1 - General Solid Waste ²	SCC2 - Restricted Solid Waste ²	TCLP1 - General Solid Waste ²	TCLP2 - Restricted Solid Waste ²	Sample Type:	Soil	Soil	Soil	Soil
					Sample number:	S19-JI39932	S19-JI39935	S19-JI39999	S19-JI40000
					Sample date:	26/07/19	26/07/19	26/07/19	26/07/19
					Sample ID:	SS13 0.0-0.1	SS16 0.0-0.1	SS19 0.0-0.1	SS20 0.0-0.1
					Project Name:	Tarago Loop	Tarago Loop	Tarago Loop	Tarago Loop
					Sampling Method:	Test pit	Test pit	Shallow Soil	Shallow Soil

Analyte grouping/Analyte	Units		LOR							
EG005T: Total Metals by ICP-AES										
Lead	1500	6000			mg/kg	5	2600	15000	26000	35000

Blank Cell indicates no criterion available
 LOR = Limit of Reporting
 NSW EPA Waste Classification Guidelines - Part 1: Classification of Waste
¹ Maximum values of specific contaminant concentration (SCC) for classification without TCLP
² Maximum values for leachable concentration and specific contaminant concentration when used together
⁴ Values are the same for general solid waste (putrescible) and general solid waste (non-putrescible).
 Blank cell indicates no screening criterion available
 For Limit of Reporting (LOR) refer to laboratory certificates of analysis
 --- Indicates sample not analysed
 Concentration in orange font and grey box exceed SCC1 or TCLP1 screening value
 Concentration in green font and grey box exceed SCC2 or TCLP 2 screening value
 Concentrations below the LOR noted as <value



CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

Sydney Laboratory
Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1, 21 Smallwood Pl, Murarie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company		Ramboll		Project No		318000780		Project Manager		Stephen Maxwell		Sampler(s)		SM and SC			
Address		50 Glebe Road the Junction		Project Name				EDD Format (ESdat, EQUIS, Custom)		Excel and PDF		Handed over by		Stephen Maxwell			
Contact Name		Stephen Maxwell		<small>Analyses</small> <small>(Note: Where multiple analyses are requested, please specify "Total" or "Filtered" SUITE code numbers used for analysis SUITE pre-req)</small> TRH, BTEX, PAH 8 Mettias Asbestos (Presence/Absence)								Email for Invoice		smaxwell@ramboll.com asiapac-accounts@ramboll.com			
Phone No		0478 658 194												Email for Results		smaxwell@ramboll.com jblackwell@ramboll.com	
Special Directions														Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)		<input type="checkbox"/> Overnight (9am)* <input type="checkbox"/> 1 Day* <input type="checkbox"/> 2 Day* <input checked="" type="checkbox"/> 3 Day* <input type="checkbox"/> 5 Day* <input type="checkbox"/> Other () * Surcharges apply	
Purchase Order														Containers			
Quote ID No		180813RAMN_1										1L Plastic					
												250mL Plastic					
												125mL Plastic					
												200mL Amber Glass					
												40mL VOA Vial					
												500mL PFAS Bottle					
												Jar (Glass or HDPE)					
												Other (Asbestos AS4999, WA Guidelines)					
No		Client Sample ID		Sampled Date/Time (dd/mm/yy hh:mm)		Matrix (Solid (S) Water (W))								Sample Comments / Dangerous Goods Hazard Warning			
1		TP4_0.1-0.3		26/07/19		S		X		X		X					
2		TP5_0.1-0.45		26/07/19		S		X		X		X					
3		TP6_0.1-0.4		26/07/19		S		X		X		X					
4		TP7_0.1-0.4		26/07/19		S		X		X		X					
5		TP8_0.1-0.3		26/07/19		S		X		X		X					
6		TP9_0.1-0.3		26/07/19		S		X		X		X					
7		TP10_0.2		26/07/19		S		X		X		X					
8		TP11_0.1		26/07/19		S		X		X		X					
9		TP12_0.1		26/07/19		S		X		X		X		1 1 Asbestos bag for analysis			
10		TP13_0.1		26/07/19		S		X		X		X					
		Total Counts						10		10		10					
Method of Shipment		<input type="checkbox"/> Courier (#)		<input checked="" type="checkbox"/> Hand Delivered		<input type="checkbox"/> Postal		Name		Signature		Date		Time			
Eurofins mgt Laboratory Use Only		Received By		ELVIS D		SYD BNE MEL PER ADL NTL DRW		Signature		Date		26/7/19		Time 5:54pm			
		Received By				SYD BNE MEL PER ADL NTL DRW		Signature		Date		_/_/		Time			
														Temperature 16.7°C			
														Report No 608044			

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

Company	Ramboll	Project №	318000780	Project Manager	Stephen Maxwell	Sampler(s)	SM and SC	
Address	50 Glebe Road the Junction	Project Name		EDD Format (ESdat, EQuIS, Custom)	Excel and PDF	Handed over by	Stephen Maxwell	
Contact Name	Stephen Maxwell	Analyses	TRH, BTEX, PAH 8 Metlars Asbestos (Presence/Absence)	Email for Invoice	smaxwell@ramboll.com asiapac-accounts@ramboll.com			
Phone №	0478 658 194	(Note: Where metals are requested, please specify "Total" or "Filter" SUITE code must be used to reflect SUITE pricing)			Email for Results	smaxwell@ramboll.com jblackwell@ramboll.com		
Purchase Order		Turnaround Time (TAT)					Requirements (Default will be 5 days if not ticked)	
Quote ID №	180813RAMN_1	Containers					<input type="checkbox"/> Overnight (9am)* <input type="checkbox"/> 1 Day* <input type="checkbox"/> 2 Day* <input checked="" type="checkbox"/> 3 Day* <input type="checkbox"/> 5 Day* <input type="checkbox"/> Other () * Surcharges apply	

Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	TRH, BTEX, PAH	8 Metlars	Asbestos (Presence/Absence)	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4364, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
TP14_0.1	26/07/19	S	X	X	X								1	
TP15_0.1	26/07/19	S	X	X	X								1	
													1	
													1	
													1	
Total Counts			2	2	2								2	3

Method of Shipment: Courier (#) Hand Delivered Postal

Name	Signature	Date	Time	Temperature
		26/7/19	5:24PM	16.7°C
Received By	Signature	Date	Time	Report №
<i>Elvis P</i>				668044

09_R7 Modified by: Dr. R Symons Approved by: T. Lakeland Approved on: 17 August 2017
 Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

Melbourne

6 Monterey Road
Dandenong South Vic 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney

Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane

1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth

2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

Sample Receipt Advice

Company name: **Ramboll Australia Pty Ltd**

Contact name: Stephen Maxwell

Project ID: 318000780

COC number: Not provided

Turn around time: 3 Day

Date/Time received: Jul 26, 2019 5:54 PM

Eurofins reference: **668044**

Sample information

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- All samples have been received as described on the above COC.
- COC has been completed correctly.
- Attempt to chill was evident.
- Appropriately preserved sample containers have been used.
- All samples were received in good condition.
- Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- Appropriate sample containers have been used.
- Split sample sent to requested external lab.
- Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Sample TP15 0.1 not received; instead TP16_0.1 received, logged in for same analysis.

Contact notes

If you have any questions with respect to these samples please contact:

Andrew Black on Phone : (+61) 2 9900 8490 or by e.mail: AndrewBlack@eurofins.com

Results will be delivered electronically via e.mail to Stephen Maxwell - smaxwell@ramboll.com.

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668044	Due:	Jul 31, 2019
Project Name:		Phone:	02 9954 8118	Priority:	3 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	TP4 0.1-0.3	Jul 26, 2019		Soil	S19-JI39840	X	X	X
2	TP5 0.1-0.45	Jul 26, 2019		Soil	S19-JI39841	X	X	X
3	TP6 0.1-0.4	Jul 26, 2019		Soil	S19-JI39842	X	X	X
4	TP7 0.1-0.4	Jul 26, 2019		Soil	S19-JI39843	X	X	X
5	TP8 0.1-0.3	Jul 26, 2019		Soil	S19-JI39844	X	X	X
6	TP9 0.1-0.3	Jul 26, 2019		Soil	S19-JI39845	X	X	X
7	TP10 0.2	Jul 26, 2019		Soil	S19-JI39846	X	X	X
8	TP11 0.1	Jul 26, 2019		Soil	S19-JI39847	X	X	X
9	TP12 0.1	Jul 26, 2019		Soil	S19-JI39848	X	X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668044	Due:	Jul 31, 2019
Project Name:		Phone:	02 9954 8118	Priority:	3 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
10	TP13 0.1	Jul 26, 2019		Soil	S19-JI39849	X	X	X
11	TP14 0.1	Jul 26, 2019		Soil	S19-JI39850	X	X	X
12	TP16 0.1	Jul 26, 2019		Soil	S19-JI39851	X	X	X
Test Counts						12	12	12

Ramboll Environ Australia Pty Ltd
Level 3/100 Pacific Highway
North Sydney
NSW 2060



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: Stephen Maxwell
Report 668044-AID
Project Name
Project ID 318000780
Received Date Jul 26, 2019
Date Reported Jul 31, 2019

Methodology:

Asbestos Fibre
 Identification

Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.

NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral
 Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.

NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.

Subsampling Soil
 Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed.

NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.

Bonded asbestos-
 containing material
 (ACM)

The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.

NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Limit of Reporting

The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w).

The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk).

NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos". This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.

Project Name
Project ID 318000780
Date Sampled Jul 26, 2019
Report 668044-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP4 0.1-0.3	19-JI39840	Jul 26, 2019	Approximate Sample 594g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP5 0.1-0.45	19-JI39841	Jul 26, 2019	Approximate Sample 540g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP6 0.1-0.4	19-JI39842	Jul 26, 2019	Approximate Sample 65g Sample consisted of: Brown soil residue and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP7 0.1-0.4	19-JI39843	Jul 26, 2019	Approximate Sample 247g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP8 0.1-0.3	19-JI39844	Jul 26, 2019	Approximate Sample 430g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP9 0.1-0.3	19-JI39845	Jul 26, 2019	Approximate Sample 259g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP10 0.2	19-JI39846	Jul 26, 2019	Approximate Sample 59g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP11 0.1	19-JI39847	Jul 26, 2019	Approximate Sample 53g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP12 0.1	19-JI39848	Jul 26, 2019	Approximate Sample 68g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP13 0.1	19-JI39849	Jul 26, 2019	Approximate Sample 51g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP14 0.1	19-JI39850	Jul 26, 2019	Approximate Sample 66g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
TP16 0.1	19-JI39851	Jul 26, 2019	Approximate Sample 751g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jul 26, 2019	Indefinite

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668044	Due:	Jul 31, 2019
Project Name:		Phone:	02 9954 8118	Priority:	3 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	TP4 0.1-0.3	Jul 26, 2019		Soil	S19-JI39840	X	X	X
2	TP5 0.1-0.45	Jul 26, 2019		Soil	S19-JI39841	X	X	X
3	TP6 0.1-0.4	Jul 26, 2019		Soil	S19-JI39842	X	X	X
4	TP7 0.1-0.4	Jul 26, 2019		Soil	S19-JI39843	X	X	X
5	TP8 0.1-0.3	Jul 26, 2019		Soil	S19-JI39844	X	X	X
6	TP9 0.1-0.3	Jul 26, 2019		Soil	S19-JI39845	X	X	X
7	TP10 0.2	Jul 26, 2019		Soil	S19-JI39846	X	X	X
8	TP11 0.1	Jul 26, 2019		Soil	S19-JI39847	X	X	X
9	TP12 0.1	Jul 26, 2019		Soil	S19-JI39848	X	X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668044	Due:	Jul 31, 2019
Project Name:		Phone:	02 9954 8118	Priority:	3 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
10	TP13 0.1	Jul 26, 2019		Soil	S19-JI39849	X	X	X
11	TP14 0.1	Jul 26, 2019		Soil	S19-JI39850	X	X	X
12	TP16 0.1	Jul 26, 2019		Soil	S19-JI39851	X	X	X
Test Counts						12	12	12

Internal Quality Control Review and Glossary
General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to "non-bonded / friable".
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

S19-JI39842, S19-JI39846, S19-JI39847, S19-JI39848, S19-JI39849, S19-JI39850: The samples received were not collected in an approved asbestos bag and was therefore sub-sampled from the 250mL glass jar. Valid sub-sampling procedures were applied so as to ensure that the sub-samples to be analysed accurately represented the samples received.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Karthik Surisetty Senior Analyst-Asbestos (NSW)

Authorised by:

Sayeed Abu Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Ramboll Environ Australia Pty Ltd
 Level 3/100 Pacific Highway
 North Sydney
 NSW 2060



NATA Accredited
 Accreditation Number 1261
 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Stephen Maxwell**

Report **668044-S**
 Project name
 Project ID **318000780**
 Received Date **Jul 26, 2019**

Client Sample ID			TP4 0.1-0.3	TP5 0.1-0.45	TP6 0.1-0.4	TP7 0.1-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39840	S19-JI39841	S19-JI39842	S19-JI39843
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	96
TRH C15-C28	50	mg/kg	< 50	60	< 50	150
TRH C29-C36	50	mg/kg	< 50	110	< 50	120
TRH C10-36 (Total)	50	mg/kg	< 50	170	< 50	366
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	68	72	69	64
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	92
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	92
TRH >C16-C34	100	mg/kg	< 100	140	< 100	220
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	120
TRH >C10-C40 (total)*	100	mg/kg	< 100	140	< 100	432
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			TP4 0.1-0.3	TP5 0.1-0.45	TP6 0.1-0.4	TP7 0.1-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39840	S19-JI39841	S19-JI39842	S19-JI39843
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	99	108	112	112
p-Terphenyl-d14 (surr.)	1	%	105	148	INT	126
Heavy Metals						
Arsenic	2	mg/kg	47	13	11	5.8
Cadmium	0.4	mg/kg	3.3	1.1	1.0	0.7
Chromium	5	mg/kg	25	7.4	7.6	< 5
Copper	5	mg/kg	990	180	190	62
Lead	5	mg/kg	8800	1500	1300	510
Mercury	0.1	mg/kg	0.4	0.1	< 0.1	< 0.1
Nickel	5	mg/kg	8.8	< 5	< 5	< 5
Zinc	5	mg/kg	940	320	350	130
% Moisture	1	%	3.0	3.7	2.4	< 1

Client Sample ID			TP8 0.1-0.3	TP9 0.1-0.3	TP10 0.2	TP11 0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39844	S19-JI39845	S19-JI39846	S19-JI39847
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	67	74	71	66
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100

Client Sample ID			TP8 0.1-0.3	TP9 0.1-0.3	TP10 0.2	TP11 0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39844	S19-JI39845	S19-JI39846	S19-JI39847
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	115	129	118	INT
p-Terphenyl-d14 (surr.)	1	%	INT	INT	INT	INT
Heavy Metals						
Arsenic	2	mg/kg	23	8.6	6.1	6.6
Cadmium	0.4	mg/kg	1.6	1.0	< 0.4	< 0.4
Chromium	5	mg/kg	11	6.8	< 5	29
Copper	5	mg/kg	190	91	< 5	9.9
Lead	5	mg/kg	870	730	18	43
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	5.7	< 5	< 5	5.9
Zinc	5	mg/kg	320	200	17	81
% Moisture	1	%	1.1	21	9.1	10

Client Sample ID			TP12 0.1	TP13 0.1	TP14 0.1	TP16 0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39848	S19-JI39849	S19-JI39850	S19-JI39851
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	22	31	< 20
TRH C15-C28	50	mg/kg	< 50	54	89	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	80	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	76	200	< 50

Client Sample ID			TP12 0.1	TP13 0.1	TP14 0.1	TP16 0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39848	S19-JI39849	S19-JI39850	S19-JI39851
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	66	71	66	79
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	150	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	150	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	INT	INT	INT	121
p-Terphenyl-d14 (surr.)	1	%	INT	INT	INT	130
Heavy Metals						
Arsenic	2	mg/kg	< 2	9.6	< 2	2.1
Cadmium	0.4	mg/kg	< 0.4	2.1	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	8.7	< 5	< 5
Copper	5	mg/kg	< 5	21	< 5	< 5
Lead	5	mg/kg	11	39	6.4	10
Mercury	0.1	mg/kg	0.3	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	15	300	14	12
% Moisture	1	%	9.4	11	2.3	7.3

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jul 30, 2019	14 Days
BTEX - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jul 30, 2019	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jul 30, 2019	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jul 30, 2019	14 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Sydney	Jul 30, 2019	14 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Jul 30, 2019	180 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	Jul 26, 2019	14 Days

Company Name: Ramboll Australia Pty Ltd	Order No.:	Received: Jul 26, 2019 5:54 PM
Address: Level 3/100 Pacific Highway North Sydney NSW 2060	Report #: 668044	Due: Jul 31, 2019
Project Name:	Phone: 02 9954 8118	Priority: 3 Day
Project ID: 318000780	Fax: 02 9954 8150	Contact Name: Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	TP4 0.1-0.3	Jul 26, 2019		Soil	S19-JI39840	X	X	X
2	TP5 0.1-0.45	Jul 26, 2019		Soil	S19-JI39841	X	X	X
3	TP6 0.1-0.4	Jul 26, 2019		Soil	S19-JI39842	X	X	X
4	TP7 0.1-0.4	Jul 26, 2019		Soil	S19-JI39843	X	X	X
5	TP8 0.1-0.3	Jul 26, 2019		Soil	S19-JI39844	X	X	X
6	TP9 0.1-0.3	Jul 26, 2019		Soil	S19-JI39845	X	X	X
7	TP10 0.2	Jul 26, 2019		Soil	S19-JI39846	X	X	X
8	TP11 0.1	Jul 26, 2019		Soil	S19-JI39847	X	X	X
9	TP12 0.1	Jul 26, 2019		Soil	S19-JI39848	X	X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668044	Due:	Jul 31, 2019
Project Name:		Phone:	02 9954 8118	Priority:	3 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Moisture Set	Eurofins mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
10	TP13 0.1	Jul 26, 2019		Soil	S19-JI39849	X	X	X
11	TP14 0.1	Jul 26, 2019		Soil	S19-JI39850	X	X	X
12	TP16 0.1	Jul 26, 2019		Soil	S19-JI39851	X	X	X
Test Counts						12	12	12

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	74			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
TRH C10-C14	%	85			70-130	Pass		
LCS - % Recovery								
BTEX								
Benzene	%	100			70-130	Pass		
Toluene	%	96			70-130	Pass		
Ethylbenzene	%	89			70-130	Pass		
m&p-Xylenes	%	89			70-130	Pass		
o-Xylene	%	92			70-130	Pass		
Xylenes - Total	%	90			70-130	Pass		
LCS - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions								
Naphthalene	%	89			70-130	Pass		
TRH C6-C10	%	71			70-130	Pass		
TRH >C10-C16	%	84			70-130	Pass		
LCS - % Recovery								
Polycyclic Aromatic Hydrocarbons								
Acenaphthene	%	90			70-130	Pass		
Acenaphthylene	%	91			70-130	Pass		
Anthracene	%	94			70-130	Pass		
Benz(a)anthracene	%	91			70-130	Pass		
Benzo(a)pyrene	%	96			70-130	Pass		
Benzo(b&j)fluoranthene	%	92			70-130	Pass		
Benzo(g,h,i)perylene	%	96			70-130	Pass		
Benzo(k)fluoranthene	%	105			70-130	Pass		
Chrysene	%	98			70-130	Pass		
Dibenz(a,h)anthracene	%	89			70-130	Pass		
Fluoranthene	%	105			70-130	Pass		
Fluorene	%	107			70-130	Pass		
Indeno(1,2,3-cd)pyrene	%	94			70-130	Pass		
Naphthalene	%	91			70-130	Pass		
Phenanthrene	%	89			70-130	Pass		
Pyrene	%	104			70-130	Pass		
LCS - % Recovery								
Heavy Metals								
Arsenic	%	109			70-130	Pass		
Cadmium	%	99			70-130	Pass		
Chromium	%	103			70-130	Pass		
Copper	%	102			70-130	Pass		
Lead	%	105			70-130	Pass		
Mercury	%	89			70-130	Pass		
Nickel	%	104			70-130	Pass		
Zinc	%	116			70-130	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions								
TRH C10-C14	S19-JI34164	NCP	%	73		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions								
TRH >C10-C16	S19-JI34164	NCP	%	72		70-130	Pass	
Spike - % Recovery								
Polycyclic Aromatic Hydrocarbons								
Acenaphthene	S19-JI46517	NCP	%	112		70-130	Pass	
Acenaphthylene	S19-JI46517	NCP	%	106		70-130	Pass	
Anthracene	S19-JI46517	NCP	%	105		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Benz(a)anthracene	S19-JI46517	NCP	%	110		70-130	Pass	
Benzo(a)pyrene	S19-JI46517	NCP	%	108		70-130	Pass	
Benzo(b&j)fluoranthene	S19-JI46517	NCP	%	108		70-130	Pass	
Benzo(g,h,i)perylene	S19-JI46517	NCP	%	112		70-130	Pass	
Benzo(k)fluoranthene	S19-JI46517	NCP	%	118		70-130	Pass	
Chrysene	S19-JI46517	NCP	%	114		70-130	Pass	
Dibenz(a,h)anthracene	S19-JI46517	NCP	%	103		70-130	Pass	
Fluorene	S19-JI46517	NCP	%	121		70-130	Pass	
Indeno(1.2.3-cd)pyrene	S19-JI46517	NCP	%	108		70-130	Pass	
Naphthalene	S19-JI46517	NCP	%	102		70-130	Pass	
Phenanthrene	S19-JI46517	NCP	%	106		70-130	Pass	
Pyrene	S19-JI46517	NCP	%	128		70-130	Pass	
Spike - % Recovery								
Heavy Metals				Result 1				
Arsenic	S19-JI46290	NCP	%	88		70-130	Pass	
Cadmium	S19-JI46290	NCP	%	87		70-130	Pass	
Chromium	S19-JI46290	NCP	%	90		70-130	Pass	
Copper	S19-JI35169	NCP	%	76		70-130	Pass	
Lead	S19-JI46290	NCP	%	87		70-130	Pass	
Mercury	S19-JI46290	NCP	%	90		70-130	Pass	
Nickel	S19-JI46290	NCP	%	89		70-130	Pass	
Zinc	S19-JI46290	NCP	%	124		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1				
TRH C6-C9	S19-JI39848	CP	%	111		70-130	Pass	
Spike - % Recovery								
BTEX				Result 1				
Benzene	S19-JI39848	CP	%	100		70-130	Pass	
Toluene	S19-JI39848	CP	%	98		70-130	Pass	
Ethylbenzene	S19-JI39848	CP	%	91		70-130	Pass	
m&p-Xylenes	S19-JI39848	CP	%	93		70-130	Pass	
o-Xylene	S19-JI39848	CP	%	92		70-130	Pass	
Xylenes - Total	S19-JI39848	CP	%	93		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
Naphthalene	S19-JI39848	CP	%	73		70-130	Pass	
TRH C6-C10	S19-JI39848	CP	%	105		70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	S19-JI47798	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	S19-JI47798	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	S19-JI47798	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benz(a)anthracene	S19-JI47798	NCP	mg/kg	1.3	< 0.5	110	30%	Fail Q15
Benzo(a)pyrene	S19-JI47798	NCP	mg/kg	1.2	< 0.5	110	30%	Fail Q15
Benzo(b&j)fluoranthene	S19-JI47798	NCP	mg/kg	0.9	< 0.5	120	30%	Fail Q15
Benzo(g,h,i)perylene	S19-JI47798	NCP	mg/kg	0.6	< 0.5	98	30%	Fail Q15
Benzo(k)fluoranthene	S19-JI47798	NCP	mg/kg	1.1	< 0.5	110	30%	Fail Q15
Chrysene	S19-JI47798	NCP	mg/kg	1.2	< 0.5	110	30%	Fail Q15
Dibenz(a,h)anthracene	S19-JI47798	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	S19-JI47798	NCP	mg/kg	3.3	0.8	120	30%	Fail Q15
Fluorene	S19-JI47798	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1.2.3-cd)pyrene	S19-JI47798	NCP	mg/kg	0.6	< 0.5	110	30%	Fail Q15
Naphthalene	S19-JI47798	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Phenanthrene	S19-JI47798	NCP	mg/kg	1.1	< 0.5	97	30%	Fail	Q15
Pyrene	S19-JI47798	NCP	mg/kg	2.7	0.8	110	30%	Fail	Q15
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-JI46289	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	S19-JI46289	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-JI46289	NCP	mg/kg	5.1	5.4	7.0	30%	Pass	
Copper	S19-JI46289	NCP	mg/kg	210	210	<1	30%	Pass	
Lead	S19-JI46289	NCP	mg/kg	6.2	6.4	3.0	30%	Pass	
Mercury	S19-JI46289	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S19-JI46289	NCP	mg/kg	6.6	7.2	8.0	30%	Pass	
Zinc	S19-JI46289	NCP	mg/kg	51	52	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-JI48261	NCP	%	14	13	2.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S19-JI39846	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S19-JI39846	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S19-JI39846	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S19-JI39846	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S19-JI39846	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S19-JI39846	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S19-JI39847	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S19-JI39847	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S19-JI39847	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S19-JI39847	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S19-JI39847	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S19-JI39847	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S19-JI39847	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S19-JI39847	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S19-JI39847	CP	mg/kg	< 20	< 20	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins mg'ts QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Andrew Black	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.



CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

Sydney Laboratory
Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2056
02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1, 21 Smallwood Pl., Murarie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company		Ramboll		Project No		318000780		Project Manager		Stephen Maxwell		Sampler(s)		SM and SC			
Address		50 Glebe Road the Junction		Project Name				EDD Format (ESdat, EQUIS, Custom)		Excel and PDF		Handed over by		Stephen Maxwell			
Contact Name		Stephen Maxwell		Analyses <small>Note: Where metals are requested, please specify 'Total' or 'Filtered'. SUITE code must be used to attract SUITE pricing.</small>		Lead								Email for Invoice		smaxwell@ramboll.com asiapac-accounts@ramboll.com	
Phone No		0478 658 194												Email for Results		smaxwell@ramboll.com jblackwell@ramboll.com	
Special Directions														Containers		Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)	
Purchase Order														1L Plastic		<input type="checkbox"/> Overnight (9am)*	
Quote ID No		180813RAMN_1		250mL Plastic		<input checked="" type="checkbox"/> 1 Day* <input type="checkbox"/> 2 Day*											
				125mL Plastic		<input type="checkbox"/> 3 Day* <input type="checkbox"/> 5 Day*											
				200mL Amber Glass		<input type="checkbox"/> Other ()											
				40mL VOA vial		Sample Comments / Dangerous Goods Hazard Warning											
				500mL PFAS Bottle													
				Jar (Glass or HDPE)													
				Other (Asbestos / AS964, WA Guidelines)													
No	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))														
1	TP1_0.1-0.5	26/07/19	S	X													
2	TP1_0.5-0.6	26/07/19	S	X													
3	TP2_0.1-0.4	26/07/19	S	X													
4	TP2_0.4-0.5	26/07/19	S	X													
5	TP2_0.5-0.7	26/07/19	S	X													
6	TP3_0.1-0.5	26/07/19	S	X													
7	TP3_0.5-0.6	26/07/19	S	X													
8	TP3_0.6-0.7	26/07/19	S	X													
9	TP4_0.1-0.3	26/07/19	S	X								1	1	Asbestos bag for analysis			
10	TP4_0.3-0.4	26/07/19	S	X								1					
Total Counts				10								10	1				
Method of Shipment		<input type="checkbox"/> Courier (#) <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		Name		Signature		Date		Time		Date		Time			
Eurofins mgt Laboratory Use Only		Received By <i>Elvio P</i>		SYD BNE MEL PER ADL NTL DRW		Signature <i>[Signature]</i>		Date 26/7/19		Time 5:50AM		Temperature 16.7°C		Report No 668047			
		Received By		SYD BNE MEL PER ADL NTL DRW		Signature		Date		Time		Report No					

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

QSS306_R7 Modified by: Dr. R Symons Approved by: T. Lelaland Approved on: 17 August 2017



CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

Sydney Laboratory
Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1, 21 Smallwood Pl., Murarrie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9800 EnviroSampleWA@eurofins.com

Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company		Ramboll		Project No		318000780		Project Manager		Stephen Maxwell		Sampler(s)		SM and SC			
Address		50 Glebe Road the Junction		Project Name				EDD Format (ESdat, EQUIS, Custom)		Excel and PDF		Handed over by		Stephen Maxwell			
Contact Name		Stephen Maxwell		<small>Analysis</small> <small>(Note: Where metals are requested, please specify "Total" or "Filtered" SUITE code must be used to attract SUITE pricing.)</small> Lead								Email for Invoice		smaxwell@ramboll.com asiapac-accounts@ramboll.com			
Phone No		0478 658 194												Email for Results		smaxwell@ramboll.com jblackwell@ramboll.com	
Special Directions														Turnaround Time (TAT) Requirements (Default will be 5 days if not stated)		<input type="checkbox"/> Overnight (9am)* <input checked="" type="checkbox"/> 1 Day* <input type="checkbox"/> 2 Day* <input type="checkbox"/> 3 Day* <input type="checkbox"/> 5 Day* <input type="checkbox"/> Other () *Surcharges apply	
Purchase Order														Containers		1L Plastic 250mL Plastic 125mL Plastic 200mL Amber Glass 40mL VOA vial 500mL PFAS Bottle Jar (Glass or HDPE) <small>Other (Asbestos AS4964, WA Guidelines)</small>	
Quote ID No		180813RAMN_1												Sample Comments / Dangerous Goods Hazard Warning			
No	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))														
1	TP5-0.1-0.45	26/07/19	S	X										1	1		
2	TP5_0.45-0.55	26/07/19	S	X										1			
3	TP5_0.6-0.7	26/07/19	S	X										1			
4	TP6_0.1-0.4	26/07/19	S	X										1	1		
5	TP6_0.4-0.5	26/07/19	S	X										1			
6	TP6_0.5-0.7	26/07/19	S	X										1			
7	TP7_0.1-0.4	26/07/19	S	X										1	1		
8	TP7_0.4-0.5	26/07/19	S	X										1			
9	TP7_0.5-0.7	26/07/19	S	X										1			
10	TP8_0.1-0.3	26/07/19	S	X										1	1		
Total Counts					10									10	4		
Method of Shipment		<input type="checkbox"/> Courier (#) <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		Name		Signature		Date		Time		Date		Time			
Eurofins mgt Laboratory Use Only		Received By <i>Eliso</i>		SYD BNE MEL PER ADL NTL DRW		<i>[Signature]</i>		Date 26/7/19		Time 5:04pm		Temperature 16.9°C		Report No			
		Received By		SYD BNE MEL PER ADL NTL DRW		Signature		Date		Time							

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt



CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

Sydney Laboratory
Unit F3 Bid.F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9500 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1, 21 Smallwood Pl., Murarie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVIC@eurofins.com

Company		Ramboll		Project No		318000780		Project Manager		Stephen Maxwell		Sampler(s)		SM and SC			
Address		50 Glebe Road the Junction		Project Name				EDD Format (ESdat, EQuIS, Custom)		Excel and PDF		Handed over by		Stephen Maxwell			
Contact Name		Stephen Maxwell		Analysis <small>(Note: Where capitals are requested, please specify "Total" or "Filler" (SUIE code must be used to attract SUIE pricing).</small>		Lead						Email for Invoice		smaxwell@ramboll.com asiapac-accounts@ramboll.com			
Phone No		0478 658 194										Email for Results		smaxwell@ramboll.com jblackwell@ramboll.com			
Special Directions														Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)		<input type="checkbox"/> Overnight (9am)* <input checked="" type="checkbox"/> 1 Day* <input type="checkbox"/> 2 Day* <input type="checkbox"/> 3 Day* <input type="checkbox"/> 5 Day* <input type="checkbox"/> Other () * Surcharges apply	
Purchase Order																Containers	
Quote ID No		180813RAMN_1												Sample Comments / Dangerous Goods Hazard Warning			
No	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))														
1	TP80.3-0.5	26/07/19	S	X										1			
2	TP8_0.5-0.8	26/07/19	S	X										1			
3	TP9_0.1-0.3	26/07/19	S	X										1 1			
4	TP9_0.3-0.5	26/07/19	S	X										1			
5	TP9_0.5-0.7	26/07/19	S	X										1			
6	TP15_0.1	26/07/19	S	X										1			
7	TP15_0.8	26/07/19	S	X										1			
8	SS1_0.0-0.1	26/07/19	S	X										1			
9																	
10																	
Total Counts				8										8 1			
Method of Shipment		<input type="checkbox"/> Courier (#) <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		Name		Signature		Date		Date		Time		Time			
Eurofins mgt Laboratory Use Only		Received By		SYD BNE MEL PER ADL NTL DRW		Signature		Date		Date		Time		Temperature			
		Received By		SYD BNE MEL PER ADL NTL DRW		Signature		Date		Date		Time		Report No			

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt



CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

Sydney Laboratory
Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9600 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1, 21 Smallwood Pl., Murarie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVc@eurofins.com

Company		Ramboll		Project No	318000780				Project Manager	Stephen Maxwell				Sampler(s)	SM and SC			
Address		50 Glebe Road the Junction		Project Name				EDD Format (ESdat, EQUS, Custom)				Excel and PDF				Handed over by	Stephen Maxwell	
Contact Name		Stephen Maxwell		Analysis Code (Note: Where initials are requested, please specify "Initial" or "Filler" or "SITE" code must be used to attract SUITE pricing)	Lead									Email for Invoice	smaxwell@ramboll.com asiapac-accounts@ramboll.com			
Phone No		0478 658 194												Email for Results	smaxwell@ramboll.com jblackwell@ramboll.com			
Special Directions														Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)				
Purchase Order														Containers				
Quote ID No		180813RAMN_1										1L Plastic		Overnight (9am)*				
No	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))									250mL Plastic		1 Day*				
												125mL Plastic		2 Day*				
												200mL Amber Glass		3 Day*				
												40mL VOA Vial		5 Day*				
												500mL PFAS Bottle		Other ()				
												Jar (Glass or HDPE)		Sample Comments / Dangerous Goods Hazard Warning				
												Other (Asbestos AS4684, WA Guidelines)						
Total Counts				10								10						
1	SS2_0-0.1	26/07/19	S	X														
2	SS3-0-0.1	26/07/19	S	X														
3	SS4_0-0.1	26/07/19	S	X														
4	SS5_0-0.1	26/07/19	S	X														
5	SS6_0-0.1	26/07/19	S	X														
6	SS7_0-0.1	26/07/19	S	X														
7	SS8_0-0.1	26/07/19	S	X														
8	SS9_0-0.1	26/07/19	S	X														
9	SS10_0-0.1	26/07/19	S	X														
10	SS11_0-0.1	26/07/19	S	X														

Method of Shipment	<input type="checkbox"/> Courier (#)	<input checked="" type="checkbox"/> Hand Delivered	<input type="checkbox"/> Postal	Name	Signature	Date	Time
Eurofins mgt Laboratory Use Only	Received By	<i>[Signature]</i>	SYD BNE MEL PER ADL NTL DRW	Signature	<i>[Signature]</i>	Date	Time
	Received By		SYD BNE MEL PER ADL NTL DRW	Signature		Date	Time

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt



CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

Sydney Laboratory
Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1, 21 Smallwood Pl., Murarrie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company		Ramboll		Project No		318000780		Project Manager		Stephen Maxwell		Sampler(s)		SM and SC			
Address		50 Glebe Road the Junction		Project Name				EDD Format (ESdat, EQuIS, Custom)		Excel and PDF		Handed over by		Stephen Maxwell			
Contact Name		Stephen Maxwell		Analyses <small>(Note: Where metals are requested, please specify "Total" or "Filtered" SUITE code must be used to attract SUITE pricing.)</small> Lead								Email for Invoice		smaxwell@ramboll.com asiapac-accounts@ramboll.com			
Phone No		0478 658 194												Email for Results		smaxwell@ramboll.com cgoodbody@ramboll.com	
Special Directions														Turnaround Time (TAT) Requirements (default will be 5 days if not ticked)		<input type="checkbox"/> Overnight (9am)* <input checked="" type="checkbox"/> 1 Day* <input type="checkbox"/> 2 Day* <input type="checkbox"/> 3 Day* <input type="checkbox"/> 5 Day* <input type="checkbox"/> Other () * Surcharges apply	
Purchase Order														Containers		Sample Comments / Dangerous Goods Hazard Warning	
Quote ID No		180813RAMN_1										1L Plastic 250mL Plastic 125mL Plastic 200mL Amber Glass 40mL VOA vial 500mL PFAS Bottle Jar (Glass or HDPE) Other (Asbestos AS4964, WA Qualitates)					
No.	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))														
1	SS12_0-0.1	26/07/19	S	X										1			
2	SS13_0-0.1	26/07/19	S	X										1			
3	SS14_0-0.1	26/07/19	S	X										1			
4	SS15_0-0.1	26/07/19	S	X										1			
5	SS16_0-0.1	26/07/19	S	X										1			
6																	
7	D02_260719	26/07/19	S	X										1			
8	D03_260719	26/07/19	S	X										1			
9	T02_260719	26/07/19	S	X										1	Please send to Envirolab for analysis		
10	T03_260719	26/07/19	S	X										1	Please send to Envirolab for analysis		
Total Counts				9										9			
Method of Shipment		<input type="checkbox"/> Courier (#) <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		Name		Signature		Date		Time		Date		Time			
Eurofins mgt Laboratory Use Only		Received By <i>FNIS</i>		SYD BNE MEL PER ADL NTL DRW		Signature <i>[Signature]</i>		Date 26/7/19		Time 5:54pm		Temperature 16.7C		Report No			
		Received By		SYD BNE MEL PER ADL NTL DRW		Signature		Date		Time							

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

Enviro Sample NSW

From: Stephen Maxwell <SMAXWELL@ramboll.com>
Sent: Monday, 29 July 2019 9:08 AM
To: Enviro Sample NSW
Cc: Joshua Blackwell
Subject: RE: Eurofins | mgt Sample Receipt Advice - Report 668047 : Site 318000780

Follow Up Flag: Follow up
Flag Status: Flagged

Hi

Please report TP16 0.1 & TP16 0.8 as TP15 0.1 & TP15 0.8 (these were labelled out of sequence in the field).

Please analyse SS17_0-0.1, SS18_0.0-0.1, SS19_0.0-0.1 SS20_0.0-0.1, SS21, SS22 for lead on fastest available turnaround. {Please hold bags for SS15, SS16, SS19 and SS20.

Please hold all other samples described in **red** in trail below.

Kind regards

Stephen Maxwell
Lead Consultant

D +61 478658194
M +61 478658194
smaxwell@ramboll.com

Ramboll Australia Pty Ltd.
ACN 095 437 442
ABN 49 095 437 442

From: EnviroSampleNSW@eurofins.com <EnviroSampleNSW@eurofins.com>
Sent: 26 July, 2019 7:20 PM
To: Stephen Maxwell <SMAXWELL@ramboll.com>
Cc: Joshua Blackwell <JBLACKWELL@ramboll.com>
Subject: Eurofins | mgt Sample Receipt Advice - Report 668047 : Site 318000780

Dear Valued Client,

T02_260719(jar+bag) & T03_260719(jar) to be sent to Envirolab for analysis.

Sample TP15 0.1 & TP15 0.8 not received; analysis cancelled. Additional samples TP16 0.1 & TP16 0.8 received and placed on analysis.

Extra samples received, TP10_0.8-1.0, TP11_0.5-0.6, TP11_0.8-1.0, TP12_0.5, TP13_0.5-0.6, TP13_0.8-0.9, TP14_0.6-0.8, SS17_0.0-0.1, SS18_0.0-0.1 - ALL JARS.

**SS19_0.0-0.1(JAR+2BAGS), SS20_0.0-0.1(JAR+2 BAGS), SS21(BAG), SS22(BAG), all placed on HOLD.
Please advise further instructions.**

Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins Analytical Services Manager as soon as possible to make certain that they get changed.

Regards

Rupan Virk
Sample Receipt

Eurofins | Environment Testing

Unit F3, Parkview Building

16 Mars Road

LANE COVE WEST NSW 2066

AUSTRALIA

Phone: +61 299 008 400

Email: EnviroSampleNSW@eurofins.com

Website: environment.eurofins.com.au

[EnviroNote 1068 - Eurofins Perth Laboratory](#)

[EnviroNote 1069 - Eurofins Overnight TAT](#)

[EnviroNote 1079 - PFAS Fingerprinting](#)

[EnviroNote 1080 - Total Organofluorine Analysis & PFAS Investigations](#)

Click [here](#) to report this email as spam.

ScannedByWebsenseForEurofins

Melbourne

6 Monterey Road
Dandenong South Vic 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney

Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane

1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth

2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

Sample Receipt Advice

Company name: **Ramboll Australia Pty Ltd**

Contact name: **Stephen Maxwell**

Project ID: **318000780**

COC number: **Not provided**

Turn around time: **1 Day**

Date/Time received: **Jul 26, 2019 5:54 PM**

Eurofins reference: **668047**

Sample information

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- All samples have been received as described on the above COC.
- COC has been completed correctly.
- Attempt to chill was evident.
- Appropriately preserved sample containers have been used.
- All samples were received in good condition.
- Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- Appropriate sample containers have been used.
- Split sample sent to requested external lab.
- Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Andrew Black on Phone : (+61) 2 9900 8490 or by e.mail: AndrewBlack@eurofins.com

Results will be delivered electronically via e.mail to Stephen Maxwell - smaxwell@ramboll.com.

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	TP1 0.1-0.5	Jul 26, 2019		Soil	S19-JI39891		X	X
2	TP1 0.5-0.6	Jul 26, 2019		Soil	S19-JI39892		X	X
3	TP2 0.1-0.4	Jul 26, 2019		Soil	S19-JI39893		X	X
4	TP2 0.4-0.5	Jul 26, 2019		Soil	S19-JI39894		X	X
5	TP2 0.5-0.7	Jul 26, 2019		Soil	S19-JI39895		X	X
6	TP3 0.1-0.5	Jul 26, 2019		Soil	S19-JI39896		X	X
7	TP3 0.5-0.6	Jul 26, 2019		Soil	S19-JI39897		X	X
8	TP3 0.6-0.7	Jul 26, 2019		Soil	S19-JI39898		X	X
9	TP4 0.1-0.3	Jul 26, 2019		Soil	S19-JI39899		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
10	TP4 0.3-0.4	Jul 26, 2019		Soil	S19-JI39900		X	X
11	TP5 0.1-0.45	Jul 26, 2019		Soil	S19-JI39901		X	X
12	TP5 0.45-0.55	Jul 26, 2019		Soil	S19-JI39902		X	X
13	TP5 0.6-0.7	Jul 26, 2019		Soil	S19-JI39903		X	X
14	TP6 0.1-0.4	Jul 26, 2019		Soil	S19-JI39904		X	X
15	TP6 0.4-0.5	Jul 26, 2019		Soil	S19-JI39905		X	X
16	TP6 0.5-0.7	Jul 26, 2019		Soil	S19-JI39906		X	X
17	TP7 0.1-0.4	Jul 26, 2019		Soil	S19-JI39907		X	X
18	TP7 0.4-0.5	Jul 26, 2019		Soil	S19-JI39908		X	X
19	TP7 0.5-0.7	Jul 26, 2019		Soil	S19-JI39909		X	X
20	TP8 0.1-0.3	Jul 26, 2019		Soil	S19-JI39910		X	X
21	TP8 0.3-0.5	Jul 26, 2019		Soil	S19-JI39911		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
22	TP8 0.5-0.8	Jul 26, 2019		Soil	S19-JI39912		X	X
23	TP9 0.1-0.3	Jul 26, 2019		Soil	S19-JI39913		X	X
24	TP9 0.3-0.5	Jul 26, 2019		Soil	S19-JI39914		X	X
25	TP9 0.5-0.7	Jul 26, 2019		Soil	S19-JI39915		X	X
26	TP15 0.1	Jul 26, 2019		Soil	S19-JI39918		X	X
27	TP15 0.8	Jul 26, 2019		Soil	S19-JI39919		X	X
28	SS1 0.0-0.1	Jul 26, 2019		Soil	S19-JI39920		X	X
29	SS2 0.0-0.1	Jul 26, 2019		Soil	S19-JI39921		X	X
30	SS3 0.0-0.1	Jul 26, 2019		Soil	S19-JI39922		X	X
31	SS4 0.0-0.1	Jul 26, 2019		Soil	S19-JI39923		X	X
32	SS5 0.0-0.1	Jul 26, 2019		Soil	S19-JI39924		X	X
33	SS6 0.0-0.1	Jul 26, 2019		Soil	S19-JI39925		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
34	SS7 0.0-0.1	Jul 26, 2019		Soil	S19-JI39926		X	X
35	SS8 0.0-0.1	Jul 26, 2019		Soil	S19-JI39927		X	X
36	SS9 0.0-0.1	Jul 26, 2019		Soil	S19-JI39928		X	X
37	SS10 0.0-0.1	Jul 26, 2019		Soil	S19-JI39929		X	X
38	SS11 0.0-0.1	Jul 26, 2019		Soil	S19-JI39930		X	X
39	SS12 0.0-0.1	Jul 26, 2019		Soil	S19-JI39931		X	X
40	SS13 0.0-0.1	Jul 26, 2019		Soil	S19-JI39932		X	X
41	SS14 0.0-0.1	Jul 26, 2019		Soil	S19-JI39933		X	X
42	SS15 0.0-0.1	Jul 26, 2019		Soil	S19-JI39934		X	X
43	SS16 0.0-0.1	Jul 26, 2019		Soil	S19-JI39935		X	X
44	D02_260719	Jul 26, 2019		Soil	S19-JI39936		X	X
45	D03_260719	Jul 26, 2019		Soil	S19-JI39937		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
46	TP10_0.8-1.0	Jul 26, 2019		Soil	S19-JI39990	X		
47	TP11_0.5-0.6	Jul 26, 2019		Soil	S19-JI39991	X		
48	TP11_0.8-1.0	Jul 26, 2019		Soil	S19-JI39992	X		
49	TP12_0.5	Jul 26, 2019		Soil	S19-JI39993	X		
50	TP13_0.5-0.6	Jul 26, 2019		Soil	S19-JI39994	X		
51	TP13_0.8-0.9	Jul 26, 2019		Soil	S19-JI39995	X		
52	TP14_0.6-0.8	Jul 26, 2019		Soil	S19-JI39996	X		
53	SS17_0.0-0.1	Jul 26, 2019		Soil	S19-JI39997		X	X
54	SS18_0.0-0.1	Jul 26, 2019		Soil	S19-JI39998		X	X
55	SS19_0.0-0.1	Jul 26, 2019		Soil	S19-JI39999		X	X
56	SS20_0.0-0.1	Jul 26, 2019		Soil	S19-JI40000		X	X
57	SS21	Jul 26, 2019		Soil	S19-JI40001		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell
Eurofins Analytical Services Manager : Andrew Black					

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
58	SS22	Jul 26, 2019		Soil	S19-JI40002		X	X
59	D01_260719	Jul 26, 2019		Soil	S19-JI40003	X		
Test Counts						8	51	51

Ramboll Environ Australia Pty Ltd
 Level 3/100 Pacific Highway
 North Sydney
 NSW 2060



NATA Accredited
 Accreditation Number 1261
 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: Stephen Maxwell

Report 668047-S
 Project name
 Project ID 318000780
 Received Date Jul 26, 2019

Client Sample ID			TP1 0.1-0.5	TP1 0.5-0.6	TP2 0.1-0.4	TP2 0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39891	S19-JI39892	S19-JI39893	S19-JI39894
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	4400	10	3500	110
% Moisture	1	%	3.9	4.8	2.7	4.4

Client Sample ID			TP2 0.5-0.7	TP3 0.1-0.5	TP3 0.5-0.6	TP3 0.6-0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39895	S19-JI39896	S19-JI39897	S19-JI39898
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	16	29000	74	13
% Moisture	1	%	9.2	9.8	6.4	9.1

Client Sample ID			TP4 0.1-0.3	TP4 0.3-0.4	TP5 0.1-0.45	TP5 0.45-0.55
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39899	S19-JI39900	S19-JI39901	S19-JI39902
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	38000	70	3100	150
% Moisture	1	%	4.2	8.4	5.6	5.4

Client Sample ID			TP5 0.6-0.7	TP6 0.1-0.4	TP6 0.4-0.5	TP6 0.5-0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39903	S19-JI39904	S19-JI39905	S19-JI39906
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	47	6000	20	6.7
% Moisture						
	1	%	12	5.8	6.5	11

Client Sample ID			TP7 0.1-0.4	TP7 0.4-0.5	TP7 0.5-0.7	TP8 0.1-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39907	S19-JI39908	S19-JI39909	S19-JI39910
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	3300	76	6.9	2800
% Moisture						
	1	%	3.7	5.7	11	2.2

Client Sample ID			TP8 0.3-0.5	TP8 0.5-0.8	TP9 0.1-0.3	TP9 0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39911	S19-JI39912	S19-JI39913	S19-JI39914
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	24	22	600	< 5
% Moisture						
	1	%	6.0	9.5	2.4	6.1

Client Sample ID			TP9 0.5-0.7	TP15 0.1	TP15 0.8	SS1 0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39915	S19-JI39918	S19-JI39919	S19-JI39920
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	8.1	27	26	39
% Moisture						
	1	%	10	6.1	12	4.6

Client Sample ID			SS2 0.0-0.1	SS3 0.0-0.1	SS4 0.0-0.1	SS5 0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39921	S19-JI39922	S19-JI39923	S19-JI39924
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	110	130	120	43
% Moisture						
	1	%	3.2	7.5	5.6	2.8

Client Sample ID			SS6 0.0-0.1	SS7 0.0-0.1	SS8 0.0-0.1	SS9 0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39925	S19-JI39926	S19-JI39927	S19-JI39928
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	110	4100	340	140
% Moisture						
	1	%	2.8	4.4	19	6.2

Client Sample ID			SS10 0.0-0.1	SS11 0.0-0.1	SS12 0.0-0.1	SS13 0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39929	S19-JI39930	S19-JI39931	S19-JI39932
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	780	2200	32000	2600
% Moisture						
	1	%	2.2	5.8	3.3	1.2

Client Sample ID			SS14 0.0-0.1	SS15 0.0-0.1	SS16 0.0-0.1	D02_260719
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39933	S19-JI39934	S19-JI39935	S19-JI39936
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	31	350	15000	280
% Moisture						
	1	%	6.8	4.7	1.9	5.0

Client Sample ID			D03_260719	SS17_0.0-0.1	SS18_0.0-0.1	SS19_0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI39937	S19-JI39997	S19-JI39998	S19-JI39999
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	120	25	34	26000
% Moisture						
	1	%	5.5	3.2	4.8	2.4

Client Sample ID			SS20_0.0-0.1	SS21	SS22
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S19-JI40000	S19-JI40001	S19-JI40002
Date Sampled			Jul 26, 2019	Jul 26, 2019	Jul 26, 2019
Test/Reference	LOR	Unit			
Heavy Metals					
Lead	5	mg/kg	35000	610	540
% Moisture					
	1	%	3.6	2.2	3.4

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Jul 29, 2019	180 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	Jul 29, 2019	14 Days

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	TP1 0.1-0.5	Jul 26, 2019		Soil	S19-JI39891		X	X
2	TP1 0.5-0.6	Jul 26, 2019		Soil	S19-JI39892		X	X
3	TP2 0.1-0.4	Jul 26, 2019		Soil	S19-JI39893		X	X
4	TP2 0.4-0.5	Jul 26, 2019		Soil	S19-JI39894		X	X
5	TP2 0.5-0.7	Jul 26, 2019		Soil	S19-JI39895		X	X
6	TP3 0.1-0.5	Jul 26, 2019		Soil	S19-JI39896		X	X
7	TP3 0.5-0.6	Jul 26, 2019		Soil	S19-JI39897		X	X
8	TP3 0.6-0.7	Jul 26, 2019		Soil	S19-JI39898		X	X
9	TP4 0.1-0.3	Jul 26, 2019		Soil	S19-JI39899		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
10	TP4 0.3-0.4	Jul 26, 2019		Soil	S19-JI39900		X	X
11	TP5 0.1-0.45	Jul 26, 2019		Soil	S19-JI39901		X	X
12	TP5 0.45-0.55	Jul 26, 2019		Soil	S19-JI39902		X	X
13	TP5 0.6-0.7	Jul 26, 2019		Soil	S19-JI39903		X	X
14	TP6 0.1-0.4	Jul 26, 2019		Soil	S19-JI39904		X	X
15	TP6 0.4-0.5	Jul 26, 2019		Soil	S19-JI39905		X	X
16	TP6 0.5-0.7	Jul 26, 2019		Soil	S19-JI39906		X	X
17	TP7 0.1-0.4	Jul 26, 2019		Soil	S19-JI39907		X	X
18	TP7 0.4-0.5	Jul 26, 2019		Soil	S19-JI39908		X	X
19	TP7 0.5-0.7	Jul 26, 2019		Soil	S19-JI39909		X	X
20	TP8 0.1-0.3	Jul 26, 2019		Soil	S19-JI39910		X	X
21	TP8 0.3-0.5	Jul 26, 2019		Soil	S19-JI39911		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
22	TP8 0.5-0.8	Jul 26, 2019		Soil	S19-JI39912		X	X
23	TP9 0.1-0.3	Jul 26, 2019		Soil	S19-JI39913		X	X
24	TP9 0.3-0.5	Jul 26, 2019		Soil	S19-JI39914		X	X
25	TP9 0.5-0.7	Jul 26, 2019		Soil	S19-JI39915		X	X
26	TP15 0.1	Jul 26, 2019		Soil	S19-JI39918		X	X
27	TP15 0.8	Jul 26, 2019		Soil	S19-JI39919		X	X
28	SS1 0.0-0.1	Jul 26, 2019		Soil	S19-JI39920		X	X
29	SS2 0.0-0.1	Jul 26, 2019		Soil	S19-JI39921		X	X
30	SS3 0.0-0.1	Jul 26, 2019		Soil	S19-JI39922		X	X
31	SS4 0.0-0.1	Jul 26, 2019		Soil	S19-JI39923		X	X
32	SS5 0.0-0.1	Jul 26, 2019		Soil	S19-JI39924		X	X
33	SS6 0.0-0.1	Jul 26, 2019		Soil	S19-JI39925		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
34	SS7 0.0-0.1	Jul 26, 2019		Soil	S19-JI39926		X	X
35	SS8 0.0-0.1	Jul 26, 2019		Soil	S19-JI39927		X	X
36	SS9 0.0-0.1	Jul 26, 2019		Soil	S19-JI39928		X	X
37	SS10 0.0-0.1	Jul 26, 2019		Soil	S19-JI39929		X	X
38	SS11 0.0-0.1	Jul 26, 2019		Soil	S19-JI39930		X	X
39	SS12 0.0-0.1	Jul 26, 2019		Soil	S19-JI39931		X	X
40	SS13 0.0-0.1	Jul 26, 2019		Soil	S19-JI39932		X	X
41	SS14 0.0-0.1	Jul 26, 2019		Soil	S19-JI39933		X	X
42	SS15 0.0-0.1	Jul 26, 2019		Soil	S19-JI39934		X	X
43	SS16 0.0-0.1	Jul 26, 2019		Soil	S19-JI39935		X	X
44	D02_260719	Jul 26, 2019		Soil	S19-JI39936		X	X
45	D03_260719	Jul 26, 2019		Soil	S19-JI39937		X	X

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Jul 26, 2019 5:54 PM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	668047	Due:	Jul 29, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
46	TP10_0.8-1.0	Jul 26, 2019		Soil	S19-JI39990	X		
47	TP11_0.5-0.6	Jul 26, 2019		Soil	S19-JI39991	X		
48	TP11_0.8-1.0	Jul 26, 2019		Soil	S19-JI39992	X		
49	TP12_0.5	Jul 26, 2019		Soil	S19-JI39993	X		
50	TP13_0.5-0.6	Jul 26, 2019		Soil	S19-JI39994	X		
51	TP13_0.8-0.9	Jul 26, 2019		Soil	S19-JI39995	X		
52	TP14_0.6-0.8	Jul 26, 2019		Soil	S19-JI39996	X		
53	SS17_0.0-0.1	Jul 26, 2019		Soil	S19-JI39997		X	X
54	SS18_0.0-0.1	Jul 26, 2019		Soil	S19-JI39998		X	X
55	SS19_0.0-0.1	Jul 26, 2019		Soil	S19-JI39999		X	X
56	SS20_0.0-0.1	Jul 26, 2019		Soil	S19-JI40000		X	X
57	SS21	Jul 26, 2019		Soil	S19-JI40001		X	X

Company Name: Ramboll Australia Pty Ltd	Order No.:	Received: Jul 26, 2019 5:54 PM
Address: Level 3/100 Pacific Highway North Sydney NSW 2060	Report #: 668047	Due: Jul 29, 2019
	Phone: 02 9954 8118	Priority: 1 Day
	Fax: 02 9954 8150	Contact Name: Stephen Maxwell
Project Name:		
Project ID: 318000780		

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						HOLD	Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
58	SS22	Jul 26, 2019		Soil	S19-JI40002		X	X
59	D01_260719	Jul 26, 2019		Soil	S19-JI40003	X		
Test Counts						8	51	51

Internal Quality Control Review and Glossary
General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code				
Method Blank														
Heavy Metals														
Lead				mg/kg	< 5			5	Pass					
LCS - % Recovery														
Heavy Metals														
Lead				%	127			70-130	Pass					
Test	Lab Sample ID	QA Source	Units	Result 1				Acceptance Limits	Pass Limits	Qualifying Code				
Spike - % Recovery														
Heavy Metals														
Lead				S19-JI39895	CP	%	Result 1	119	70-130	Pass				
Test	Lab Sample ID	QA Source	Units	Result 1				Acceptance Limits	Pass Limits	Qualifying Code				
Duplicate														
Heavy Metals														
Lead				S19-JI39894	CP	mg/kg	Result 1	110	Result 2	92	RPD	19	30%	Pass
Duplicate														
Heavy Metals														
% Moisture				S19-JI39896	CP	%	Result 1	9.8	Result 2	9.4	RPD	5.0	30%	Pass
Duplicate														
Heavy Metals														
Lead				S19-JI39904	CP	mg/kg	Result 1	6000	Result 2	6600	RPD	10	30%	Pass
Duplicate														
Heavy Metals														
% Moisture				S19-JI39906	CP	%	Result 1	11	Result 2	11	RPD	4.0	30%	Pass
Duplicate														
Heavy Metals														
Lead				S19-JI39914	CP	mg/kg	Result 1	< 5	Result 2	< 5	RPD	< 1	30%	Pass
Duplicate														
Heavy Metals														
% Moisture				S19-JI39918	CP	%	Result 1	6.1	Result 2	5.5	RPD	10	30%	Pass
Duplicate														
Heavy Metals														
% Moisture				S19-JI39928	CP	%	Result 1	6.2	Result 2	5.2	RPD	17	30%	Pass
Duplicate														
Heavy Metals														
% Moisture				S19-JI39997	CP	%	Result 1	3.2	Result 2	3.8	RPD	17	30%	Pass

Comments
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Andrew Black	Analytical Services Manager
Gabriele Cordero	Senior Analyst-Metal (NSW)


**Glenn Jackson
General Manager**

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.



CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

Sydney Laboratory
Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2056
02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1, 21 Smallwood Pl., Murarie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company		RAMBOLL		Project No		318000780		Project Manager		STEVE MAXWELL			
Address		6665 RD THE JUNCTION NSW 2291		Project Name		-		Report Format		PDF & EXCEL			
Contact Name		STEVE MAXWELL		Analysis (Note: Where matrix are requested, please specify "Total" or "Filtered") PH GREEN METALS (P.SOURCE) PH EC, TDS, RSSTUBILITY LEAD						Relinquished by		STEVE MAXWELL	
Phone No		0478658194								Email for Results		smaxwell@ramboll.com	
Special Direction		SOIL MAT								Containers		Turn Around Requirements	
Purchase Order		-								<input type="checkbox"/> Overnight (9am)* <input checked="" type="checkbox"/> 1 Day* <input type="checkbox"/> 2 Day* <input type="checkbox"/> 3 Day* <input type="checkbox"/> 5 Day* <input type="checkbox"/> Other () <small>* Surcharges apply</small>			
Quote ID No													
No	Client Sample ID	Date	Matrix	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	var	Other ()	Sample Comments / DG Hazard Warning	
1	SO3 UP	13/8/19	WATER										
2	SS 23	12/8/19	SOIL										
3	SS 24	↓											
4	SS 25												
5	SS 26												
6	SS 27												
7	SS 28												
8	SS 29												
9	SS 30												
10	DOE-120819												
Total Counts													

Method of Shipment		<input type="checkbox"/> Courier (#) <input type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		Name		Signature		Date		Time	
Laboratory Use Only		Received By <u>Graeme Tunnell</u>		SYD BNE MEL PER ADL NEW DAR		Signature <u>[Signature]</u>		Date <u>13.8.19</u>		Time <u>12.13</u>	
		Received By		SYD BNE MEL PER ADL NEW DAR		Signature		Date		Temperature <u>6.87</u>	
										Report No <u>670968</u>	

P1/2



CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

Sydney Laboratory
Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1, 21 Smallwood Pl., Murarie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company		Project No		Project Manager		Relinquished by													
Address		Project Name		Report Format		_____													
Contact Name		Analysis <small>(Note where multiple are requested, please specify "Total" or "Element")</small> TPH BTEX, 8 METALS (D-SOLVED) PH, EL, TDS, TS, TOC, SS, TIT BTEX C6-C9 LEAD		Email for Results		_____													
Phone No				Containers		Turn Around Requirements													
Special Direction				1 L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL Vial	125mL Amber Glass	Jar	Other ()	<input type="checkbox"/> Overnight (9am)* <input type="checkbox"/> 1 Day* <input type="checkbox"/> 2 Day* <input type="checkbox"/> 3 Day* <input type="checkbox"/> 5 Day* <input type="checkbox"/> Other ()							
Purchase Order				1 DAY CAT								Sample Comments / DG Hazard Warning							
Quote ID No																			
No	Client Sample ID	Date	Matrix	TPH	BTEX	8 METALS	PH, EL, TDS, TS, TOC, SS, TIT	BTEX C6-C9	LEAD	1 L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL Vial	125mL Amber Glass	Jar	Other ()	Sample Comments / DG Hazard Warning	
1	TOE-120819	12/8/19	SOIL						X									Send to ACS for Analysis	
2	DO2-120819	↓	↓						X										
3	TO2-120819	↓	↓						X									Send to ACS for Analysis	
4	DO1-130819	13/8/19	WATER	X															
5	SPIKE		WATER						X										
6	BANK		WATER						X										
7																			
8																			
9																			
10																			
Total Counts																			
Method of Shipment		<input type="checkbox"/> Courier (#)		<input type="checkbox"/> Hand Delivered		<input type="checkbox"/> Postal		Name		Signature		Date		Time		Time		Temperature	
Laboratory Use Only		Received By		Grace Turnbull		SYD BNE MEL PER ADL NEW DAR		Signature		Date		13/8/19		Time		12:13		6.87	
		Received By				SYD BNE MEL PER ADL NEW DAR		Signature		Date		---		Time		---		Report No	
																		670968	

P2/2

Enviro Sample NSW

Subject: FW: Eurofins Sample Receipt Advice - Report 670968 : Site 318000780

From: Stephen Maxwell [<mailto:SMAXWELL@ramboll.com>]

Sent: Wednesday, 14 August 2019 9:43 AM

To: Enviro Sample NSW

Subject: RE: Eurofins Sample Receipt Advice - Report 670968 : Site 318000780

Thanks

If feasible to achieve and still report can we add the following analytes to the water samples:

Dissolved Metals

Aluminium

Beryllium

Barium

Cobalt

Iron

Manganese

Nutrients

Ammonia as N

Nitrate an N

Nitrite as N

Total Nitrogen

Total Phosphorus

Kind regards

Stephen Maxwell

Lead Consultant

D +61 478658194

M +61 478658194

smaxwell@ramboll.com

Ramboll Australia Pty Ltd.

ACN 095 437 442

ABN 49 095 437 442

From: EnviroSampleNSW@eurofins.com <EnviroSampleNSW@eurofins.com>

Sent: 13 August, 2019 12:54 PM

To: Stephen Maxwell <SMAXWELL@ramboll.com>

Subject: Eurofins Sample Receipt Advice - Report 670968 : Site 318000780

Dear Valued Client,

T01_120819 and T02_120819 (1 jar each) sent to ALS.

Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins | mgt Analytical Services Manager as soon as possible to make certain that they get changed.

Regards

Grace Tuckwell

Sample Receipt

Eurofins | Environment Testing

Unit F3, Parkview Building

16 Mars Road

LANE COVE WEST NSW 2066

AUSTRALIA

Phone: +61 29900 8421

Email: EnviroSampleNSW@eurofins.com

Website: environment.eurofins.com.au

[EnviroNote 1079 - PFAS Fingerprinting](#)

[EnviroNote 1080 - Total Organofluorine Analysis & PFAS Investigations](#)

Click [here](#) to report this email as spam.

ScannedByWebsenseForEurofins

Melbourne

6 Monterey Road
Dandenong South Vic 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney

Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane

1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth

2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

Sample Receipt Advice

Company name: **Ramboll Australia Pty Ltd**

Contact name: Stephen Maxwell

Project ID: 318000780

COC number: Not provided

Turn around time: 1 Day

Date/Time received: Aug 14, 2019 9:43 AM

Eurofins reference: **670968**

Sample information

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- All samples have been received as described on the above COC.
- COC has been completed correctly.
- Attempt to chill was evident.
- Appropriately preserved sample containers have been used.
- All samples were received in good condition.
- Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

- Appropriate sample containers have been used.
- Sample containers for volatile analysis received with zero headspace.
- Split sample sent to requested external lab.
- Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

T01_120819 and T02_120819 (1 jar each) sent to ALS.

Contact notes

If you have any questions with respect to these samples please contact:

Alena Bounkeua on Phone : or by e.mail: AlenaBounkeua@eurofins.com

Results will be delivered electronically via e.mail to Stephen Maxwell - smaxwell@ramboll.com.

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Aug 14, 2019 9:43 AM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	670968	Due:	Aug 15, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Aluminium (filtered)	Barium (filtered)	Beryllium (filtered)	Cobalt (filtered)	Conductivity (at 25°C)	Iron (filtered)	Lead	Manganese (filtered)	pH (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Suspended Solids Dried at 103–105°C	Turbidity	Moisture Set	Eurofins mg/L Suite B6 (filtered metals)	BTEXN and Volatile TRH	Eurofins mg/L Suite B19D: Total N, TKN, NOx, NO2, NO3, Total P		
Melbourne Laboratory - NATA Site # 1254 & 14271																					X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794																							
Perth Laboratory - NATA Site # 23736																							
External Laboratory																							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID																		
1	S03 UP	Aug 13, 2019		Water	S19-Au17273	X	X	X	X	X	X		X	X	X	X	X		X		X		
2	SS23	Aug 12, 2019		Soil	S19-Au17274							X						X					
3	SS24	Aug 12, 2019		Soil	S19-Au17275							X						X					
4	SS25	Aug 12, 2019		Soil	S19-Au17276							X						X					
5	SS26	Aug 12, 2019		Soil	S19-Au17277							X						X					
6	SS27	Aug 12, 2019		Soil	S19-Au17278							X						X					
7	SS28	Aug 12, 2019		Soil	S19-Au17279							X						X					
8	SS29	Aug 12, 2019		Soil	S19-Au17280							X						X					
9	SS30	Aug 12, 2019		Soil	S19-Au17281							X						X					

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Aug 14, 2019 9:43 AM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	670968	Due:	Aug 15, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Aluminium (filtered)	Barium (filtered)	Beryllium (filtered)	Cobalt (filtered)	Conductivity (at 25°C)	Iron (filtered)	Lead	Manganese (filtered)	pH (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Suspended Solids Dried at 103–105°C	Turbidity	Moisture Set	Eurofins mg/L Suite B6 (filtered metals)	BTEXN and Volatile TRH	Eurofins mg/L Suite B19D: Total N, TKN, NOx, NO2, NO3, Total P	
Melbourne Laboratory - NATA Site # 1254 & 14271																					X	
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																						
Perth Laboratory - NATA Site # 23736																						
10	D01_120819	Aug 12, 2019		Soil	S19-Au17282							X						X				
11	D02_120819	Aug 12, 2019		Soil	S19-Au17283							X						X				
12	D01_130819	Aug 12, 2019		Water	S19-Au17284	X	X	X	X	X	X		X	X	X	X			X		X	
13	SPIKE	Aug 12, 2019		Water	S19-Au17285															X		
14	BLANK	Aug 12, 2019		Water	S19-Au17286															X		
Test Counts						2	2	2	2	2	2	10	2	2	2	2	2	10	2	2	2	

Ramboll Environ Australia Pty Ltd
 Level 3/100 Pacific Highway
 North Sydney
 NSW 2060



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Stephen Maxwell**

Report **670968-S**
 Project name
 Project ID **318000780**
 Received Date **Aug 13, 2019**

Client Sample ID			SS23	SS24	SS25	SS26
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au17274	S19-Au17275	S19-Au17276	S19-Au17277
Date Sampled			Aug 12, 2019	Aug 12, 2019	Aug 12, 2019	Aug 12, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	350	3000	11000	33
% Moisture	1	%	1.7	3.3	4.9	2.7

Client Sample ID			SS27	SS28	SS29	SS30
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au17278	S19-Au17279	S19-Au17280	S19-Au17281
Date Sampled			Aug 12, 2019	Aug 12, 2019	Aug 12, 2019	Aug 12, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	6700	12000	3700	470
% Moisture	1	%	6.7	5.7	3.9	3.5

Client Sample ID			D01_120819	D02_120819
Sample Matrix			Soil	Soil
Eurofins Sample No.			S19-Au17282	S19-Au17283
Date Sampled			Aug 12, 2019	Aug 12, 2019
Test/Reference	LOR	Unit		
Heavy Metals				
Lead	5	mg/kg	13000	570
% Moisture	1	%	6.1	4.4

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description

Heavy Metals

- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS

% Moisture

- Method: LTM-GEN-7080 Moisture

Testing Site

Sydney

Sydney

Extracted

Aug 13, 2019

Aug 13, 2019

Holding Time

180 Days

14 Days

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Aug 14, 2019 9:43 AM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	670968	Due:	Aug 15, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Aluminium (filtered)	Barium (filtered)	Beryllium (filtered)	Cobalt (filtered)	Conductivity (at 25°C)	Iron (filtered)	Lead	Manganese (filtered)	pH (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Suspended Solids Dried at 103--105°C	Turbidity	Moisture Set	Eurofins mg/L Suite B6 (filtered metals)	BTEXN and Volatile TRH	Eurofins mg/L Suite B19D: Total N, TKN, NOx, NO2, NO3, Total P		
Melbourne Laboratory - NATA Site # 1254 & 14271																					X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794																							
Perth Laboratory - NATA Site # 23736																							
External Laboratory																							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID																		
1	S03 UP	Aug 13, 2019		Water	S19-Au17273	X	X	X	X	X	X		X	X	X	X	X		X		X		
2	SS23	Aug 12, 2019		Soil	S19-Au17274							X						X					
3	SS24	Aug 12, 2019		Soil	S19-Au17275							X						X					
4	SS25	Aug 12, 2019		Soil	S19-Au17276							X						X					
5	SS26	Aug 12, 2019		Soil	S19-Au17277							X						X					
6	SS27	Aug 12, 2019		Soil	S19-Au17278							X						X					
7	SS28	Aug 12, 2019		Soil	S19-Au17279							X						X					
8	SS29	Aug 12, 2019		Soil	S19-Au17280							X						X					
9	SS30	Aug 12, 2019		Soil	S19-Au17281							X						X					

Company Name:	Ramboll Australia Pty Ltd	Order No.:		Received:	Aug 14, 2019 9:43 AM
Address:	Level 3/100 Pacific Highway North Sydney NSW 2060	Report #:	670968	Due:	Aug 15, 2019
Project Name:		Phone:	02 9954 8118	Priority:	1 Day
Project ID:	318000780	Fax:	02 9954 8150	Contact Name:	Stephen Maxwell
Eurofins Analytical Services Manager : Alena Bounkeua					

Sample Detail						Aluminium (filtered)	Barium (filtered)	Beryllium (filtered)	Cobalt (filtered)	Conductivity (at 25°C)	Iron (filtered)	Lead	Manganese (filtered)	pH (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Suspended Solids Dried at 103–105°C	Turbidity	Moisture Set	Eurofins mg/L Suite B6 (filtered metals)	BTEXN and Volatile TRH	Eurofins mg/L Suite B19D: Total N, TKN, NOx, NO2, NO3, Total P	
Melbourne Laboratory - NATA Site # 1254 & 14271																					X	
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																						
Perth Laboratory - NATA Site # 23736																						
10	D01_120819	Aug 12, 2019		Soil	S19-Au17282							X						X				
11	D02_120819	Aug 12, 2019		Soil	S19-Au17283							X						X				
12	D01_130819	Aug 12, 2019		Water	S19-Au17284	X	X	X	X	X	X		X	X	X	X			X		X	
13	SPIKE	Aug 12, 2019		Water	S19-Au17285															X		
14	BLANK	Aug 12, 2019		Water	S19-Au17286															X		
Test Counts						2	2	2	2	2	2	10	2	2	2	2	2	10	2	2	2	

Internal Quality Control Review and Glossary
General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test				Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code			
Method Blank												
Heavy Metals												
Lead				mg/kg	< 5		5	Pass				
LCS - % Recovery												
Heavy Metals												
Lead				%	104		70-130	Pass				
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code			
Spike - % Recovery												
Heavy Metals												
Lead				S19-Au11644	NCP	%	102	70-130	Pass			
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code			
Duplicate												
Heavy Metals												
Lead				S19-Au17274	CP	mg/kg	350	380	6.0	30%	Pass	
Duplicate												
					Result 1	Result 2	RPD					
% Moisture				S19-Au17274	CP	%	1.7	1.2	35	30%	Fail	Q15

Comments
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q15	The RPD reported passes Eurofins mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Alena Bounkeua	Analytical Services Manager
Gabriele Cordero	Senior Analyst-Metal (NSW)


**Glenn Jackson
General Manager**

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.