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Our Ref 73488

13 August 2020

Adam Reed
Environment Manager
One Rail Australia
Level 3
33 Richmond Road
Keswick South Australia 5035

Dear Adam,

BERRIMAH RAIL TERMINAL – MONITORING WELL LOCATIONS

Please see table below showing monitoring well locations and elevations at both the top of PVC casing and adjacent surface. The poly pipes have been marked with a black line at the exact spot where the elevation refers to.

DRAFT

Well ID	Easting	Northing	Well Elev	Surface Elev
MW01	708423.825	8620973.001	5.958	5.227
MW01A	708416.945	8620986.556	5.921	6.005
MW02	708491.822	8620929.677	5.026	5.093
MW03	708498.128	8621016.708	5.891	5.989
MW03A	708497.314	8621016.232	5.869	5.999
MW04	708460.568	8621002.703	5.867	5.99
MW04A	708461.577	8621003.05	5.931	5.995

Origin for both Horizontal (MGA94) and Vertical Datum (AHD) was CRM S97185066, on the corner of O-Sullivan CCT and Export Dr.

Kind Regards

Thomas St John
Surveyor

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Our Ref 73488-1

22 October 2020

Adam Reed
Environment Manager
One Rail Australia
Level 3
33 Richmond Road
Keswick South Australia 5035

Dear Adam,

BERRIMAH RAIL TERMINAL – MONITORING WELL LOCATIONS

Please see table below showing additional monitoring well locations and elevations at both the top of PVC casing and adjacent surface. The poly pipes have been marked with a black line at the exact spot where the elevation refers to.

Well ID	Easting	Northing	Well Elev	Surface Elev
MW05	708398.119	8620980.232	5.906	5.983
MW06	708521.037	8621025.589	5.970	5.994
MW07	708470.486	8621039.916	5.262	5.320
MW08	708374.723	8621004.469	5.249	5.309

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Origin for both Horizontal (MGA94) and Vertical Datum (AHD) was CRM S97185066, on the corner of O-Sullivan CCT and Export Dr.

Kind Regards

Thomas St John
Surveyor

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Groundwater Monitoring and Management Plan

One Rail Australia

Appendix B: Groundwater Sampling Methodology

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1.0 GROUNDWATER SAMPLING METHODOLOGY

Sampling Procedure

Groundwater samples shall be collected as follows:

- Prior to collecting groundwater samples, standing water levels must be measured from the top of the casing. Measurements must also be taken to check for any separate phase (free) product present in each of the wells.
- Groundwater sampling to be conducted using low-flow sampling techniques. The flow rate must be monitored and regulated using an interface probe to maintain a stable water level during the purging and sampling of the groundwater. If the water level is shown to draw down at a low flow rate (i.e. cannot be maintained), alternative sampling methods should be adopted (i.e. bailer or Wattera).
- Water quality parameters (pH, temperature, electrical conductivity, oxidation reduction potential and dissolved oxygen) should be monitored during purging using a water quality meter. Sampling can occur when the drawdown and these parameters have shown to stabilise in accordance with that described in the NT Department of Mines and Energy M*ethodology for the Sampling of Ground Waters* (2009).
- The sampler must wear a clean pair of latex disposable gloves between collecting each sample.
- All groundwater samples collected to be placed in containers provided by the analytical laboratory.

Quality Control and Quality Assurance (QA/QC)

QA/QC sampling and analysis must comprise the following:

- Intra-laboratory and Inter-laboratory duplicate groundwater samples to be collected at a frequency of 1 sample per 10 primary samples. Duplicated samples should be tested for the same suite of analytes as primary samples.
- Rinsate samples should be collected at a rate of 1 per day for non-dedicated sampling equipment such as micro-purge pumps etc. to assess the quality of the equipment decontamination. These should be analysed for chemicals of concern (specifically volatile organic compounds and TPH).
- Trip blank samples should be collected at a rate of 1 per sampling day. These should be analysed for chemicals of concern (specifically volatile organic compounds and TPH).

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2.0 GENERAL QUALITY ASSURANCE / QUALITY CONTROL

The Quality Assurance / Quality Control (QA / QC) measures (as discussed in the previous sections) to be adopted include:

- accuracy (as measured by laboratory spike and surrogate recovery samples) within 75 - 125 % recovery;
- precision (as measured by field and laboratory duplicate sample analyses) within +/- 30% relative percent difference (RPD);
- trip, rinsate and field blanks should be reported below the laboratory detection limits; and
- minimum 95% completeness (as measured by the total number of analyses within acceptance limits).

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11/14 Winnellie Road
Winnellie NT 0820
Australia

DETAILED SITE INVESTIGATION REPORT

April 2021
J168829

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ONE RAIL AUSTRALIA

Berrimah Freight Terminal, Export Drive, Berrimah NT

C105292 : **VB**

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1	Electronic	Adam Reed – Environment Manager, One Rail Australia

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Diesel Spill – Detailed Site Investigation

One Rail Australia

Berrimah Freight Terminal, Export Drive, Berrimah NT

EXECUTIVE SUMMARY

A diesel spill occurred at the One Rail Australia (ORA) Berrimah Freight Terminal, Berrimah NT on 30 May 2020. ORA implemented immediate emergency response activities including the creation of a temporary drain and sump to intercept and collect diesel allowing it to be pumped out and removed. Diesel-impacted soils were excavated immediately following the spill and continued in conjunction with site investigation works.

The site was inspected by the NT Environment Protection Authority and two Authorised Officer Directions (AOD) were issued, the second of which (issued on 4 June 2020) directed ORA to (amongst other directives) determine the types, amount, distribution and mobility of contaminants in the environment as a result of the diesel spill. In order to assist with responding to the NT EPA AOD, Greencap was commissioned by ORA to undertake a Detailed Site Investigation (DSI) in conjunction with remediation excavation works.

The objectives of the DSI were to characterise the type of contamination present as a result of the spill, estimate the quantities of the diesel spilled and recovered, delineate the vertical and lateral extent of the soil and groundwater impacts associated with the diesel spill, assess the mobility of hydrocarbons still present in the spill site and assess risks to human health and environment associated with any residual soil and groundwater impacts.

Significant diesel impacts occurred in soils along the drainage line between and underlying the Auxiliary Road and Ramp Road rail lines. The spill migrated from the original location on the 1 Road Rail line to the south and then west where it collected in the Vee drain towards the road culvert approximately 100 m to the west. A temporary sump was excavated to halt flow prior to discharging into the stormwater drain beyond the road culvert and to enable the recovery of spilled diesel. Subsurface impacts, typically with the surface 0.5 m were observed throughout these areas.

Diesel impacted soils were excavated to the extents practicable, with the majority of validation results indicating successful removal of impacted materials. Final and validation analytical results confirmed residual hydrocarbon impacts in sub-ballast soils remain present beneath the 1 Road, Auxiliary Road and Ramp Road rail lines and within deeper soils at the groundwater interface.

A mass balance calculation estimated approximately 18,000 L of diesel had been recovered either directly as free phase product or through impacted soils. Based on the calculation, approximately 2,000 L of diesel remains in situ within the spill site.

The presence of hydrocarbon impacts in groundwater was reported in two of eleven groundwater monitoring wells installed. The hydrocarbon impacts were mostly represented by heavier fractions which are typical of diesel fuel. The groundwater sampling results and the presence of LNAPL in MW01 indicates that the diesel fuel from the spill has generally moved subsurface in a north-westerly direction towards the intertidal mangrove community.

Human and ecological receptors that could potentially be exposed to contamination at the diesel spill site may include:

- *Onsite workers.*
- *Site visitors and contractors who may be spending some amount of time onsite.*

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- *Potential groundwater users.*
- *Potential environmental receptor of the intertidal mangrove community and the Darwin Harbour.*

The assessment to date indicates that the site in its current condition does not pose an unacceptable risk to the identified human health and environmental receptors. However, the risk to the receptors may change if:

- *Site development occurs involving excavation of contaminated soils; or*
- *Groundwater is extracted for any human consumption; or*
- *Contaminated groundwater reaches the intertidal area.*

The following works are recommended:

- *Implement the Remediation Action Plan presented in this DSI;*
- *Develop and implement a Groundwater Monitoring and Management Plan (GMMP) to include monitoring of groundwater, surface water and sediment;*
- *Review success of RAP during remedial works (including management of impacted stockpile) and implementation of GMMP;*
- *Develop an Environmental Management Plan / Site Management Plan; and*
- *Consider undertaking predictive modelling to predict future plume migration and chemical concentrations at potential sensitive receptors.*

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Diesel Spill – Detailed Site Investigation

One Rail Australia

Berrimah Freight Terminal, Export Drive, Berrimah NT

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Appendix E GROUNDWATER WELL CONSTRUCTION LOGS

Appendix F GROUNDWATER SAMPLING RECORDS AND CALIBRATION CERTIFICATES

Appendix G LABORATORY CERTIFICATES – GROUNDWATER

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1 INTRODUCTION

Greencap Pty Ltd (Greencap) was commissioned by One Rail Australia (ORA) to conduct a Detailed Site Investigation (DSI) and remediation and validation works following a diesel spill on the 1 Road rail line located at the Berrimah Freight Terminal, Export Drive, Berrimah Northern Territory (NT) (the Site). The Site is currently operated as a commercial freight rail terminal and its location is presented in Figure 1 and Figure 2.

1.1 Background

A diesel spill estimated at approximately 20,000 litres (L) occurred on the site during automatic refueling of a diesel locomotive on 30 May 2020. Upon discovery, temporary controls were immediately implemented by ORA, including:

- Excavation of a temporary sump downslope of the spill;
- Recovery of surface diesel with the use of a vacuum truck; and
- Placement of absorbent materials in the downstream drain to the south-west of the spill to contain any surface flow.

ORA notified the Northern Territory Environment Protection Authority (NT EPA) shortly thereafter who attended the Site on Saturday 30 May 2020 to inspect the spill. As a result, the NT EPA issued an Authorised Officer Direction (AOD) on 1 June 2020, directing ORA to:

> *"Immediately prevent pollution and environmental harm resulting from the spill. By the method of preventing all spilled liquids (including diesel/hydrocarbons) from contaminating soils, surface waters or ground waters."*

Subsequent to receiving this AOD, One Rail undertook further spill clean-up works concurrently with investigation works documented in this DSI, including the following:

- Removal of soils impacted by diesel from stormwater spoon drain to the south west of the spill site;
- Removal of soils impacted by diesel within and surrounding the vicinity of the rail line infrastructure; and
- Relocation of impacted spoil to a temporary lined (heavy duty plastic sheeting) bunded area on an elevated pad.

The NT EPA issued a second AOD on 4 June 2020, directing ORA to:

1) *To immediately manage waste on or in land by:*

   a. *Undertaking sufficient surface water, groundwater and soil analysis to be able to determine the types, amount, distribution and mobility of contaminants in the environment as a result of the diesel spill that occurred at the premises on 30 May 2020; and*

   b. *By 5 June 2020, determine and implement suitable actions to manage and start to recover waste in the land that have resulted from the diesel spill that occurred at the premises on 30 May 2020; and*

   c. *Undertake daily inspections and sufficient monitoring to detect any pollution or impact to the surrounding environment as a result of the diesel spill, including but not limited to the identified Significant Biodiversity Area located adjacent to the spill location.*

ORA engaged Greencap to assist with the diesel spill investigations and assessments to minimise risks to the human health and environment. The results of the site investigation and assessment undertaken by Greencap to date are presented in this DSI report together with a summary of remediation work conducted to date and future remediation works to be undertaken.

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Project:	Detailed Site Investigation					FIGURE 1	Site Location Plan	GREENCAP Going Further in Managing Risk
Location:	Export Drive, Berrimah NT							Unit 11/14 Winnellie Rd Winnellie NT 0820 Telephone (08) 8879 1300
Job Ref: J168829	Drawn: VB	Checked: DB	Date: 25/03/21	Scale: Not To Scale	Source: Google Earth			



Project:	Detailed Site Investigation					FIGURE 2	Site and Spill Location Plan	GREENCAP Going Further in Managing Risk
Location:	Export Drive, Berrimah NT							Unit 11/14 Winnellie Rd Winnellie NT 0820 Telephone (08) 8879 1300
Job Ref: J168829	Drawn: VB	Checked: DB	Date: 25/03/21	Scale: Not To Scale	Source: NR Maps			

1.2 Objectives

The NT EPA AOD (4 June 2020) directed ORA *"to determine the types, amount, distribution and mobility of contaminants in the environment as a result of the diesel spill that occurred at the premises on 30 May 2020"*. Therefore the objectives of this DSI were to:

- Characterise the type of contamination sustained as a result of the spill.
- Estimate the quantities of diesel spilled and recovered.
- Delineate the vertical and lateral extent of the soil and groundwater impacts associated with the diesel spill.
- Assess the mobility of hydrocarbons still present in the spill site (if any).
- Assess risks to human health and environment associated with the residual soil and groundwater impacts.
- Prepare DSI report to summarise the investigation results and provide further guidance on next stages of remediation and future site management.

The requirements for Detailed Site Investigations and reporting are outlined in the national guiding document: National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPM) as updated in 2013. The DSI report structure generally follows the NEPM requirements.

1.3 Remediation Action Plan (RAP)

The diesel spill remediation works were conducted in accordance with a Remediation Action Plan framework prepared by Greencap and submitted under separate cover.

Remediation criteria for the site was based on the current land use, that being Commercial / Industrial (*ASC NEPM*, 2013).

Remedial works completed to date include:

- Excavation of a temporary, approximately 0.3m deep sump downslope of the spill to collect surface diesel to be pumped out for disposal.
- Placement of absorbent materials between the spill and downstream drain to the south-west of the spill.
- Removal of soils impacted by diesel from the stormwater swale drain to the south-west of the spill site.
- Removal of soils impacted by diesel as far as was reasonably practicable within and surrounding the vicinity of the rail line infrastructure.
- Impacted soil that has been excavated is being temporarily stored on and under heavy duty plastic sheeting on an elevated pad.

The above and additional actions as appropriate will be included in the RAP section of this report (refer Section 11).

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2 SCOPE OF WORK

The scope of environmental work conducted has comprised:

- A desktop study of the local and regional environmental characteristics including local geology and hydrogeology;
- Excavation of 31 test pits, drilling with a solid auger at 17 locations, non-destructive test pitting at six locations, collection of approximately 170 validation samples, collection and analysis of soil samples to:
    - Characterise the extent of the contamination;
    - Assess the level of contamination to enable Tier 1 risk assessment; and
    - Removal and validation of contaminated material.
- Installation of eleven groundwater monitoring wells at the spill site and collection groundwater samples to:
    - Assess impacts to groundwater;
    - Delineate the extent of impacts resulting from the spill (if present); and
    - Assess the potential mobility of diesel product.
- Preparation of this DSI report, which outlines the following:
    - Findings of the desktop study;
    - Findings of the soil sampling and analysis;
    - Findings of the groundwater sampling and analysis;
    - Development of a Conceptual Site Model (CSM);
    - Human health and ecological risk assessment; and
    - Recommendations.

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3 SITE IDENTIFICATION

3.1 Site Location

A site summary is provided in Table 1.

Table 1: Site Summary

Details	Description
Street Address	Export Drive, Berrimah NT
Certificate of Title	Volume 757 Folio 262; and Volume 754 Folio 416
Parcel Reference	NT Portions 5411; and 5641, Hundred of Bagot
Plan	S2000/1912B; and S2003/163
Zoning	Zoned as Railway under the NT Planning Scheme
Local Government Authority	Darwin City

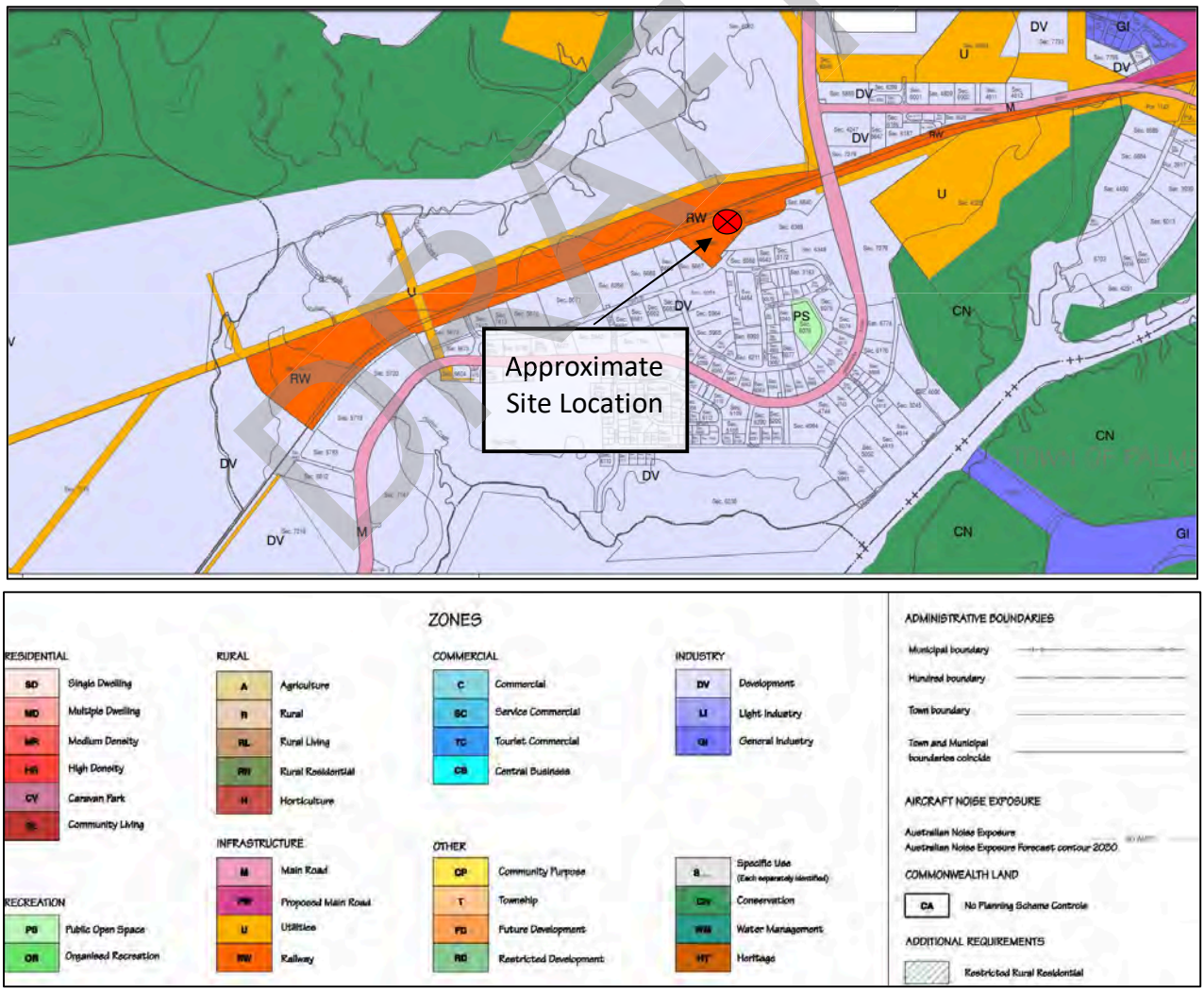


Figure 3: Zoning Plan (Source: Darwin Planning Scheme Map 2020)

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3.2 Regional and Physical Setting

The site is located in the upper reaches of East Arm in Darwin Harbour, approximately seven kilometres (km) east of the City of Darwin, NT and occupies an area of approximately 19 hectares (ha) (refer to Figure 1).

Land uses surrounding the Site include:

- Directly to the north, intertidal mangrove habitat zoned Development, further north of which is Blesser's creek (Darwin Harbour) and intertidal mangrove habitat zoned Conservation.
- Directly to the east, unoccupied, cleared land zoned Development, further east of which is Berrimah Road and a small amount of uncleared forest.
- Directly to the west, the Darwin passenger rail terminal; and
- Directly to the south are numerous industrial/commercial premises.

The nearest surface water body is the intertidal mangrove assemblage zone of Darwin Harbour's East Arm and Blesser's Creek, located directly adjacent to the northern boundary of the site.

3.3 Current Site Condition and Land Use

The site is used as a freight rail terminal and consists of four railway lines (Main Line, 1 Road, Auxiliary Road and Ramp Road) all generally running east-west, an asphalt sealed container pad used for the loading and transfer of freight to and from heavy rail, locomotive/car maintenance sheds at the east end of the Site and an office building and gatehouse to the south on Export Drive. A site plan is presented in Figure 4.

3.4 Spill Site Description

The spill occurred on the 1 Road rail line, to the north of the office building and spread under the Auxiliary Road and Ramp Road rail lines to the south, and along an unlined Vee-drain to the west where a temporary interception sump was excavated and used to recover some of the diesel. The Vee-drain continues west past the recovery/interception sump and a second vee drain exists to the south of the spill site, approximately 20 metres to the south of the Ramp Road at its closest point. Directly to the north of the spill site is the asphalt lined container pad, further afield is the edge of the intertidal mangrove community located downgradient of the spill site, approximately 40 metres away. The rail lines are covered by ballast material (very coarse gravel and cobbles) which is also present on the surface between the rail lines. South of the Ramp road is a cover of unsealed fine crushed rock/gravel material. A figure presenting the spill location is presented in Figure 5.

Plans presenting sampling and validation locations are presented in Section 6.

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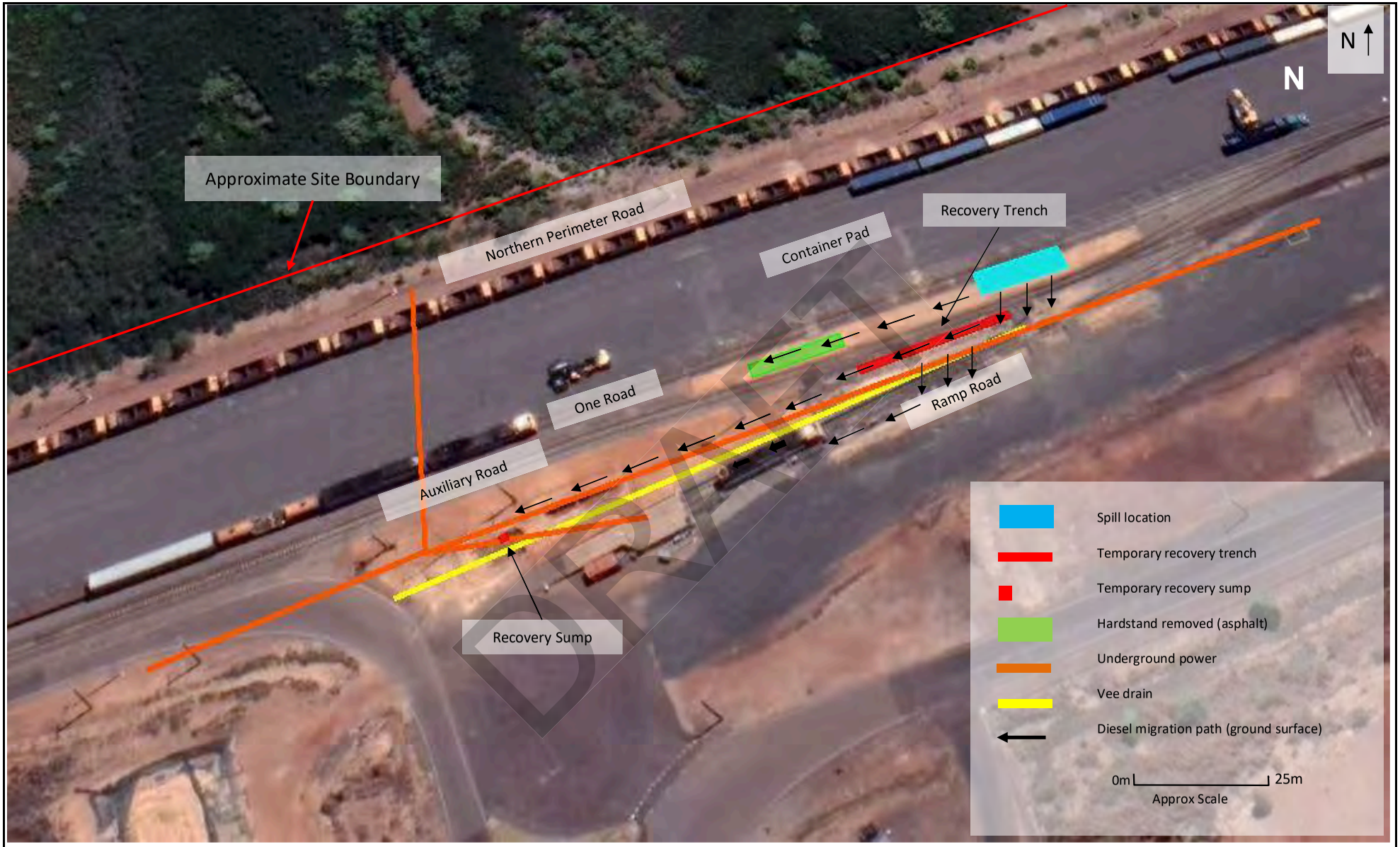
Legend

Site boundary

Date Data Colleced: 8 May 2020
Source: Background Photomap courtesy of nearmap

Client: One Rail Australia	Title: Site Location Plan	Approximate Scale 0 50 100 150m			
Client No. C105292	Address: Berrimah Freight Terminal - Export Drive, Berrimah NT				
Project: Diesel Spill Targeted Site Contamination Investigation					
Job No. J168829	Drawn: KTK / PM: SC	Date: 19/06/2020	File Name: Site Plan	Figure No. 4	

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Project:	Detailed Site Investigation					FIGURE 5	Spill Location Plan	GREENCAP Going Further in Managing Risk
Location:	Export Drive, Berrimah NT							Unit 11/14 Winnellie Rd Winnellie NT 0820 Telephone (08) 8879 1300
Job Ref: J168829	Drawn: VB	Checked: DB	Date: 25/03/21	Scale: As shown	Source: NR Maps			

4 GEOLOGY AND HYDROGEOLOGY

4.1 Geology

The 1:100,000 Geology (NT Gov. Department of Business, Industry and Resource Development, 2001) identifies four geological forms for the site (see Figure 6) including:

- The eastern end of the site listed as Qc (Quaternary: slope wash, sandy flood plains, gravel, sand, silt, colluvium).
- The central part of the site listed as Qca (Quaternary coastal alluvium: mud, silts and clays).
- Small parts of the western end of the site listed as Efb (Burrell Creek formation: Siltstone, shale and phyllite, quartz veins, coarse quartz sandstone, quartz arenite, arkose, quartz pebble conglomerate) and L (Tertiary laterite gravel (pisolitic and nodular); duricrust/ferricrete).

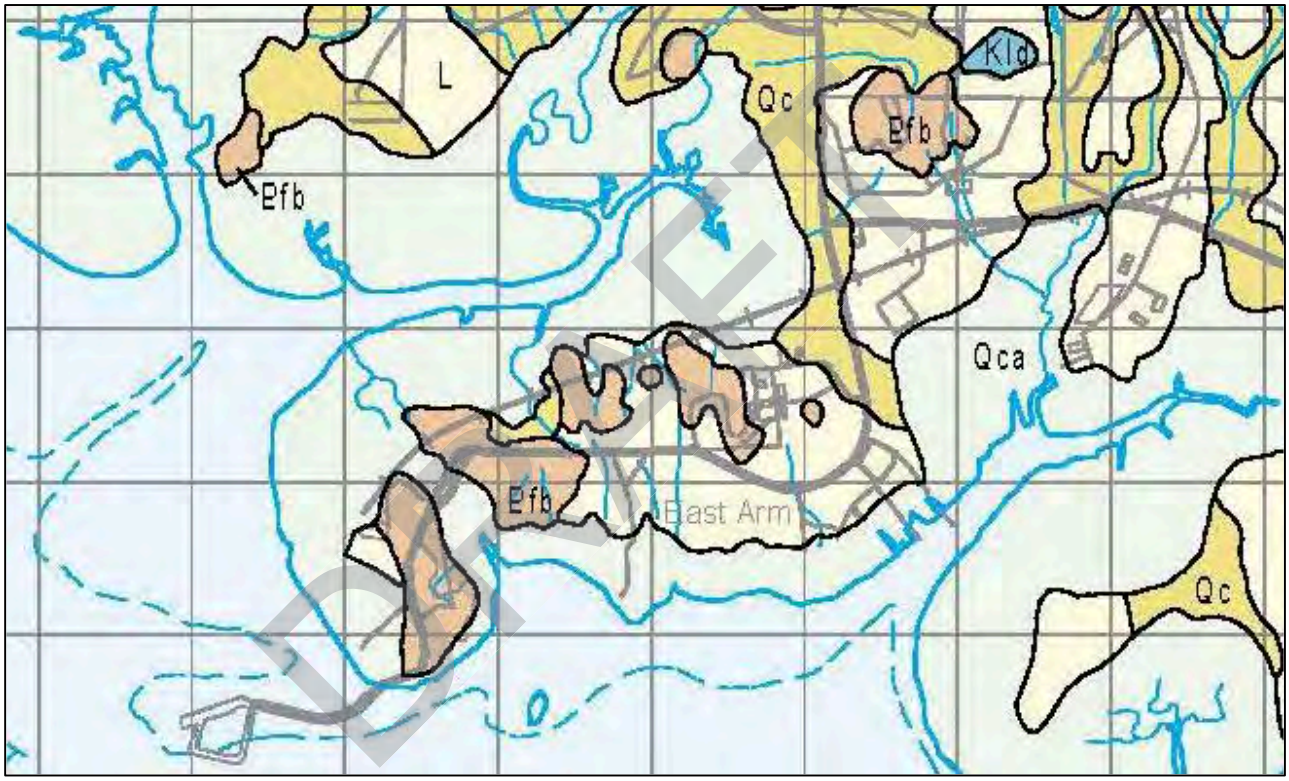


Figure 6: Site Geology (source 1:100 000 Geological Series Sheet 5073)

Natural soils encountered during this DSI were limited to the northern edge of the Site, i.e. the edge or interface with the intertidal mangrove forest.

4.2 Fill/Reclaimed Material

Fill/reclaimed material was encountered across the area of investigation generally consisted of rail ballast/gravel and surface asphalt. Underlying material encountered comprised of trench backfill and compacted fill generally characterised as sandy gravelly silt. Subsurface conditions are further discussed in in Section 6.6.1.

4.3 Acid Sulfate Soils

The Site is in an area identified as having a high probability of occurrence (with very low confidence) of acid sulphate soils (ASRIS online database, 2020) and natural materials encountered on the edge of the mangroves were noted as containing sulfurous odours.

4.4 Hydrogeology

A general review of regional hydrogeological settings, groundwater occurrence and groundwater quality for the Darwin region is presented in Verma (2002). Regional aquifers generally occur within the Cretaceous and Proterozoic sediments and rocks. Verma (2002) notes that the Burrell Creek Formation typically contains minor aquifers and the Cretaceous Bathurst Island Formation is not classified as an aquifer because bores in this area often become dry during the Dry season due to water level fluctuations. As indicated in Haig and Townsend (2003), aquifer recharge in the Darwin Harbour catchment occurs during wet seasons arising from the direct infiltration of water into the regional aquifer(s) during December through to May. Although in some years, recharge can begin as early as October and end as late as June.

Reference to published groundwater and hydrogeological maps (Northern Territory Government, Department of Planning and Infrastructure, 2004) indicates that Burrell Creek formation underlying the site is a fractured weathered rock with minor groundwater resources. It is classified as a Local Scale Aquifer.

Site specific groundwater occurrence is presented in Section 7 of this report.

4.5 Existing Groundwater Users

As shown on Figure 7 (sourced from the NT Natural Resource Maps database https://nrmaps.nt.gov.au/nrmaps.html) there are no registered groundwater wells were located in the vicinity or within the spill site. The closest historical bore is located installed approximately 1.6 km to the west of the site and the closest operation bore is located approximately 1.9km to the south of the site.



Figure 7: Registered Groundwater Bores (source NR Maps)

5 DATA QUALITY OBJECTIVES

Following the NEPM requirements the sections below present the data quality objectives (DQO) used to define the type, quantity and quality of data needed to make decisions relating to contamination of the site. The process for developing the project specific DQOs is described in the following sections.

5.1 State the Problem

A diesel spill of approximately 20,000L occurred on the site on 30 May 2020 which caused soil and potentially groundwater contamination. Thus delineation of impacts and assessment of risks to human health and environment need to be undertaken, which will drive necessary remedial works.

5.2 Identify the Decision

The findings of the assessments will be used to assess whether:

- The diesel contamination from the spill pose an unacceptable risk to human health and/or the environment;
- Stockpiled diesel impacted soil has to be disposed of off-site or can be treated and re-used on site; and
- Whether additional remediation work is required to reduce or eliminate potential risks.

5.3 Identify Inputs to the Decision

Sampling of soil and groundwater was conducted to assess the environmental condition of the site and surrounds.

The investigation program adopted a targeted approach including in-situ soil sampling and the installation of groundwater monitoring wells in order to characterise the nature of contamination and delineate the extent of the spill. Diesel-related contaminants of potential concern (total recoverable hydrocarbons (TRH and benzene, toluene, ethylbenzene, xylenes and naphthalene (BTEXN)) have been assessed. Environmental data is compared to the relevant screening criteria.

If any exceedances of groundwater and/or soil screening levels for vapour intrusion that pose a potential unacceptable risk to human health and/or the environment are identified, soil vapour sampling will be recommended to be undertaken.

5.4 Define the Study Boundaries

The investigation boundary is based on suspected extent of the diesel related soil and groundwater impacts and is illustrated in the sample location plan in Figure 8. The vertical boundary is considered to be the groundwater level of the uppermost aquifer beneath the site as spilled diesel fuel is lighter than water and cannot migrate below the groundwater level.

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5.5 Develop a Decision Rule

The decision rule developed to guide the investigations and assessments was that if field observations and/or soil and/or groundwater sampling results indicate the presence of site contamination which poses an unacceptable risk to the environment or human health then remediation and/or management of those areas may need to be established with respect to the site use. This may prompt further site-specific investigations, including the delineation of any impacts identified.

5.6 Specify Limits on Decision Errors

Data quality indicators (DQIs) of completeness, comparability, representativeness, precision and accuracy as presented in the NEPM are to be used to evaluate data acceptability.

Decision error limits employed to demonstrate that the data satisfies the DQIs and subsequent decisions of site suitability as acceptable are set at 5% i.e. tolerable limits of 95% confidence.

5.7 Optimise the Design for Obtaining Data

The soil investigation program was designed to assess the vertical and lateral extent of the diesel spill. The soil investigation involved the excavation of several test pits, drilling soil bores and non-destructive test pits respectively to delineate the extent of impact within and around the spill site.

This achieved lateral delineation to the east and south west of the spill where no diesel impacted soils were observed. The further soil investigation works undertaken allowed for lateral delineation of impacts to the north and south.

The groundwater investigation program is designed to identify and delineate groundwater impacts and assess potential risks to the environment and the human health.

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6 SOIL INVESTIGATION & REMEDIATION WORKS

6.1 Scope of Work and Rationale

The investigation was designed to target areas of suspected diesel contamination using field observations including screening soil samples with a calibrated photo-ionization detector (PID) capable of measuring volatile compounds. Soil sampling and analysis was undertaken to assess the extent of diesel impacts in the soil from the spill (as far as reasonably practicable).

Soil investigation works were undertaken over two stages: a) initial investigation and b) post-remediation investigations as follows:

- **Initial Investigations:** during the immediate spill response activities between 1 June 2020 to 19 June 2020.
- **Post-Remediation Investigations**:
    - During the installation of seven groundwater monitoring wells (MW01 to MW04 including MW01A, MW03A and MW4A) on 16 July 2020.
    - Subsequent validation sampling at the area of the spill on 24 and 26 August 2020, 22 September 2020, 1 and 12 October 2020 to further delineate the impacts. These works are detailed in Section 7.

The soil investigations were conducted under the supervision of an experienced field scientists from Greencap.

6.2 Sampling Plan

The implemented sampling plan for the purpose of delineation of the impacts is described for both stages of investigations below.

6.2.1 Initial Investigation

The initial investigations conducted immediately following the spill from 2 – 19 June 2020 targeted the spill area and immediate surrounds (refer Figure 8). Locations are summarised in Table 2. Soil samples were also collected during the drilling and installation of groundwater monitoring wells.

Table 2: Investigation Locations

Area	Date	Sample Locations	Rationale
Northern Perimeter Road	2 – 3 June 2020	TP01 – TP04	Assess impacts to nearest sensitive receptor
Edge of mangroves adjacent northern perimeter of the site	3 June 2020	TP05 – TP08	Assess impacts to nearest boundary to sensitive receptor
Container Pad	3 – 5 June 2020	BH01 – BH10	Assess impacts immediately adjacent the spill location
Southern Laydown Area	3 – 5, 10, 19 June 2020	TP09, TP12 – TP14, TP16, TP33, BH11 – BH12	Assess impacts to south of the spill location over Ramp Road
Spill location	5 June 2020	BH13 – BH15	Delineate depth of impact in spill location
Under 1 Road and Auxiliary Road rail lines, west of spill	5, 11 June 2020	BH17, TP24 – TP26, TP28	Assess impacts under rail line, downgradient from spill location

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Area	Date	Sample Locations	Rationale
Under 1 Road and Auxiliary Road rail lines, south of spill	11 June 2020	BH16, TP29	Assess impacts under rail line, downgradient from spill location
East of spill in the vicinity of 1 Road, Auxiliary Road and Ramp Road rail line junctions	5, 10 – 11, 19 June 2020	TP10, TP21 – TP23, TP27, TP27A, TP34, NDTP06	Assess impacts between 1 Road and Auxiliary Road rail lines, up gradient from spill
Under Ramp Road, south of spill	10 June 2020	TP11, TP15, NDTP05	Assess impacts south of spill site
South of the Auxiliary Road at the western end of Vee drain	10 – 11 June 2020	TP17 – TP20, TP30, NDTP01 – NDTP04	Assess impacts at end of drain and adjacent temporary sump
South west of spill site, far side of culvert under road	19 June 2020	TP31 – TP32	Assess impacts from potential discharge via drain under road

All soil investigation locations are show in Figure 8 and results are detailed in Sections 6.6.1, 6.6.3 and 6.6.4.

6.2.2 Delineation and Post-Remediation Works Investigation

Remediation excavations of diesel-impacted soils were undertaken concurrently with the initial investigation described in Section 6.2.1. Further delineation works were completed following receipt of results as presented in Table 3.

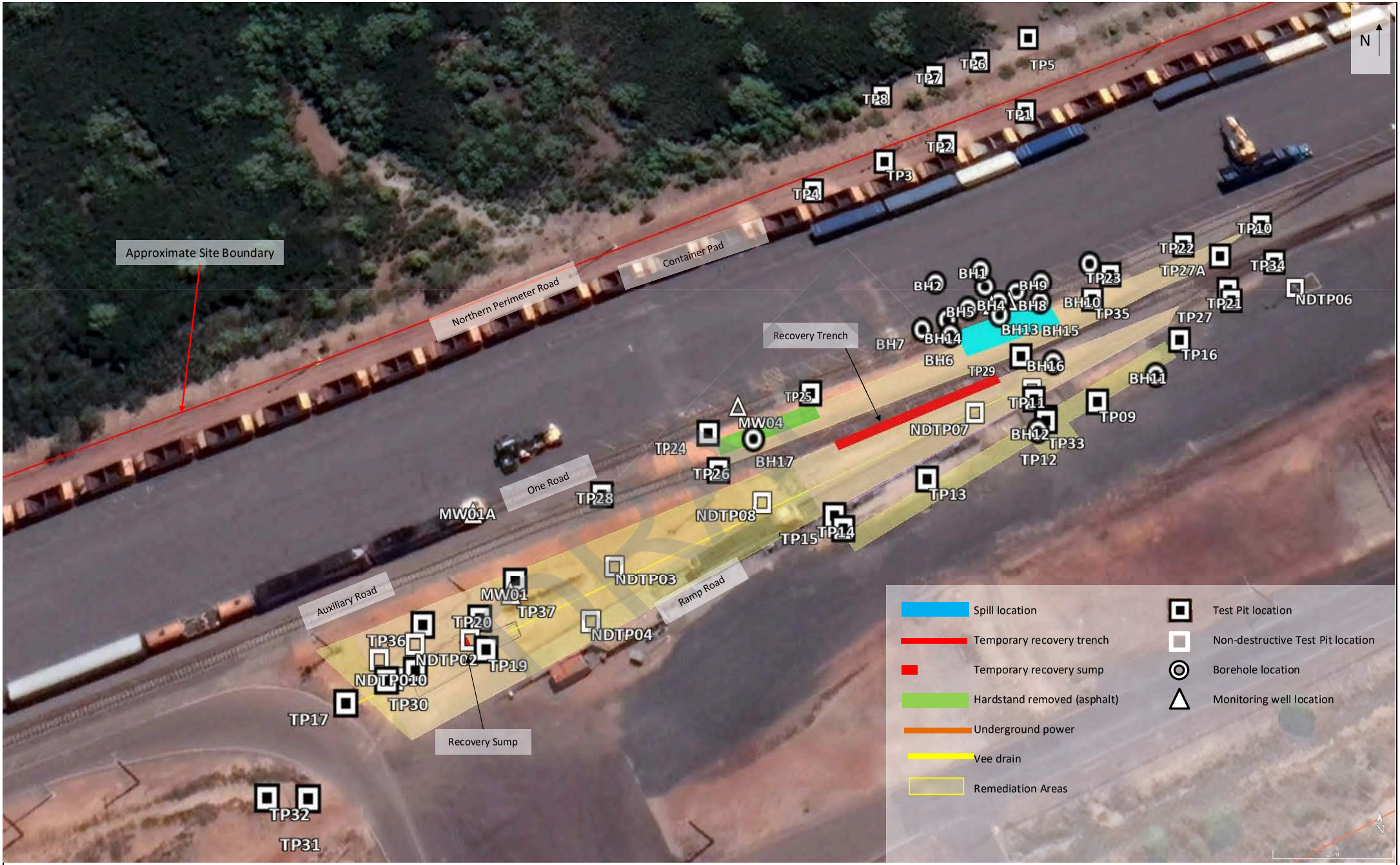
Table 3: Further Delineation Investigation Locations

Area	Date	Sample Locations	Rationale
Along length of electrical power line adjacent Vee drain	16 July 2020	NDTP06 – NDTP10	Assess impacts along trench materials in electrical power line trench
East of spill in the vicinity of 1 Road, Auxiliary Road and Ramp Road rail line junctions	24 August 2020	TP35	Upgradient delineation from spill
South of the Auxiliary Road at the western end of Vee drain	26 August 2020	TP36 – TP37	Delineation around temporary recovery sump
Excavation Areas	Various	V01 – V178	Refer Section 7

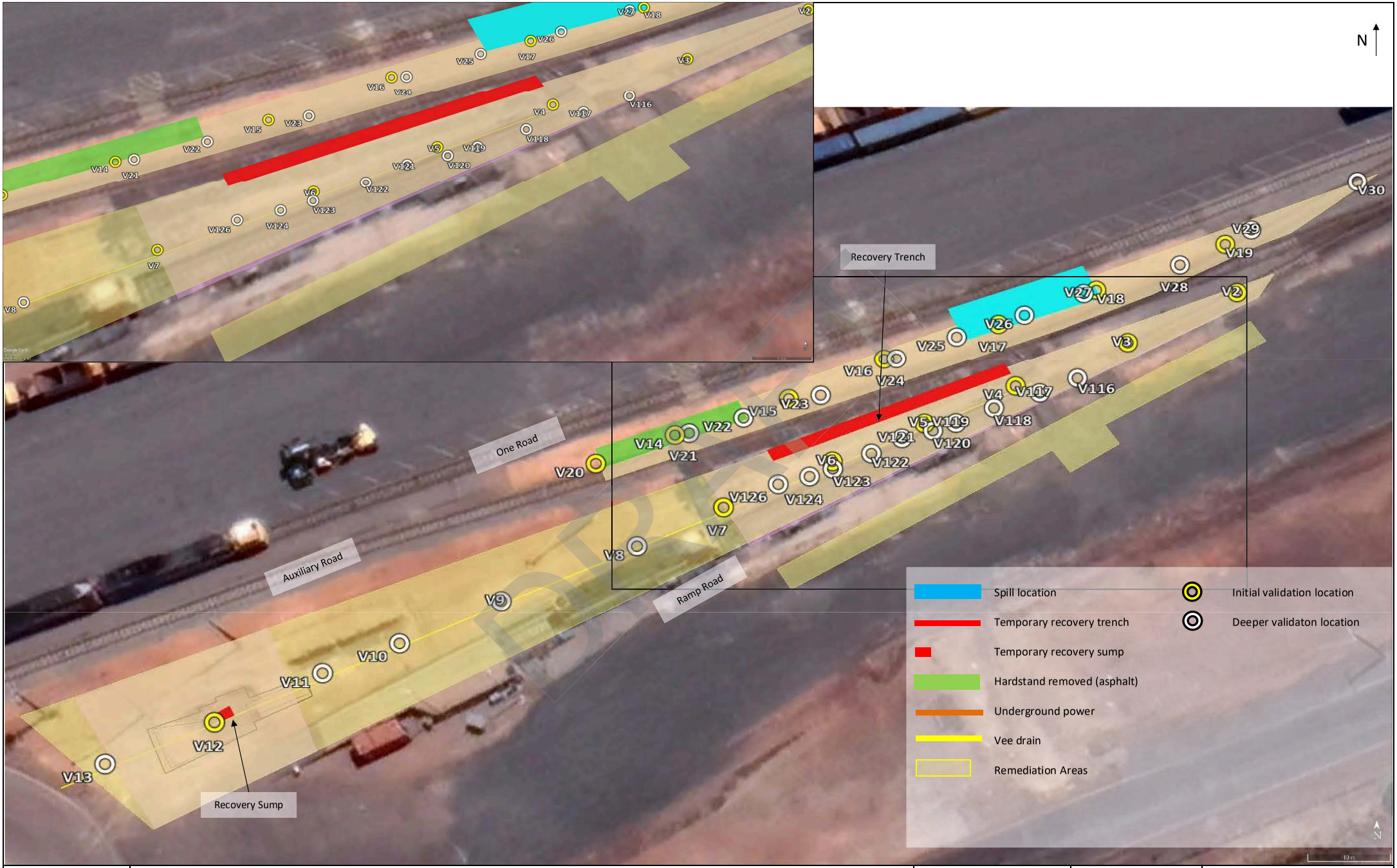
All soil validation locations are shown in Figure 9a to Figure 9c, results are detailed in Sections 6.6.1, 6.6.3 and 6.6.4.

During these works, approximately 170 validation soil samples (V02 to V178) were collected from the walls and bases of the excavations to assess for residual contamination if present. Remediation works and results are detailed in Section 7.

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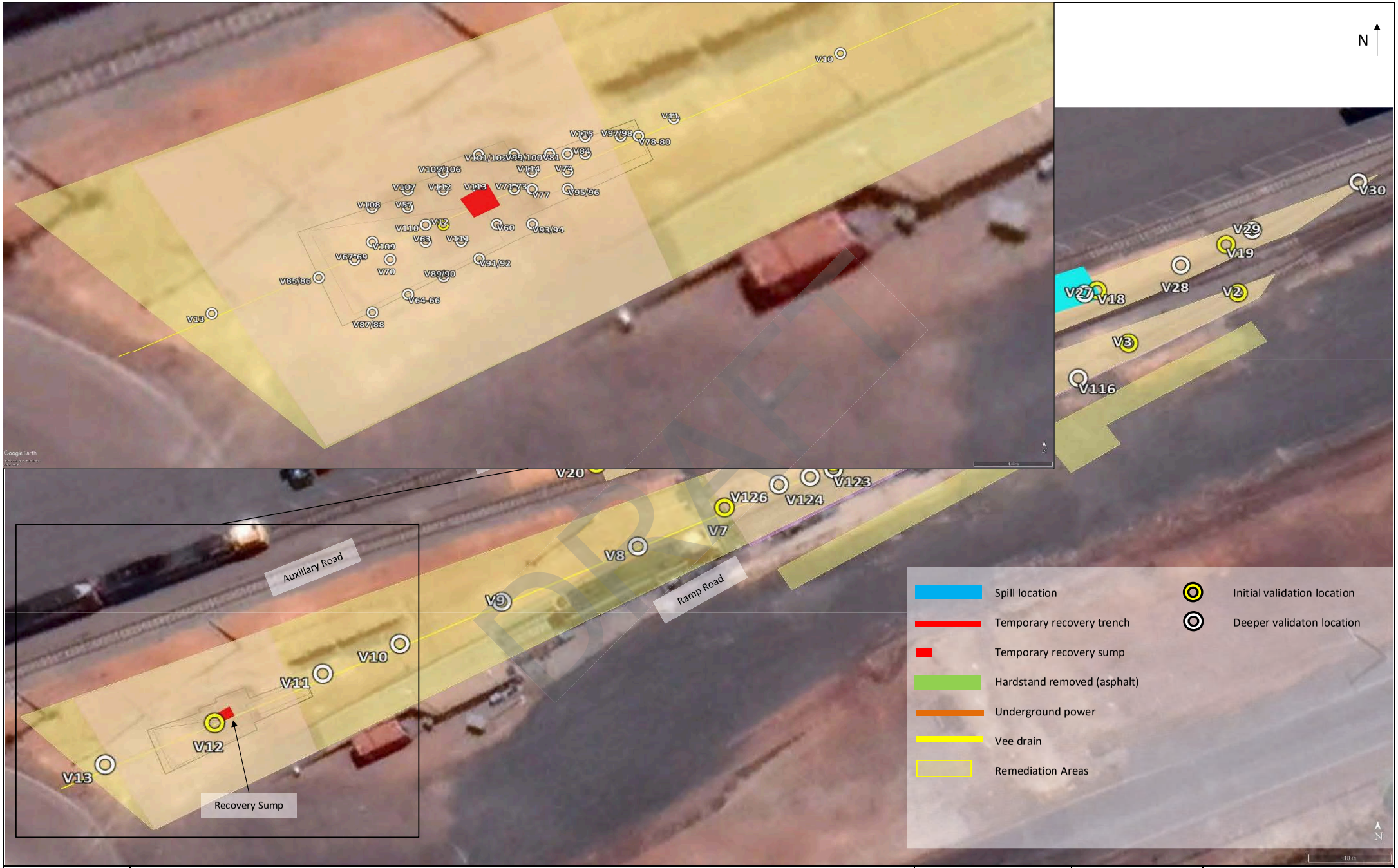


Project:	Detailed Site Investigation					FIGURE 8	Sample Location Plan	GREENCAP
Location:	Export Drive, Berrimah NT							Unit 11/14 Winnellie Rd Winnellie NT 0820 Telephone (08) 8879 1300
Job Ref: J168829	Drawn: VB	Checked: DB	Date: 25/03/21	Scale: As shown	Source: NR Maps			



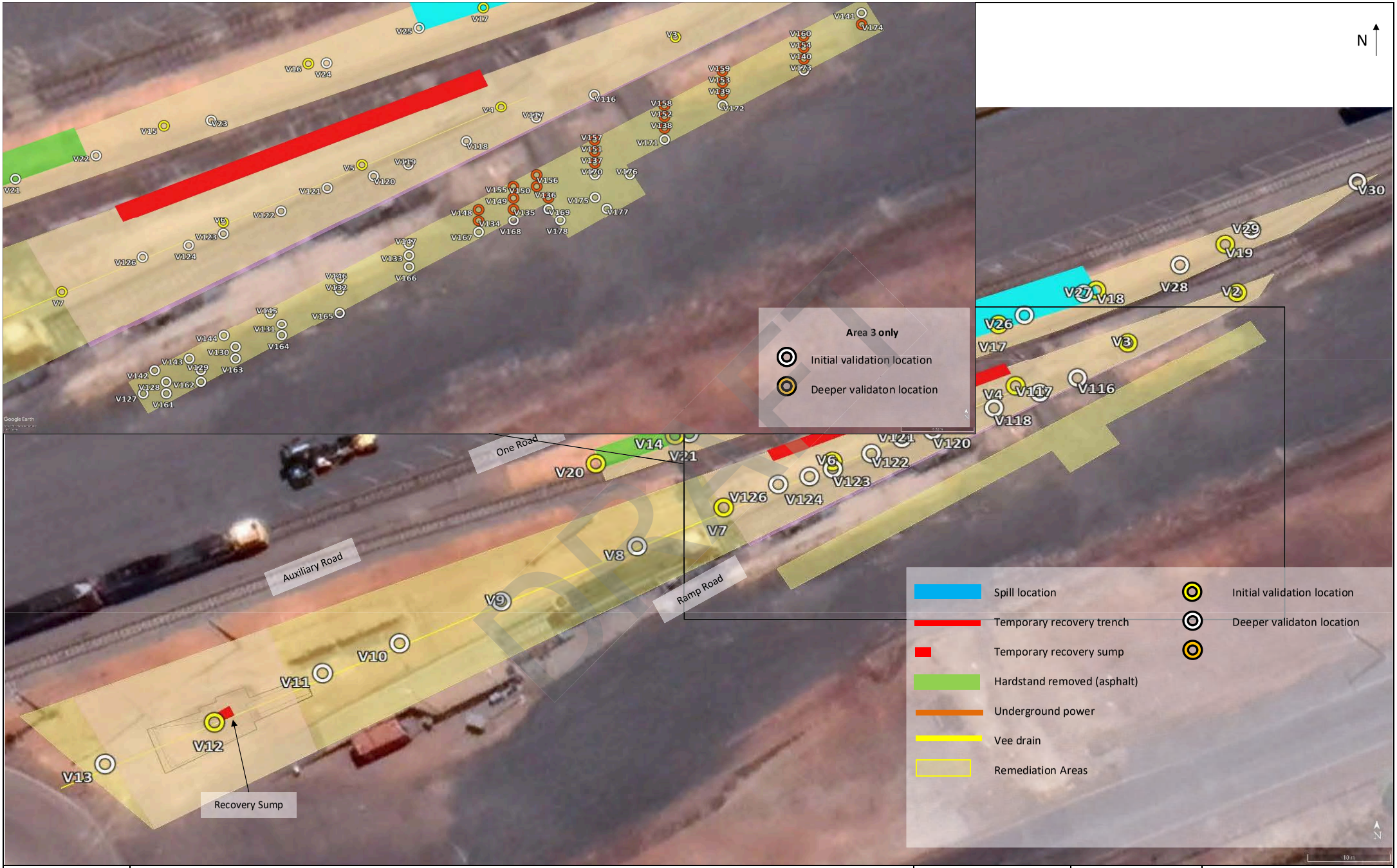
Project:	Detailed Site Investigation					FIGURE 9a	Validation Sample Location Plan (Areas 1 and 2)
Location:	Export Drive, Berrimah NT						
Job Ref: J168829	Drawn: VB	Checked: DB	Date: 25/03/21	Scale: As shown	Source: NR Maps		

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Project:	Detailed Site Investigation					FIGURE 9b	Validation Sample Location Plan (Areas 2b and 2c)
Location:	Export Drive, Berrimah NT						
Job Ref: J168829	Drawn: VB	Checked: DB	Date: 25/03/21	Scale: As shown	Source: NR Maps		

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Project:	Detailed Site Investigation					FIGURE 9c	Validation Sample Location Plan (Area 3)
Location:	Export Drive, Berrimah NT						
Job Ref: J168829	Drawn: VB	Checked: DB	Date: 25/03/21	Scale: As shown	Source: NR Maps		

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6.3 Methodology

The soil sampling methodology was as follows:

- Test pits were excavated using an excavator to a maximum depth of 4.5 metres below ground level (m bgl) at 37 locations.
- Non-destructive test pitting with the use of a high-pressure hose and vacuum truck at six locations.
- Boreholes were drilled using mechanical drilling equipment to a maximum depth of 4.5m bgl at 17 locations.
- Collection of soil validation samples in a systematic grid approach to verify the results of remedial excavation works.
- The soils were logged by an experienced environmental scientist. Borehole/test pit logs are included in Appendix A.
- Representative soil samples were collected at regular depth intervals and / or changes in lithology / observation of diesel related impacts. Soil samples were collected directly from the excavator bucket or auger. A fresh pair of disposable gloves were worn by the sampler and soil samples were placed into Teflon sealed glass jars supplied by the analytical laboratory.
- Selected soil samples were screened for volatile organic compounds (VOCs) in the field using a photoionisation detector (PID) that was calibrated prior to use. Samples were placed in sealable plastic bags, agitated, and then a headspace reading taken using the PID. The PID calibration record is presented in Appendix A.
- Collected soil samples were stored in an ice filled portable cooler and transported to the analytical laboratory with chain of custody documentation. All laboratories used were accredited by the National Association of Testing Authorities (NATA).

Ten samples were collected from the stockpiled impacted material after the initial excavation works, targeting the suspected most contaminated material. Subsequently, eleven more samples were collected once stockpiling activities were completed.

6.4 Soil Analytical Program

The soil analytical program comprised the analysis of selected eighty samples for diesel-related chemicals including total recoverable hydrocarbons (TRH) and benzene, toluene, ethylbenzene, xylenes, and naphthalene (BTEXN).

The laboratories used for the soil testing were Eurofins (primary) and Australian Laboratory Services (ALS) (secondary). The laboratories are NATA accredited and the analyses conducted are within the NATA registration of laboratories.

A summary of soil analytical results is presented as an attachment to this report. Field duplicate and blank samples were also collected during the soil investigation. A discussion of quality assurance (QA) and quality control (QC) procedures undertaken is presented in Section 9.

6.5 Soil Assessment Criteria

Chemical concentrations in soil samples have been compared with criteria specified in NEPM. The relevant investigation exposure settings are considered to be:

- NEPM 2013 Table 1B(7) Management Limits (MLs) – Commercial/Industrial land use.
- NEPM 2013 Table 1B(6) Ecological Screening Levels (ESLs)/Ecological Investigation Levels (EILs) – Commercial/Industrial land use.

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- NEPM 2013 Table 1A(3) Health Screening Levels (HSLs) (D) for Vapour Intrusion – Commercial/Industrial land use.

Screening levels are applied based on the soil type encountered and the depth of sample, where relevant. The investigation exposure settings for coarse soils (sands) were adopted based on the excavations results.

6.6 Soil Investigation Results

6.6.1 Subsurface Conditions

Given the nature of the site, subsurface conditions were variable across the investigation area. Therefore, subsurface conditions are summarized by sub-area below.

Northern Perimeter Road

The soil conditions encountered in test pits excavated within the northern perimeter road generally consisted of a thin layer of light greyish brown silty gravelly sand on top of compacted fill, generally characterised as brownish yellow sandy gravelly silt. The maximum encountered depth of compacted fill was 2.1m bgl at TP03.

Groundwater was not encountered and there were no indicators of diesel impacts observed or measured with the PID at these locations.

Fill material in the rail sub-base is heavily compacted to 100% maximum dry density. Designs of the fill material encountered showing the compaction capping layer are presented in Appendix B.

Mangrove Shoreline

The maximum depth of excavation on the edge of the mangroves was 2.0m bgl. The soil conditions encountered in test pits excavated on the edge of the mangroves outside the northern perimeter of the site generally consisted of an approximately 0.1m thick surface layer of loose light greyish brown sand, underneath of which was compacted fill (brownish yellow sandy gravelly silt). Beneath the fill material natural dark grey to greenish grey soft organic silty clays and sandy clays were encountered to a maximum depth of approximately 2.0m bgl (TP07). Some pale greyish, yellowish brown sandy clayey fine to medium grained gravels were encountered from 1.73 - 2.0m bgl (TP08).

Groundwater was encountered in all test pits on the edge of the mangroves as shallow as 0.6m bgl at TP08.

There were no indicators of diesel impacts observed or measured with the PID at these locations.

Container Pad

The soil conditions encountered in the boreholes drilled within the container pad consisted of a 0.08m thick layer of asphalt generally on top of a thin layer of brown gravelly sand and deeper compacted fill, generally characterised as brownish yellow to reddish brown sandy gravelly silt. The compacted fill was present at a depth of at least 3.9m bgl, the greatest depth of drilling on the container pad (BH08).

Groundwater was encountered in two boreholes drilled through the container pad, BH03 and BH08 at approximately 3.0-3.1m bgl.

Slight hydrocarbon odours were noted in the soil collected from BH08 (2.5, 3.5 and 3.9m bgl). There were no other indicators of diesel impacts observed or measured with the PID at any other locations within the container pad.

Within / Between Rail Infrastructure

The soil conditions encountered at test locations within and between the three rail lines consisted of a layer of rail ballast (cobble size basalt) approximately 0.3m thick, underneath of which was an approximate 0.05m thick layer of brownish grey sand and deeper compacted fill, generally characterised as brownish yellow to reddish brown sandy gravelly silt. It is noted, however, that a layer of surface asphalt encountered between the 1 Road and Auxiliary Road rail lines through which one borehole (BH17) and one test pit (TP28) were

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drilled/excavated. Beneath asphalt a mix of sandy rail ballast and gravelly sand was observed which was underlain by compacted fill. The compacted fill was present to a depth of at least 3.5m bgl, the greatest depth of investigation within the rail lines (BH14 and BH15).

Groundwater was encountered in two boreholes drilled through the rail lines, BH14 and BH15 at approximately 3.0m bgl, and in two boreholes drilled between the rail lines, BH16 and BH17 at approximately 2.6 and 3.25m bgl respectively.

Hydrocarbon odours and staining were noted in rail ballast at test locations BH13-BH15 (the location of the spill), TP11, TP23, TP25 and TP29. Hydrocarbon odours were noted in soils beneath rail ballast at test locations BH13-BH15, BH17, TP11, TP23, TP24, TP25 and TP29 and NDTP05 to a maximum depth of 2.0m bgl (at BH14). Diesel impacts as indicated by elevated PID readings in soils beneath ballast measured at test locations BH13-BH15, BH17, TP11, TP23, TP25, TP29 and NDTP05, as high as 210 ppm (TP29) and to the depth of 3.1 m bgl at BH14.

No indicators of diesel impacts were observed or measured with the PID at any other test locations within or between the rail lines.

Underground Services Alignment

The soil conditions encountered at test locations south of the Auxiliary Road on top of, and immediately surrounding the underground service lines generally consisted of a thin/sparse layer of rail ballast/gravel on top of service trench backfill generally characterised as greyish brown to orangish brown sandy gravelly silt. Light yellowish white stabilisation sand was encountered underneath the backfill and on top of underground service conduits at NDTP03 and NDTP04. The top of underground service conduits (assumed power) were encountered at NDTP01-NDTP06, at which point excavations were terminated. The maximum depth of excavation on service lines was 1.1m bgl (NDTP05 and NDTP06).

Hydrocarbon odours were noted at test location NDTP05 and diesel impacts were also indicated by elevated VOCs measured by the PID within the test pit (up to 109 ppm).

No indicators of diesel impacts were observed or measured with the PID at any of the other test locations excavated south of the Auxiliary Road on top of, and immediately surrounding the underground service lines.

Vee Drain

The soil conditions encountered in the test pits excavated south of the Auxiliary Road at the western end of the Vee drain generally consisted of a 0.05m thick layer of light yellowish grey sand on top of light brown sandy gravelly silt fill. The maximum depth of excavation within the Vee drain was 0.6m bgl (TP30); however, the maximum depth of excavation at test pit location TP17 was 0.2m bgl with the refusal occurred on a concrete apron to the drain under the road.

Hydrocarbon odours were noted and VOCs measured by the PID from the layer of fill beneath the sand at test pit location TP17 (480 ppm at 0.15m bgl).

No indicators of diesel impacts were observed or measured with the PID at test pit locations TP18, TP30 or TP31.

Groundwater was not encountered in either of these locations.

Area South of the Ramp Road

Ground conditions encountered in the test locations south of the Ramp Road rail consisted of a thin layer of medium to coarse angular gravel on top of compacted fill generally characterised as reddish brown silty gravelly sand and deeper brownish yellow to orangish brown sandy gravelly silt. The compacted fill was present to a depth of at least 2.5m bgl, the greatest depth of investigation south of the Ramp Road (BH11). No groundwater was encountered at any of these locations.

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Hydrocarbon odours were noted at test locations TP13 and TP16 and diesel impacts were also indicated by elevated VOCs measured by the PID within these test pits (up to 210 ppm and up to 570 ppm respectively).

No indicators of diesel impacts were observed or measured with the PID at any of the other test locations south of the Ramp Road.

6.6.2 Laboratory Testing Results

Results of the soil sample analyses were compared to the adopted assessment criteria as summarised in Section 6.5 and in the summary tables presented as attachments to this report. The NATA laboratory certificates for soil samples are included in Appendix D.

6.6.2.1 Initial Assessment

Test results are summarised in Table 4 and Table 5.

Table 4: Summary of Results – Initial Investigations

Area	Sample Locations	Results Summary
Spill location	BH13 – BH15	Hydrocarbons impacts exceeding relevant criteria identified from surface to ~0.5m bgl.
Container Pad	BH01 – BH10	No detections of TRH/BTEXN identified to exceed relevant screening criteria.
Under 1 Road, Auxiliary Road and Ramp Road rail lines, east of spill	TP10, TP21 – TP23, TP27, TP27A, TP34 – TP35, NDTP06	No significant impacts at majority of locations. Small hotspot identified extending to depth a TP35.
Under 1 Road and Auxiliary Road rail lines, west of spill	BH17, TP24 – TP26, TP28	Hydrocarbon impacts identified to extend to >2m. Elevated results exceeding screening criteria limited to upper 0.5m.
Under 1 Road and Auxiliary Road rail lines, south of spill	BH16, TP29	Hydrocarbons impacts exceeding relevant criteria identified from surface to ~0.5m bgl under Auxiliary Road rail line.
Under Ramp Road rail line, south of spill	TP11, TP15, NDTP05	Impacts identified in excess of screening criteria under rail line.
South of Ramp Road rail line, south of spill	BH11 – BH12, TP09, TP12 – TP14, TP16. TP33	No detections of TRH/BTEXN identified to exceed relevant screening criteria.
South of the Auxiliary Road at the western end of Vee drain	TP17 – TP20, TP30, TP36 – TP37, NDTP01 – NDTP04	No significant contamination indicators identified at majority of locations. Exceedances reported for relevant screening criteria from surface to depth of groundwater in the vicinity of the temporary sump.
South west of spill site, far side of culvert under road	TP31 – TP32	No evidence of contamination.
Northern Perimeter Road	TP01 – TP04	No evidence of contamination.
Edge of mangroves adjacent northern perimeter of the site	TP05 – TP08	No evidence of contamination.

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Table 5: Summary of Results – Delineation Investigations

Area	Sample Locations	Results Summary
Along length of electrical power line adjacent Vee drain	NDTP06 – NDTP10	Hydrocarbons impacts exceeding relevant criteria identified in service trench up to ~1.1m bgl.
East of spill in the vicinity of 1 Road, Auxiliary Road and Ramp Road rail line junctions	TP35	Hydrocarbons impacts exceeding relevant criteria identified up to ~1.05m bgl.
South of the Auxiliary Road at the western end of Vee drain	TP36 – TP37	Hydrocarbon impacts identified at depth ~>1.6m.

Elevated results from initial sampling events are shown on Figure 10 and a summary of exceedances is presented in Table 6.

Table 6: Summary of Exceedances (Investigations)

	Depth (m bgl)	Concentration Range (mg/kg)			
		TRH (C6-C10) (F1)	TRH (>C10-C16)	TRH (>C10-C16) (F2)	TRH (>C16-C34)
NEPM HSLs for Vapour Intrusion, Commercial / Industrial (Sand)	0-1m	260		NL	
	1-2m	370		NL	
	2-4m	630		NL	
	>4m	NL		NL	
NEPM ESLs, Commercial / Industrial (Coarse Soil)		215		170	1,700
NEPM MLs Commercial / Industrial (Coarse Soil)			1,000		3,500
Perimeter of Spill Location	<1m	270 – 440	24,000 – 27,000	24,000 – 27,000	20,000 – 23,000
Under 1 Road and Auxiliary Road rail lines, west of spill	<1m	43	1,200	1,200	990
Under 1 Road and Auxiliary Road rail lines, south of spill	<1m	<20	8,000	8,000	8,000
Under Ramp Road, south of spill	<1m	<20 – 100	610 – 17,000	610 - 17,000	1,900 - 15,000
Along length of electrical power line adjacent Vee drain	1.1m	210 – 590	14,000 – 31,000	14,000 – 31,000	10,000-20,000
South of the Auxiliary Road at the western end of Vee drain	<1m	<20	360 - 550	360 - 550	1,100 – 1,600
East of spill in the vicinity of 1 Road, Auxiliary Road and Ramp Road rail line junctions	<1m	<20 – 30	600 – 3,700	600 – 3,700	540 – 4,800

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Hydrocarbon impacts were identified in the vicinity of the spill and extending down the natural slope between the 1 Road and Auxiliary road rail lines and between the Auxiliary Road and Ramp Road rail lines with the Vee drain and service trench acting as a conduit towards the temporary sump excavated to capture diesel. Impacts do not exceed beyond this point under the road via the adjacent culvert.

Impacts were typically significantly higher in surface and near surface soils with evidence of percolation further into the soil profile at various locations including the spill site, service trench and temporary sump.

The field observations and results were used to inform diesel-impacted soil excavation works which are detailed in Section 7. The validation samples are grouped by the areas remediated as detailed in Section 7, summarised as:

- Area 1 – between 1 Road and Auxiliary Road rail lines, extending from asphalt hardstand in the west to rail junction.
- Area 2 – between Auxiliary Road and Ramp Road rail lines, extending from road and culvert in the west to rail junction in the east.
- Area 3 – south of Ramp Road rail line extending from south of the spill location in the east extending approximately 70m to the west.

Table 7 and Table 8 summarise the results of validation sampling after the initial excavation and further excavation works respectively.

Table 7: Summary of Exceedances (Initial Validations)

	Depth (m bgl)	Concentration Range (mg/kg)			
		TRH (C6-C10) (F1)	TRH (>C10-C16)	TRH (>C10-C16) (F2)	TRH (>C16-C34)
NEPM HSLs for Vapour Intrusion, Commercial / Industrial (Sand)	0-1m	260		NL	
	1-2m	370		NL	
	2-4m	630		NL	
	>4m	NL		NL	
NEPM ESLs, Commercial / Industrial (Coarse Soil)		215		170	1,700
NEPM MLs Commercial / Industrial (Coarse Soil)			1,000		3,500
Area 1	<1m	<20 – 220	300 – 25,000	300 – 25,000	840 – 38,000
Area 2 (inc Areas 2b and 2c)	<1m	<20 – 290	<50 – 20,000	<50 – 20,000	<100 – 19,000
Area 3	<1m	<20 – 220	<50 – 17,000	<50 – 17,000	<100 – 17,000

A summary of remediation works relating to the removal of soils considered impacted with diesel is detailed in Table 10. This includes additional remediation works completed following the receipt of the results presented in Table 7.

Results from final validation sampling events are shown on Figure 10 and a summary of exceedances is presented in Table 8. Final condition is further discussed in Section 7.

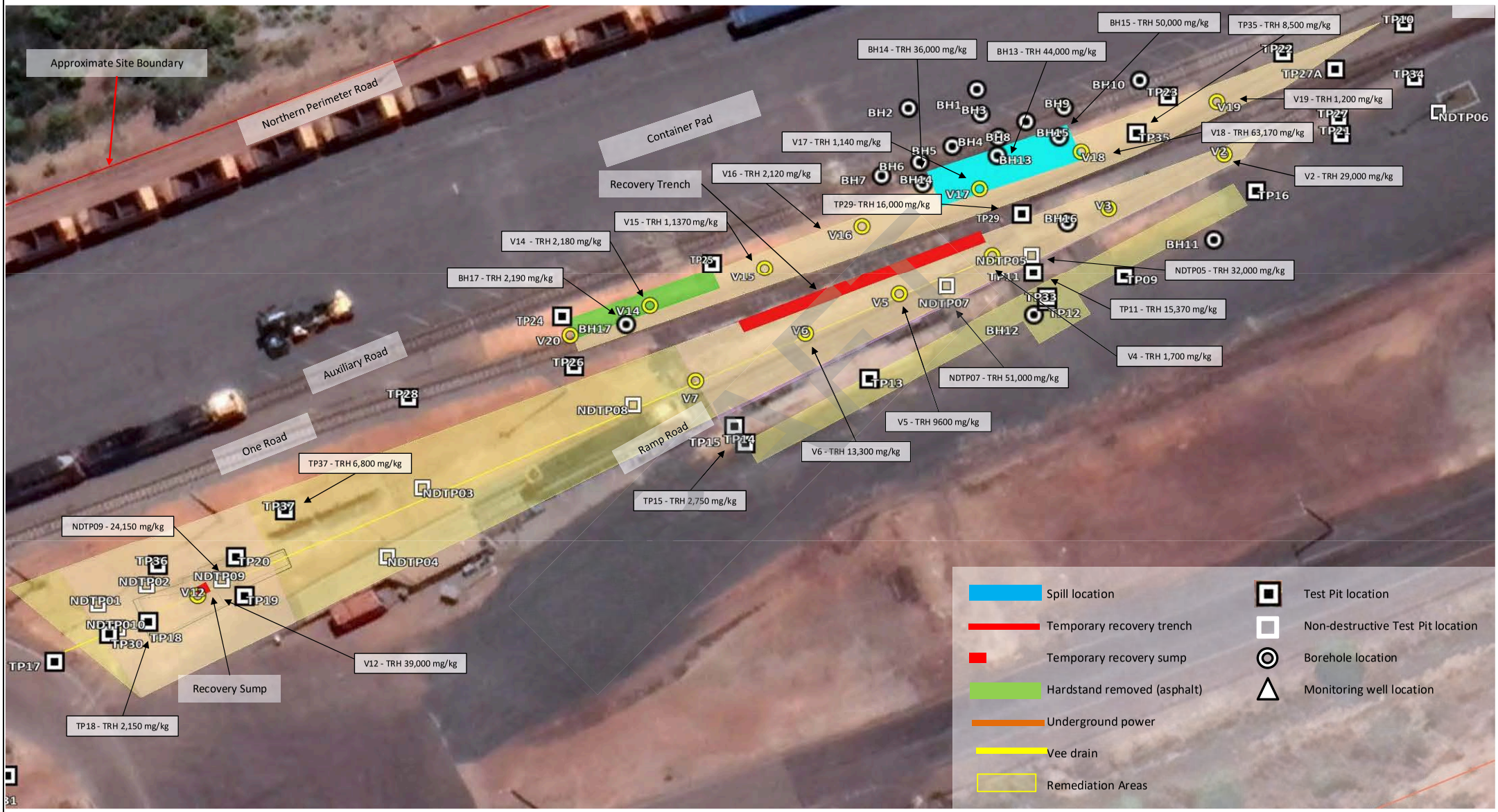
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Table 8: Summary of Final Conditions (Final Validations)

	Depth (m bgl)	Concentration Range (mg/kg)			
		TRH (C6-C10) (F1)	TRH (>C10-C16)	TRH (>C10-C16) (F2)	TRH (>C16-C34)
NEPM HSLs for Vapour Intrusion, Commercial / Industrial (Sand)	0-1m	260		NL	
	1-2m	370		NL	
	2-4m	630		NL	
	>4m	NL		NL	
NEPM ESLs, Commercial / Industrial (Coarse Soil)		215		170	1,700
NEPM Management Limits Commercial / Industrial (Coarse Soil)			1,000		3,500
Area 1 (in Area 1a)	<1m	<20	<50 – 160	<50 – 160	<100 – 1,500
Area 2 (exc Areas 2a, b, c and d)	<1m	<20	<50	<50	<100
Area 2a	<1m	<20	<50 – 4,100	<50 – 4,100	<100 – 6,600
Area 2b/c	<1m	<20 – 270	<50 – 11,000	<50 – 11,000	<100 – 11,000
Area 3	<1m	<20 – 220	<50 – 17,000	<50 – 17,000	<100 – 17,000

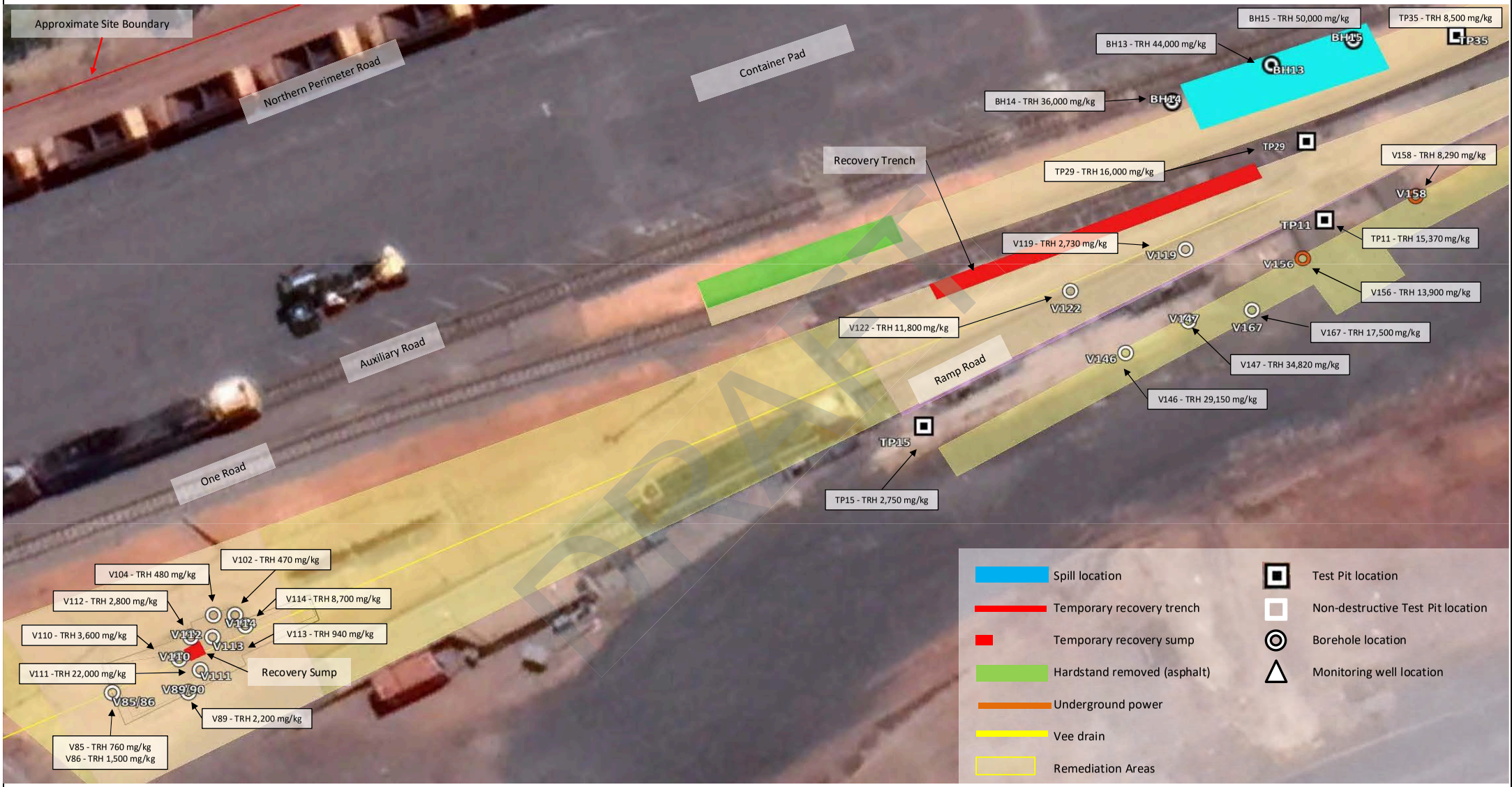
Remaining impacts are documented in Section 7 and presented in Figure 11.

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Project:	Detailed Site Investigation					FIGURE 10	Initial Investigation - Elevated Results ($TRH\ C_{10}$-C_{40})
Location:	Export Drive, Berrimah NT						
Job Ref: J168829	Drawn: VB	Checked: DB	Date: 25/03/21	Scale: As shown	Source: Google Earth		

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Project:	Detailed Site Investigation					FIGURE 11	Residual Impacts (TRH C_{10}-C_{40})
Location:	Export Drive, Berrimah NT						
Job Ref: J168829	Drawn: VB	Checked: DB	Date: 25/03/21	Scale: As shown	Source: Google Earth		

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6.6.3 Leachability Testing Results

Australian Standard Leaching Procedure (ASLP) analytical results are summarized in the leachate results table presented at the end of this report. Calculations are presented in the results summary tables and the NATA-accredited laboratory certificate of analysis provided in Appendix D.

Three soil subsamples (BH15, TP11 and TP29) collected from diesel impacted areas (beneath rail lines) were analysed. The highest TRH >C_{10}-C_{16} result was 1.2 mg/L and the average proportion of TRH leachate compared with TRH available in the parent sample was 0.157 %. The highest TRH >C_{16}-C_{34} leachate detected was 1.0 mg/L and the average proportion of TRH leachate compared with of TRH available in the parent sample was 0.124 %.

Toluene was reported in leachate in one sub-sample - 0.04 mg/L (BH15_0.25). The proportion of toluene leachate compared with toluene available in the parent sample was 30.77 %. All toluene leachates reported were less than the ANZECC 2018 marine water trigger value (99 % species protection) for all samples.

Xylene (o-xylene) was reported in leachate in one sub-sample - 0.04 mg/L (BH15_0.25). The proportion of o-xylene leachate comparted with o-xylene available in the parent sample was 7.27 %. No m- or p-xylene leachates were detected in any of the samples.

Three samples (1 Rd, Aux Rd and Ramp Rd) were also analysed for leachate using the US EPA 1314 method at SGS Laboratories. This method was selected as it provides a more detailed leachability assessment to enable further consideration of the risk of residual diesel in soil impacting runoff/stormwater discharging from site and/or diesel in soil migrating to groundwater.

Results (>C_{10}-C_{40}) are summarised as follows:

- 1 Rd – results ranged from 3.8 mg/L (first leachate pass) to 0.77 mg/L (final leachate pass).
- Aux Rd – results ranged from 72 mg/L to 4.6 mg/L.
- Ramp Rd – results ranged from 0.48 mg/L to 0.30 mg/L.

The results demonstrate a higher leachability potential when compared to the standard ASLP assessment, particularly relating to impacts present under Auxiliary Road, adjacent the original spill. This indicates a potential risk to groundwater and/or surface water via leachate collection and discharge.

The monitoring of sediment and stormwater has been captured in the GMMP to monitoring potential discharge resulting from diesel leaching from in situ materials. Refer to RAP (Section 10) and the supporting GMMP for details on risk management measures.

Analytical results and certificates of analysis are provided in Appendix D.

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6.7 Stockpiled Soils Assessment and Waste Classification

Impacted soil excavated during initial remediation works was stockpiled on a temporary lined bund on a construction pad to the west of the spill site (refer to Section 7 for more detail).

Stockpile sampling was conducted on 11 and 18 June 2020. Ten samples were collected during the first round of sampling to separately assess the contamination status of the most impacted soil collected from the diesel spill area. A further 11 samples were collected across the entire stockpile (estimated at approximately 800 m^3) during the second round of sampling.

Soil samples were analysed for TRH and BTEXN at a NATA-accredited laboratory.

Analytical results from the samples initially targeting the most impacted spoil (collected on 11 June) ranged from 8,900 – 54,000 mg/kg TPH C_{10}-C_{36} with an average of 33,730 mg/kg.

Analytical results from the secondary samples (collected on 18 June) ranged from 363 – 28,100 mg/kg TPH C_{10}-C_{36} with an average of 9,032 mg/kg TPH C_{10}-C_{36} and a 95 % UCL of 12,936 mg/kg TPH C_{10}-C_{36}, classified as Restricted Solid Waste as per NSW EPA (2014), relevant to local licensed landfill operators.

A further ~300 m^3 amount of soil was added to the stockpile as a result of further excavation works.

Waste classification results are presented in the results summary tables and the NATA-accredited laboratory certificates of analysis provided in Appendix D. A surveyed plan of the final stockpile is presented in Appendix C.

6.8 Residual Diesel Estimate

The results of soil sampling were used to estimate the amount of residual diesel which may still be present as a result of the spill following remedial activities. A number of assumptions are made in deriving the estimate as summarised in Table 9.

Table 9: Assumptions

Item	
Spill Event	20,000 L (approx.)
Recovered diesel free product	4,500 L (approx.)
Bulk density of diesel	0.832 kg/L
Volume of soil removed	• ~420 m^3 during initial remedial activities (greater impacts) • ~345 m^3 during chasing and validation works (lesser impacts)
Weight of soil removed	~1,060 t (volume of soil removed x 1.38 based on density of sandy silt)
Average Total Petroleum Hydrocarbons (C_{10}-C_{36}) in soil removed	• ~20,793 mg/kg (~20.793 g/kg) in initial remedial activities (i.e. Areas 1 and 2) • ~9,032 mg/kg (~9.032 g/kg) in subsequent remedial activities (i.e. Areas 2a, 2b, 2c and 3)
TPH (C6-C9) in soil removed	<20 mg/kg

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The volume calculation is derived as follows:

- *Weight of diesel in soil removed = average TPH (C_{10}-C_{36}) in soil removed (mg/kg) x weight of soil (kg) removed:*
  = (20,793 mg/kg x 579,600 kg) + (9,032 mg/kg x 476,100 kg)
  = ~16,352 kg
- *Volume of diesel in soil removed = weight of diesel in soil removed (kg) / bulk density of diesel (kg/L):*
  = 16,352 / 0.832
  = ~13,605 L
- *Volume of diesel removed = recovered diesel product (L) + volume of diesel in soil removed (L):*
  = 4,500 + 13,605
  = ~18,105 L
- *Volume of diesel remaining = spill volume (L) – volume of diesel removed (L)*
  = 20,000 – 18,105
  = ~1,895 L

Based on the above calculations, it is estimated that approximately 2,000 L of spilled diesel remains in-situ. This is predominantly situated under rail lines. A summary of in-situ impacts post-remediation is presented in Section 7.

6.9 Soil Investigation Result Summary

The diesel spill occurred adjacent the 1 Road Rail line, resulting in surface diesel contamination under this line and on to the land between the 1 Road Rail line and Auxiliary Road rail line. Diesel migrated across and under the Auxiliary Road rail line into the drainage line where it progressed downgradient towards the road culvert approximately 100 metres from the spill. The spill was intercepted here via the installation of a temporary sump. To a lesser extent, diesel migrated also below the Ramp Road rail siding.

The soil investigation confirmed that diesel impacts were present at the site area at concentrations exceeding the adopted environmental and human health criteria from NEPM as follows:

- Within the 1 Road rail line (total recoverable hydrocarbons (TRH) C_6-C_{10} minus BTEX) up to 440 mg/kg that may present a soil vapour risk to human health.
- Within and between the 1 Road, Auxiliary Road and Ramp Road rail lines (TRH >C_{10}-C_{40} up to 63,170 mg/kg) that present a risk to down-gradient ecological receptors and that present a potential light non-aqueous phase liquid (LNAPL)-related hazard.
- In underground services backfill between the Auxiliary Road and Ramp Road, directly south of the spill point lines (TRH >C_{10}-C_{40} at 32,000 mg/kg) that presents a risk to down-gradient ecological receptors and that present a potential LNAPL-related hazard.
- Within the western end of the Vee-drain, between/around the underground services crossover and the road underpass drain (TRH >C_{10}-C_{40} up to 39,000 mg/kg) that presents a risk to down-gradient ecological receptors.

Remediation activities have been undertaken concurrently with the assessment works and have addressed the majority of the issues noted above. These works and results are detailed in Sections 6.6 and 7.

A mass balance calculation estimated approximately 18,000 L of diesel had been recovered and that approximately 2,000 L of diesel remained in situ at the spill site.

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Leachate analytical results indicated residual TRH and BTEX in soils has some leachability potential which may cause groundwater impacts and may also impact on marine water ecological receptors. These risks are being managed via the implementation of ongoing stormwater and sediment monitoring governed under the GMMP prepared for the site.

A Remediation Action Plan (RAP) has been developed to include adopted management measures for the residual diesel impacts in soil. This RAP is included as Section 11 of this document.

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7 REMEDIAL WORKS SUMMARY

Remediation excavation of diesel-impacted soils was undertaken concurrently with DSI works from June to October 2020. Remediation excavation works were immediately directed by detection of elevated VOCs in the field with a PID or by collecting and analysing soil samples for TRH/BTEXN at a NATA-accredited laboratory.

Extents of remediation works were governed by access around operational rail lines and underground services. They are summarised as follows:

- Area 1 – between 1 Road and Auxiliary Road rail lines, extending from asphalt hardstand in the west to rail junction in the east covering an area of ~420m^2. Includes the location of the diesel spill. Excavated to 150mm below ground level.
- Area 1a – additional excavation within Area 1 in the immediate vicinity of the spill location, covering an area of 80m^2. Excavated to 0.1mm below surface.
- Area 2 – between Auxiliary Road and Ramp Road rail lines, extending from road and culvert in the west to rail junction in the east covering an area of ~1,700m^2. Excavated to 150mm below ground level.
- Area 2a – additional excavation within the eastern half of Area 2, covering an area of 150m^2. Excavated to 0.1m below surface across broader area and ~1.85m along recovery trench.
- Area 2b – additional excavation in the western end of Area 2 west of the temporary sump covering an area of ~50m^2. Excavated to 1.75m below surface.
- Area 2c – additional excavation in the western end of Area 2 east of the temporary sump along underground electrical service trench, covering an area of ~60m^2. Excavated to 1.6m below surface.
- Area 3 – south of Ramp Road rail line extending from south of the spill location in the east extending approximately 70m to the west covering an area of ~250m^2. Excavated to 150mm below ground level.

A summary of remediation works relating to the removal of soils considered impacted with diesel is detailed in Table 10. Figure 12 presents the areas referred to above.

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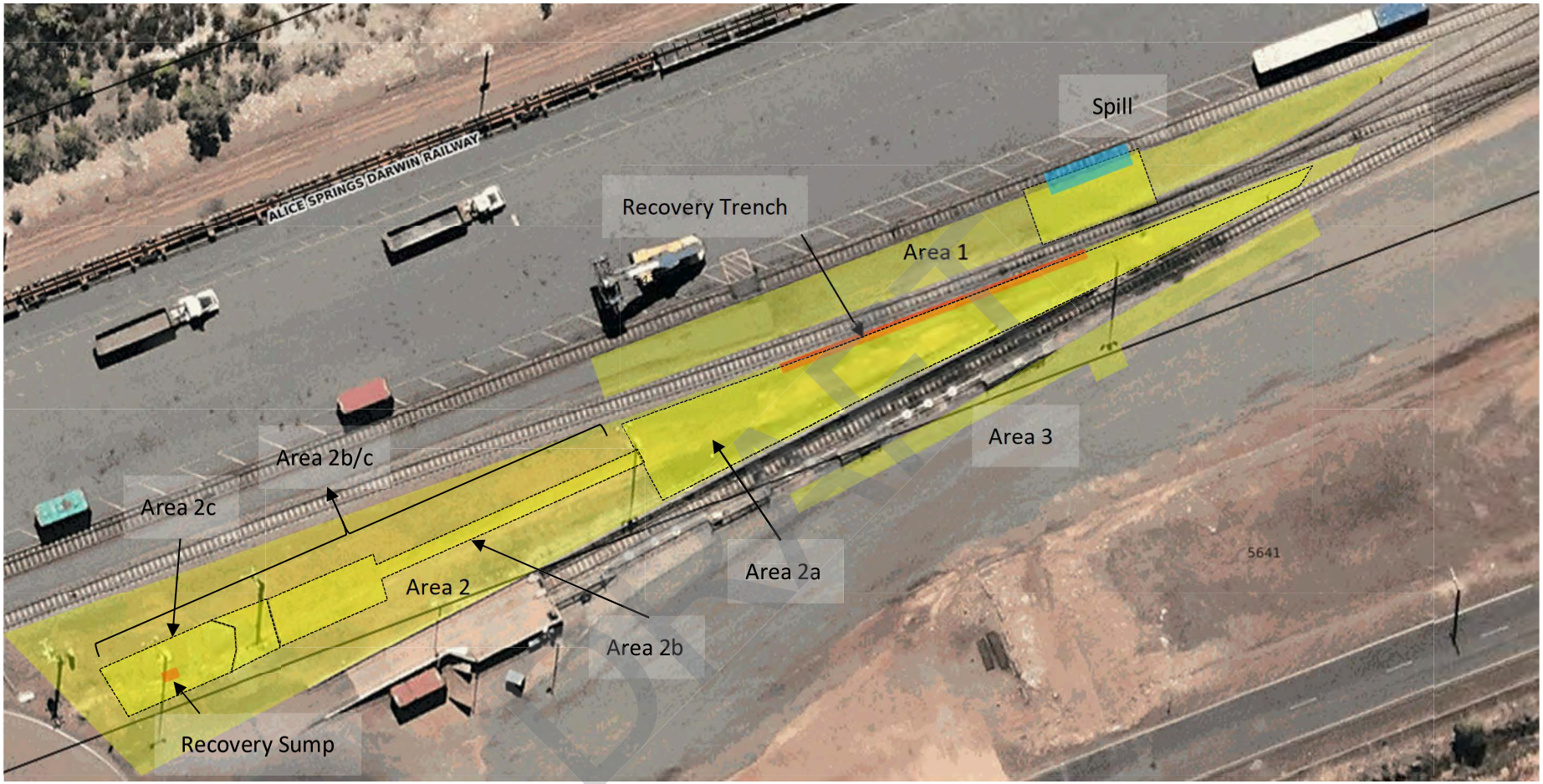


Figure 12: Remediation Areas (source: NR Maps)

Table 10: Remediation and Validation Works Locations

Area	Date	Sample Locations	References	Comments
Area 1	16 June 2020	V14 – V19	Figure 9a	~420m^2 excavated to an average depth of 150mm immediately following spill (~65m^3). Impacts reported adjacent spill location. Further 100mm (~10m^3) excavated prior to re-validation (V20 – V30).
Area 1a	24 August 2020	V20 – V30	Figure 9a	Indicative of current condition, refer Table 8.
Area 2	16 June 2020	V02 – V13	Figure 9a, b	~1,700m^2 excavated to an average depth of 150mm immediately following spill (~255m^3). Impacts reported along initial trench excavated to 2m (~100m^3). Further ~105m^3 excavated prior to re-validation (V116 – V126). Hotspots identified an investigated/excavated (see Areas 2b and 2c).
Area 2a	1 October 2020	V116 – V126	Figure 9a, b	Indicative of current condition, refer Table 8.
Area 2	25 August 2020	V31 – V56	N/A	Samples replaced with V57 – V70.
Area 2b	26 August 2020	V57 – V70	Figure 9b	Impacts reported to exceed one or more guidelines (see Table 7). Further 1.75m (~80-90m^3) excavated prior to re-validation (V85 – V115).
Area 2c	26 August 2020	V71 – V84	Figure 9b	Impacts reported to exceed one or more guidelines (see Table 7). Further ~100m^3 excavated prior to re-validation (V85 – V115).
Area 2b/c	22 September 2020	V85 – V115	Figure 9b	Indicative of current condition, refer Table 8.
Area 3	1 October 2020	V127 – V174	Figure 9c, d	~250m^2 excavated to an average depth of 150mm (~40m^3). Indicative of current condition, refer Table 8.
	12 October 2020	V175 – V178		
Summary				~625m^3 excavated to various depths across the three areas. Total volume of material survey in stockpile = ~800m^3. The balance is attributable to surface ballast collected during excavation works.

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Remaining diesel impacts are located as follows:

- Under rail lines:
    - 1 Road adjacent spill near surface – >C_6-C_{10} (270 – 440 mg/kg), TRH >C_{10}-C_{16} (20,000 – 27,000 mg/kg) and TRH >C_{16}-C_{34} (16,000 – 23,000 mg/kg) exceed ESLs and Management Limits. Impacts in excess of screening criteria do not exceed beyond 0.5m. Refer to results for BH13, BH14 and BH15.
    - Auxiliary Road and Ramp Road south of spill – >C_{10}-C_{16} (7,200 – 8,000 mg/kg), and TRH >C_{16}-C_{34} (7,800 – 8,000 mg/kg) exceed ESLs and Management Limits. Impacts in excess of screening criteria do not exceed beyond 0.5m. Refer to results for TP11 and TP29.
    - Ramp Road southwest of spill – >C_{10}-C_{16} (610 mg/kg), and TRH >C_{16}-C_{34} (1,900 mg/kg) exceed ESLs. Impacts in excess of screening criteria do not exceed beyond 0.5m. Refer to results for TP15.
- Area 2a – a small diesel hotspot was identified at TP35 (refer Figure 10). The test pit was excavated to 1.05m below surface. TRH >C_{10}-C_{16} (3,700mg/kg) and TRH >C_{16}-C_{34} (4,800 mg/kg) exceed ESLs and Management Limits.
- Area 2b/c
    - V85/86, V89, V102, V104 – >C_{10}-C_{16} (200 – 1,000 mg/kg) exceeds ESLs. Impacts in excavation walls are located at ~1m below surface (~1.5-2 m below ground level after reinstatement) and impacts in excavation base are located at the groundwater interface at ~2m below surface (~2-2.5 m below ground level after reinstatement).
    - V110, V112, V114 TRH >C_{10}-C_{16} (1,200 – 1,900 mg/kg) and TRH >C_{16}-C_{34} (1,800 – 6,900 mg/kg) exceed ESLs and Management Limits. All samples were collected from the base of the excavation at the groundwater interface at ~2m below surface (~3-3.5m below ground level after reinstatement).
    - V111 TRH C_6-C_{10} (270 mg/kg), >C_{10}-C_{16} (11,000 mg/kg) and TRH >C_{16}-C_{34} (11,000 mg/kg) exceed ESLs and Management Limits. This sample was collected from the base of the excavation at the groundwater interface at ~2m below surface (~3-3.5m below ground level after reinstatement).
- Area 3
    - V145, V146, V156, V158 TRH C_6-C_{10} (220 mg/kg), >C_{10}-C_{16} (1,400 – 17,000 mg/kg) and TRH >C_{16}-C_{34} (7,600 – 17,000 mg/kg) exceed ESLs and Management Limits. Samples were collected ~0.2m below ground surface in the northern wall of the excavation. Further excavation was not possible as this would have undermined the Ramp Road rail line.
    - V167 TRH >C_{10}-C_{16} (5,300 mg/kg), TRH >C_{16}-C_{34} (7,500 mg/kg) and TRH >C_{34}-C_{40} (4,700 mg/kg) exceed ESLs and Management Limits. Sample was collected at base of excavation.

All soil investigation locations are shown in Figure 8 and results are detailed in Sections 6.6.2 to 6.6.4. Photographs of the remediation activities are presented below.

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Photograph 1: Original Spill (30/05/20)



Photograph 2: Remediation works in Area 1 (31/05/20)



Photograph 3: Original Spill Migration into Area 2 facing west (30/05/20)



Photograph 4: Temporary Sump Preparation in west of Area 2 (30/05/20)



Photograph 5: Recovery Trench (east) and Initial Excavation works in Area 2 (01/06/20)

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Photograph 6: Recovery Trench (west) and Initial Excavation works in Area 2 (01/06/20)



Photograph 7: Recovery Trench extension and Initial Excavation works in Area 2 (01/06/20)



Photograph 8: Recovery Trench in Area 2 (02/06/20)



Photograph 9: Initial Excavation works in Area 1 (03/06/20)



Photograph 10: Stockpiled Soils from Areas 1 and 2 (05/06/20)



Photograph 11: Stockpiled Soils from Areas 1 and 2 (06/06/20)

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Photograph 12: Area 2, note presence of impacts under ballast (10/06/20)



Photograph 13: Stockpiled Soils from Areas 1 and 2 under plastic and further excavation works over plastic (12/06/20)

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Photograph 14: Remediation works looking east



Photograph 15: Excavation Between 1 Road Rail line and Auxiliary Road line looking east (Area 1)



Photograph 16: Area 2a facing Area 2b



Photograph 17: TP35 Hot Spot

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Photograph 18: Area 2b facing west



Photograph 19: Areas 2b and 2c facing east



Photograph 20: Underground Power Line Excavation in Area 2 looking east



Photograph 21: Area 2b/c facing north following further excavation around electrical conduits

8 GROUNDWATER INVESTIGATION

The soil results summarised in Sections 6 and 7 note the presence of petroleum hydrocarbons above and at groundwater interface, indicating a potential for groundwater impacts. Soil leachability results further confirmed this potential.

The groundwater investigation has comprised the installation, sampling and analyses of 11 groundwater monitoring wells on site. Groundwater investigations and monitoring results are presented in the sections below.

8.1 Scope of Work

The aims of the groundwater investigation were to:

- Assess impacts to groundwater as a result of the diesel spill;
- Further delineate the extent of impacts (if required); and
- Determine whether any groundwater impacts may pose a risk to human health and/or environment.

8.2 Groundwater Monitoring Well Installation

The groundwater monitoring wells that form part of this monitoring network were positioned to target groundwater at the spill area, down inferred gradient from the spill area, as well as upgradient of the spill site to assess the quality of incoming groundwater (to distinguish between the spill related and non-spill-related impacts). As a result of the complex drilling conditions (presence of cobbles at groundwater interface) two monitoring wells were duplicated as a result of redrilling to enable the appropriate installation of a monitoring well screen. MW03A was installed into deeper part of the uppermost aquifer or possibly in the second shallow aquifer.

The monitoring wells were installed using solid flight auger drilling techniques to depths of 4 – 5 metres below ground level. The wells were typically installed with three metre screened intervals at the base. A sand filter pack was installed to a minimum of 0.5m above the top of the screened interval and bentonite was used to seal the wells to the surface.

Justification for locating each is outlined in Table 11. Groundwater monitoring wells were constructed in accordance with "*Minimum Construction Requirements for Water Bores in Australia (2003)*" and surveyed by a qualified surveyor; logs and construction details are attached in Appendix E.

Table 11: Groundwater Monitoring Well Network Details

Location ID	Easting	Northing	Elevation – TOC* (mAHD**)	Screen Interval (from-to mbgl)	Target
MW01	708423.8	8620973	5.958	1.9 - 4.9	Impacts directly beneath spill point
MW01A	708416.9	8620987	5.921	1.8 - 4.8	Impacts immediately down inferred gradient (to be used if LNAPL[1] is observed at MW01)
MW02	708491.8	8620930	5.026	1.2 - 5.2	Background well, up-gradient of spill site
MW03	708498.1	8621017	5.891	6 - 8.4	Impacts down gradient from the spill
MW03A	708497.3	8621016	5.869	1.3 - 4.3	Impacts in deeper aquifer
MW04	708461.6	8621003	5.931	0.85 - 3.85	Impacts down gradient from the spill
MW04A	708460.6	8621003	5.867	0.4 - 3.4	Impacts down gradient from the spill
MW05	708374.7	8621004	5.249	1 - 4	Impacts at mangrove fringe

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Location ID	Easting	Northing	Elevation – TOC* (mAHD**)	Screen Interval (from-to mbgl)	Target
MW06	708470.5	8621040	5.262	1 - 4	Impacts at mangrove fringe
MW07	708398.1	8620980	5.906	1 - 5	Impacts down gradient from the spill
MW08	708521	8621026	5.970	1 - 5	Impacts down gradient from the spill

Notes:

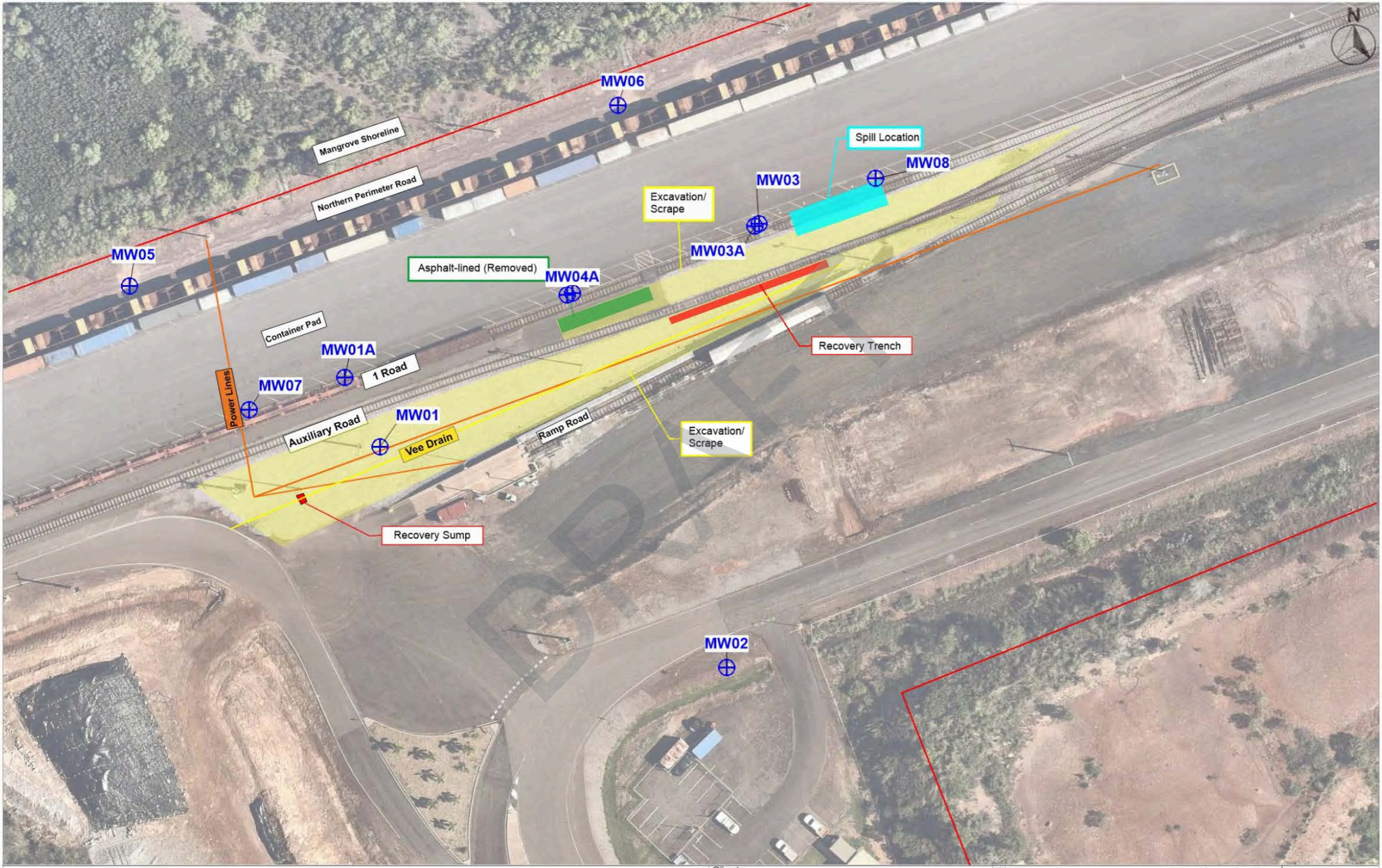
[1]LNAPL – light non-aqueous phase liquid (floating diesel fuel from the spill)

mbgl – metres below ground level

*TOC – top of casing for groundwater wells; GL – ground level for vapour points

**AHD = Australian Height Datum

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Legend

- Site boundary
- Groundwater Monitoring Well Locations

Date Data Collected: 30 Oct 2020
Source: Background Photomap courtesy of nearmap

Client:	One Rail Australia
Client No.	C105292
Project:	Diesel Spill Targeted Site Contamination Investigation
Job No.	J168829
Title:	Groundwater Monitoring Plan
Address:	Berrimah Freight Terminal - Export Drive, Berrimah NT
Approximate Scale	0 20 m
Drawn: AS	PM: DB
Date:	28/11/2020
File Name:	J168829 GW Plan
Figure No.	5

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Kew East, VIC 3102
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F: (03) 9896 8600
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8.3 Groundwater Sampling Methodology

The groundwater sampling has been conducted over two groundwater monitoring events (GME) as follows:

- **July GME -** gauging of water levels and sampling and analysis of groundwater from four wells (MW01, MW02, MW03 and MW04).
- **October GME -** gauging of water levels of all wells and sampling and analysis of groundwater in eight wells (MW01A, MW02, MW03, MW04, MW05, MW06, MW07 and MW08).
- **January 2021 GME -** gauging of water levels of all wells and sampling and analysis of groundwater in eight wells (MW01A, MW02, MW03, MW04, MW05, MW06, MW07 and MW08).

Prior to sampling, depth to groundwater levels were measured from the top of well casings using a water-product interface meter. The water-product interface meter was used to check for the potential presence of any separate phase hydrocarbons (e.g. floating diesel from the spill) in the groundwater monitoring wells.

The majority of groundwater wells were sampled using low-flow techniques. Groundwater purging and sampling was undertaken using a peristaltic water pump. Dedicated tubing was used and the pump was not submerged, therefore eliminating the need for the pump decontamination.

Low-flow sampling could not be undertaken in MW01 and MW03 (July GME), in MW01A, MW03 and MW04 (October GME) and in MW01A (January GME) as groundwater recharge into the monitoring well screens was not sufficient. These wells were purged dry to remove all stagnant water from the well casing and screens and groundwater samples were collected using dedicated bailers after the volume of recovered groundwater was sufficient to fill sampling containers. Separate bailers were used to sample the individual wells to prevent any cross contamination between wells.

Water quality parameters (pH, temperature, total dissolved solids, conductivity, oxidation reduction potential and dissolved oxygen) were monitored using a calibrated water quality meter. Samples were collected when water quality parameters had stabilised. Water levels were also monitored during low-flow sampling (MW02) to ensure that minimal drawdown occurred.

All groundwater samples collected were placed in containers provided by the analytical laboratories. The samples were stored on ice in a portable cooler immediately following sampling and were delivered under similar conditions to the National Association of Testing Authorities (NATA) accredited analytical laboratories with accompanying chain of custody documentation. The primary laboratory was Eurofins and the secondary laboratory was ALS. Both laboratories have NATA accreditation for the testing required.

Equipment calibration certificates and groundwater sampling records are presented in Appendix F.

8.4 Groundwater Analytical Program

All groundwater samples were analysed for:

- Total Recoverable Hydrocarbons (TRH); and
- Benzene, toluene, ethylbenzene, xylenes and naphthalene (BTEXN).

Results of the groundwater analyses are discussed in Section 8.6. Field duplicate and blank samples including rinsate blanks were also collected during the groundwater investigation. A discussion of the Quality Assurance (QA) and Quality Control (QC) procedures undertaken is presented in Section 9.

8.5 Groundwater Assessment Criteria

The risk-based approach for assessing groundwater contamination outlined in Schedule (B6) of the NEPM is based on protection of relevant (i.e. current or realistic) uses of groundwater.

The adopted assessment criteria are included in Table 12.

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Table 12: Adopted Assessment Criteria

Analyte	Groundwater HSL for vapour intrusion – Commercial/Industrial (2 m to <4 m)	Groundwater investigation level (GIL) (marine water)
C_6-C_{10} less BTEX (F1)	NL	-
>C_{10}-C_{16} less naphthalene (F2)	NL	-
Sum of >C10 – C34	-	0.3
Benzene	30	0.5
Toluene	NL	110*
Ethylbenzene	NL	0.05*
m-xylene	-	0.05*
o-xylene	NL	0.35**
p-xylene	NL	0.20**
Naphthalene	NL	0.05

* (ANZECC 2018)

**GIL for marine water not available, GIL for freshwater adopted alternatively

8.6 Groundwater Investigation Results

Groundwater monitoring events conducted in July and October 2020 and January 2021 are documented under separate cover. Results are summarised in the subsections below.

8.6.1 Groundwater Conditions

Groundwater was encountered at approximately 3.5 metres below ground level during drilling. Aquifer material was typically represented by gravelly silts.

Hydrocarbon odours were noted in soils at MW01 and MW04. Hydrocarbon odours were noted in MW01 and MW04 during the July 2020 GME. Approximately 0.06m and 0.02m of floating light nonaqueous phase liquid (LNAPL) was present at MW01 during the October and January GMEs respectively.

8.6.2 Field Measured Water Quality Parameters

Groundwater quality parameters were monitored during purging and before sampling with sampling records included in Appendix F. The final values of these parameters prior to sampling are summarised in Table 13.

Table 13: Field measured groundwater quality parameters

Well ID	Date sampled	Temp (°C)	pH	Electrical conductivity (µS/cm)	Total dissolved Solids (mg/L) **	Oxidation - reduction potential (mV)	Dissolved oxygen (% saturation)
JULY 2020							
MW01	30/07/20	30.5	4.61	11,514	7,370	171.6	39.2
MW02	30/07/20	31.5	5.16	14,341	9,180	198.5	10.0
MW03	30/07/20	30.9	4.91	21,480	13,750	226.4	57.9
MW04	30/07/20	31.6	6.93	17,779	11,380	200.9	64.2
OCTOBER 2020							
MW01A	14/10/20	33.4	6.31	97,551**	62,430**	113.7	40.8

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Well ID	Date sampled	Temp (°C)	pH	Electrical conductivity (µS/cm)	Total dissolved Solids (mg/L) **	Oxidation - reduction potential (mV)	Dissolved oxygen (% saturation)
MW02	14/10/20	33.6	5.10	16,093	10,300	159.6	30.3
MW03	14/10/20	33.5	5.16	26,860	17,190	169.4	44.9
MW04	14/10/20	33.2	6.15	13,088	8,375	144.4	71.3
MW05	30/10/20	33.6	5.55	36,676	23,470	97.9	2.3
MW06	30/10/20	33.7	4.77	23,275	14,895	147.3	3.5
MW07	30/10/20	35.8	5.25	14,205	9,090	118.8	27.6
MW08	30/10/20	36.0	6.23	18,678	11,950	3.0	17.9
JANUARY 2021							
MW01A	21/01/21	34.4	7.02	12,801	8,195	36.3	47.4
MW02	21/01/21	33.4	5.12	11,915	7,625	151.9	12.5
MW03	21/01/21	36.3	5.03	3573	2,290	133.3	8.4
MW04	21/01/21	34.6	5.26	5935	3,800	136.4	9.2
MW05	21/01/21	33.1	5.49	39,063	25,000	91.5	1.2
MW06	21/01/21	33.6	4.98	6384	4,085	162.1	3.5
MW07	21/01/21	35.4	5.71	16,722	10,070	33.6	11.3
MW08	21/01/21	36.7	5.15	5627	3,600	63.3	7.2

* Conversion factor of 0.64 used to convert field conductivity (µS/cm) to TDS (mg/L).

The salinity recorded for MW01A appeared to be significantly high when compared to the nearby wells MW01 and MW07. A salinity verification check was conducted on 8 December 2020 which involved the purging of MW01 and MW01A using disposable bailers to remove stagnant water from the well casing after which groundwater salinity was measured using a calibrated water quality meter. The measured salinity at MW01 was 6,626 µS/cm (or 3,620 mg/L as TDS) and 21,824 µS/cm (or 12,700 mg/L as TDS) at MW01A.

Table 13 indicates the following:

- The groundwater in the area is slightly acidic with pH values ranging from 4.61 at MW01 (July GME) to 7.02 in MW01A (January GME).
- Groundwater is characterised as saline with the calculated total dissolved solids ranging from 3,600mg/L (MW08 – January GME) to 25,000mg/L (MW05 – January GME).
- Measured levels of ORP and dissolved oxygen are generally indicative of oxidation conditions, potentially favourable for natural biodegradation of petroleum hydrocarbons (associated with the diesel spill).

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8.6.3 Groundwater Flow Direction

The water levels measured in the July GMEare summarised in Table 14.

Table 14: Groundwater Levels – July GME

Well ID	Well Elevation (mAHD)	Standing Water Level (mbtoc)	GW Elevation (mAHD)
MW01	5.958	2.994	2.964
MW02	5.026	1.788	3.238
MW03	5.891	2.910	2.981
MW04	5.867	2.963	2.904

The inferred groundwater flow was in a north-northwesterly direction, i.e. from the site towards the intertidal mangrove community. The groundwater level contours also indicate that MW02 is a background monitoring well.

Water density adjustments have been made to the measured groundwater levels as a result of the large range in salinity reported for the sampled wells in the October GME. As the groundwater salinity varies across the aquifer, the measured groundwater heads have been converted to equivalent freshwater heads using the ratio between saline and freshwater density. Density adjustments were made using the following commonly applied formula presented in the majority of hydrogeological textbooks (e.g. Fetter *et al*):

Hf=Hn(ρn/ρf)*Hn+Z, where:

Hf – fresh groundwater head (m)

ρf – freshwater density (kg/m3)

ρn – density of water in the well "n" (kg/m3)

Hn – water head in well "n" (m)

Z – reference point (m Australian Height Datum, AHD)

The gauged groundwater levels together with the density corrected water levels (using freshwater density of 995 kg/m3 at 30°C) are shown in Table 15.

Table 15: SWL – October GME

Well ID	Well Elevation (mAHD)	Standing Water Level (mbtoc)	SWL Elevation (mAHD)	Calculated Water Density* (kg/m^3)	Density corrected levels (mAHD)
MW01	5.958	2.699	3.259	998.38	3.265
MW01A	5.921	2.674	3.247	1,004.01**	3.267
MW02	5.026	1.807	3.219	1,001.43	3.237
MW03	5.891	2.651	3.240	1,006.78	3.260
MW04	5.931	2.686	3.245	1,000.27	3.249
MW05	5.249	2.003	3.246	1,011.09	3.267
MW06	5.262	2.022	3.240	1,005.01	3.260
MW07	5.906	2.658	3.248	1,001.00	3.260
MW08	5.970	2.739	3.231	1,003.32	3.250

*Calculated based on field measured salinity and temperature

** EC/temperature results from 8 December were used.

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Based on the gauging results, it appeared no discernible direction of groundwater flow can be inferred because the majority of water level values differ from each other by only a few millimetres, with the lowest water level elevation calculated to be at MW02 (installed as an upgradient well which by comparison had the highest elevation in July 2020). Such groundwater level pattern may be representative of a wet season.

The water levels measured in the January GME are summarised in Table 16.

Table 16: SWL – January GME

Well ID	Well Elevation (mAHD)	Standing Water Level (mbtoc)	GW Elevation (mAHD)
MW01A	5.921	2.444	3.447
MW02	5.026	1.174	3.852
MW03	5.891	2.428	3.463
MW04	5.931	2.459	3.472
MW05	5.249	1.776	3.473
MW06	5.262	1.798	3.464
MW07	5.906	2.430	3.476
MW08	5.970	2.514	3.456

Similarly to the October GME, based on the gauging results, it appeared no discernible direction of groundwater flow can be inferred because the majority of water level values differ from each other by only a few millimetres, with the lowest water level elevation calculated to be at MW02. Such groundwater level pattern may be representative of a wet season.

8.6.4 Groundwater Analytical Results

Summary tables of the groundwater analysis results are presented at the end of this report. Laboratory certificates are attached in Appendix G.

The presence of petroleum hydrocarbons was reported for two groundwater wells, MW01 and MW04. Both wells are located down inferred hydraulic gradient (as per July flow direction) and adjacent the spill site (MW04) and diesel spill/collection area (MW01). The heavier hydrocarbon fractions (>C_{10} to C_{34}) are typical of diesel fractions and, therefore, their presence in groundwater is likely to be associated with the diesel spill.

Reported results from the other groundwater monitoring wells were all below laboratory reporting levels. Elevated results above laboratory limits of reporting are summarised in Table 17.

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Table 17: Summary of Elevated Results

Monitoring Well	Sample Date	F2: TRH (C_{10}-C_{16} less naphthalene)	F3: TRH (>C_{16}-C_{34})	Total TRH (C_{10}-C_{40})	Ethylbenzene	O-Xylene
Trigger Value	-	-	-	-	50	350
MW01	30-Jul-20	140	<100	150	2	3
MW01	14-Oct-20	Not sampled due to 6cm of LNAPL				
MW01	21-Jan-21	Not sampled due to 2cm of LNAPL				
MW01A	14-Oct-20	140	600	600	2	3
MW04	30-Jul-20	240	400	650	<1	1
MW04	31-Oct-20	520	1,300	1,820	<1	1
MW04	21-Jan-21	<50	300	<100	<1	1
MW03	21-Jan-21	<50	300	300	<1	1

From Table 17, an increase in hydrocarbon concentrations is noted between July and October 2020 monitoring events, including the presence of LNAPL in MW01. A decrease is noted between the October and January events. However, hydrocarbon concentrations were detected in MW03 for the first time in the January event This indicates that hydrocarbon contaminated groundwater plume may have been migrating to the north west.

8.6.5 Groundwater Results Summary

The reported petroleum hydrocarbons were mainly represented by heavier fractions (>C_{10} to C_{40}) which are typical of diesel fuel. The groundwater sampling results and the presence of LNAPL in MW01 indicates that the diesel fuel from the spill area has generally moved subsurface in a north-westerly direction towards the intertidal mangrove community and is consistent with the soil investigation results.

Further discussion regarding the nature and extent of the impacts is provided in Section 10.

8.7 Groundwater Monitoring and Management Plan (GMMP)

To protect groundwater at the site a Groundwater Monitoring and Management Plan (GMMP) was developed and implemented. The GMMP is submitted under separate cover. The GMMP was developed to accomplish the following primary objectives:

- To conduct regular monitoring of groundwater underlying soils with reported residual diesel impacts in order to advise if impacts in soil cause groundwater contamination.
- To conduct regular monitoring of surface water and sediment in order to advise if residual impacts are leaching from the insitu impacted material.
- If diesel impacts to groundwater become evident, to confirm whether or not they present a risk to offsite receptors located down inferred groundwater hydraulic gradient of the site (assessed to be to the north-west during the July 2020 monitoring event).
- To establish mechanisms and management measures should unacceptable risk to human health and/or the environment be identified.

The GMMP included a set of trigger levels which were designed to assess a change in risk to on-site and down-gradient receptors. Based on the GMMP two additional quarterly groundwater monitoring events will be conducted to verify the concentrations and migration of the identified groundwater impacts.

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9 QUALITY ASSURANCE / QUALITY CONTROL

9.1 Internal Laboratory QA / QC

The results of the internal quality assurance programs of the analytical laboratories used for soil and groundwater analysis are presented with the certificates in Appendix D for soil and Appendix G for groundwater. Appropriate internal QA / QC were reported by both primary (Eurofins) and secondary (ALS) laboratories as follows:

- Accuracy (measured by laboratory spike and surrogate recovery samples) generally within 70% - 130% recovery.
- Precision (measured by duplicate sample analysis) within 30% relative percentage difference.
- Minimum 95% completeness (measured by total number of analyses within acceptable limits).

9.2 Field Duplicate – Soil Analysis

Field duplicate samples were collected and analysed at the primary (Eurofins) and secondary (ALS) laboratories as outlined in Table 18.

Table 18: Soil Duplicate Analyses

Primary Sample	Field Duplicate – Primary Laboratory (Eurofins)	Field Duplicate – Primary Laboratory (ALS)
BH03_2.00	QA05 - BTEXN and TRH	QA06 - BTEXN and TRH
BH08A_3.50	QA07 - BTEXN and TRH	QC008 - BTEXN and TRH
TP15_0.3	QA13 - BTEXN and TRH	QCA14- BTEXN and TRH
TP22_0.35	QA15 – BTEXN and TRH	QA16 – BTEXN and TRH
SP01	QA19 – BTEXN and TRH	QA20 - BTEXN and TRH
V18_0.03	VQA01 - BTEXN and TRH	VQA02 - BTEXN and TRH
V23	QA01 - BTEXN and TRH	QA02 - BTEXN and TRH
V80	QA03 - BTEXN and TRH	QA04 - BTEXN and TRH
V85	QA07 - BTEXN and TRH	QA08 - BTEXN and TRH
V105	QA09 - BTEXN and TRH	QA10 - BTEXN and TRH

Notes: BTEXN= Benzene, Ethylbenzene, Toluene, Xylene and Naphthalene
TRH = total recoverable hydrocarbons

The frequency of field duplicate analyses for the main potential contaminants of concern is acceptable when compared to the 1 per 20 analyses recommended in the Australian Standard AS4482.1. A table summarising the field duplicate results for the investigation is attached at the end of this report.

The majority of intra- and inter-laboratory duplicate relative percent differences (RPDs) calculated were considered acceptable i.e. < 50 %. This was with the exception of the following hydrocarbon fractions:

- TP15_0.3 / QA13 – TRH>C_{16}-C_{34} (53%)
- TP15_0.3 / QA13 – TRH>C_{34}-C_{40} (59%)
- TP15_0.3 / QA13 – TRH>C_{29}-C_{36} (51%)
- V18_0.03 / VQA01 – TRH>C_{34}-C_{40} (109%)
- V18_0.03 / VQA01 – TPH C_{29}-C_{36} (58%)

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- V23 / QA01 – TPH C_{15}-C_{28} (85%)
- V23 /QA01 – TPH >C_{10}-C_{36} (85%)
- V85 / QA07 – TRH>C_{10}-C_{16} (119%)
- V85 / QA07 – TRH>C_{16}-C_{34} (105%)
- V85 / QA07 – C10-C_{16} (119%)
- V85 / QA07 – TPH C_{10}-C_{14} (106%)
- V85 / QA07 – TRH >C_{15}-C_{28} (105%)
- V85 / QA07 – TPH >C_{10}-C_{36} (105%)

This was assessed to be a result of non-uniform impact of soil by spilled hydrocarbons due to natural heterogeneity of soils.

9.3 Field Duplicate – Groundwater Analysis

July GME

Field duplicates (*MWQA01* and *MWQA02*, duplicates of *MW01*) were collected during the July sampling event and analysed at the primary (Eurofins) and secondary (ALS) laboratories for TRH and BTEXN). The majority of inter and intra laboratory duplicate analyses had RPD values below the recommended comparison criteria of 50%, with the following exceptions:

Intra-laboratory

- TRH C_{10}-C_{14} (143 %);
- TRH C_6-C_{10} (67 %);
- TRH >C_{10}-C_{16} (139 %); and
- TRH >C_{10}-C_{16} (less naphthalene) (139 %).

Inter-laboratory

- Ethylbenzene (67 %)
- TRH C_{10}-C_{14} (143 %);
- TRH C_6-C_{10} (67 %);
- TRH >C_{10}-C_{16} (173 %); and
- TRH >C_{10}-C_{16} (less naphthalene) (94 %).

These variations may be attributable to differences in suspended solids in the primary and duplicate containers. All primary/intra-laboratory results with RPDs outside acceptable limits had the primary sample result reported as the greater concentration. All primary/inter-laboratory results with RPDs outside acceptable limits had the primary sample result reported as the greater concentration. In addition, all reported results were below the adopted water quality criteria therefore these variations are not considered significant in terms of this groundwater monitoring event.

October GME

Field duplicates (*QA01* and *QA02*, duplicates of *MW02*) were collected during the initial October sampling event on 14 October and analysed at the primary (Eurofins) and secondary (ALS) laboratories for TRH and BTEXN). Field duplicates (*QC01* and *QC01A*, duplicates of *MW05*) were collected during the second October sampling event on 31 October and analysed at the primary (Eurofins) and secondary (ALS) laboratories for TRH and BTEXN).

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Duplicate analytical results were assessed by calculating relative percent differences between primary sample results and duplicate sample results. All of the inter and intra laboratory duplicate groundwater analyses had RPD values below the recommended comparison criteria of 50%.

January GME

Field duplicates (*QC01* and *QC01A*, duplicates of *MW02*) were collected during the January event and analysed at the primary (Eurofins) and secondary (ALS) laboratories for TRH and BTEXN).

Duplicate analytical results were assessed by calculating relative percent differences between primary sample results and duplicate sample results. All of the inter and intra laboratory duplicate groundwater analyses had RPD values below the recommended comparison criteria of 50%.

A table summarising the duplicate sample results is presented at the end of this report.

9.4 Blanks

Rinsate blank samples and trip blank samples were collected during soil and groundwater investigations and analysed at the primary laboratory. Rinsate samples were collected from decontaminated sampling equipment each day of drilling or sampling while trip blank samples were used at a rate of 1 per batch of samples. A summary of the blank samples tested is summarised in at the end of this report.

All rinsate and trip blanks collected during soil and groundwater investigations were reported to have all TRH/BTEXN concentration below the limits of reporting (LORs) indicating that no cross contamination occurred between locations and during the transportation of samples.

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10 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) for the site has been developed based on the information presented earlier in this report.

Information relating to the geology and hydrogeology relevant to development of the CSM is presented in Section 3.1. The information below relates primarily to the chemicals of interest, their nature and extent and ultimately potential receptors and possible exposure pathways.

10.1 Chemicals of Interest

The chemicals of interest exceeding one or more of the adopted assessment criteria in soil and groundwater are related to the surface spill of the diesel fuel during the automatic refueling of a diesel locomotive.

The chemicals of interest therefore are petroleum hydrocarbons of the diesel fuel related fractions C_6 to C_{34} and BTEXN.

10.2 Persistence and Mobility of Chemicals of Concern

The mobility of total petroleum hydrocarbons generally ranges from low to high depending on the hydrocarbon molecular structure and weight. The persistence of petroleum hydrocarbons also ranges from low to high, also dependent on hydrocarbon molecular structure and weight.

The mobility of lighter hydrocarbon fractions (C_6-C_{10}), benzene, ethylbenzene and xylenes ranges from moderate to high and the persistence of these chemicals ranges from low to moderate depending on molecular structure, weight, water solubility and volatile properties.

Heavier hydrocarbon fractions (C_{10}+) are less mobile compared to lighter fractions but more persistent in the environment.

All petroleum hydrocarbons in the subsurface generally dissipate over time via volatilisation and natural biodegradation processes under aerobic conditions.

10.3 Nature and Extents of Identified Impacts

10.3.1 Light Non-Aqueous Phase Liquid (LNAPL)

After the diesel spill, the presence of diesel fuel was identified to be floating on groundwater (in the form of light non-aqueous phase liquid, LNAPL) in monitoring well MW01. This well is located in the vicinity of the extents of the diesel spill area shown on **Error! Reference source not found.**. The presence of LNAPL was not observed in any of the other monitoring wells indicating that the LNAPL extent has been generally delineated to the north west and east.

10.3.2 Soil

The identified soil impacts appear to extend in a west south westerly direction from the spill area. The extent of initial surface impacts was limited to the areas identified as “Excavation Scrape” on Figure 8.

The distribution of hydrocarbons in soils expressed as reported concentrations of the most representative diesel fuel hydrocarbon fractions (>C_{10} to C_{40}) is shown on Figure 10. This figure demonstrates general delineation of soil impacts in east and south westerly directions.

The most severe soil impacts were identified at near the surface and at depth near the spill site, in proximity to the encountered groundwater levels. The vertical extent of the impacts was limited by groundwater levels.

Impacts remain in situ in some areas located beneath existing rail lines. Excavation of impacted material has been undertaken to the extent practicable including the excavation of impacted material beneath subsurface

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power lines. Removal of residual impacts under rail lines is not considered feasible, subsequently the in situ impacts are to be monitoring via the implementation of a GMMP, including the assessment of surface water and sediment condition.

10.3.3 Groundwater

The dry season groundwater flow direction is inferred to be in a north westerly direction towards the intertidal mangrove community. No discernible direction of groundwater flow could be determined based on the data from the October and January GMEs after which time wet season rainfall is likely to be influencing flow direction (or lack thereof).

Considering that in situ hydrocarbon impacted soils are located at the groundwater interface the impacted soil will likely act as ongoing secondary source (primary source being the initial release of diesel fuel) of hydrocarbon impacts in groundwater.

The identified impacts in groundwater increased in MW01 and MW04 between the July and October GMEs including the presence of LNAPL in MW01. This indicates that groundwater hydrocarbon plume may be migrating towards the north west. It is noted that the data set is limited given monitoring period being less than 12 months in duration. Plume stability will be better understood in subsequent monitoring events conducted following the removal of as much impacted material as practicable.

10.4 Potential Receptors and Exposure Pathways

Human and ecological receptors that could potentially be exposed to contamination at the diesel spill site may include:

- Onsite workers.
- Site visitors who may be spending some amount of time onsite.
- Future construction workers involved in any potential site development/repair work.
- Future maintenance workers, who may be required to maintain or repair various areas, including underground infrastructure at the site.
- Potential groundwater users.
- Potential environmental receptor of the intertidal mangrove community.

As indicated in the ASC NEPM (Schedule B4), '*The fundamental concept of risk assessment is that there should be an exposure pathway linking the source of contamination and the exposed population. Where this linkage exists, an assessment of the nature and significance of the exposure pathway is required to determine the level of risk.*'

Potential risks to human health and ecological receptors are summarised in Table 19.

Table 19: Potential Exposure Pathways and Risks to Receptors

Receptors	Potential Exposure Pathways Considered	Potential Risks identified from Exposure Pathways
Contractors and Site Visitors	**Inhalation**	A potential source-pathway-receptor linkage exists for the inhalation pathway due to the presence of volatile chemicals (such petroleum hydrocarbons) in the soil profile and in groundwater at depth. Although the reported concentrations in soil exceeded HSLs contractors and sit visitors will not be exposed to vapours for a long period of time. As such, this linkage is unlikely to cause human health impacts for the site visitors/contractors.

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Receptors	Potential Exposure Pathways Considered	Potential Risks identified from Exposure Pathways
	Dermal	A source-pathway-receptor linkage has not been identified for the dermal pathway, as the majority of reported residual impacts in soil were detected subsurface. And as such, the visitors are unlikely to be directly exposed to this contamination. As for contractors involved in any excavations at the spill area an appropriate environmental management plan (EMP) will have to be prepared to minimise potential risks to contractors' health.
	Ingestion	A source-pathway-receptor linkage has been identified only for contractors involved in the work associated with excavations at the impacted soil area. To manage risks to contractors' health an appropriate environmental management plan (EMP) will have to be prepared.
Permanent Site Workers	**Inhalation**	A potential source-pathway-receptor linkage exists for the inhalation pathway due to the presence of volatile chemicals (such petroleum hydrocarbons) in the soil near the surface and groundwater at depth. The reported residual concentrations in soil exceeded the adopted HSLs for commercial/industrial land use and therefore there is a risk to the human health of the permanent onsite workers (if present). If a prolonged exposure to the vapours is expected, direct soil vapour measurement and a quantitative human health risk assessment should be conducted as pre the NEPM requirements.
	Dermal	A source-pathway-receptor linkage does not exist for the dermal pathway, if no intrusive works (e.g. excavations) are undertaken at the site area. If such work is planned an environmental management plan (EMP) should be developed and this plan should address the assessment of risks to the human health of the workers.
	Ingestion	A source-pathway-receptor linkage does not exist for the ingestion pathway, if no intrusive works (e.g. excavations) are undertaken at the site area. If such work is planned an environmental management plan (EMP) should be developed and this plan should address the assessment of risks to the human health of the workers.
Groundwater Users	**Ingestion, dermal, inhalation**	A source-pathway-receptor linkage has not been identified for the potential users of groundwater due to the absence of registered groundwater bores in the area. Furthermore, the groundwater beneath the spill area is highly saline may not be used for drinking and/or irrigation purposes.
Environmental	**Direct contact with potentially contaminated water discharged in the intertidal mangrove community and/or Darwin Harbour**	A potential source-pathway-receptor linkage has not been identified as no groundwater impacts were reported for the monitoring wells located along the edge of the mangrove fringe. The linkage, however, may appear in the future if groundwater plume migrates towards this area. A Groundwater Monitoring and Management Plan (GMMP) has been prepared and is being implemented to monitor the plume migration in the future. The GMMP includes a set of the management measures to minimise the risk to the environmental receptors. The GMMP includes monitoring of stormwater and surface water to support in the management of potential risks to stormwater from residual impacts.

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As indicated in Table 19 the Site in its current condition does not pose an unacceptable risk to the identified human health and environmental receptors. However, the risk to the receptors may change if:

- Site development occurs involving excavation of contaminated soils; or
- Contaminated groundwater reaches the intertidal mangrove community.

To manage ongoing risk additional measures are required, refer to Section 12.2 for more information.

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11 REMEDIATION ACTION PLAN

11.1 Introduction

11.1.1 Background

A Remediation Action Plan (RAP) framework was prepared to support immediate response actions following the occurrence of the diesel spill, refer Section 1.3.

Remediation works have been conducted concurrently with ongoing assessment works detailed within this DSI. Further justification for actions completed to date and proposed future actions are detailed herein.

11.1.2 Objectives

The overarching objective of this RAP is to provide the methodology for site remediation and validation in accordance with the Northern Territory Contaminated Land Guideline and the NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999* (ASC NEPM).

The objective of the remediation works is to address potential risk to human health and the environment from the diesel in soil and groundwater under the site, so that the site and surrounding areas are suitable for on-going similar land use.

11.1.3 RAP Overview

This RAP includes the following:

- Summarises the nature and extent of diesel contamination associated with the contamination event identified in previous investigations;
- Specifies the adopted remediation strategy and its rationale for both the soil currently stockpiled on site and also diesel contaminated soil and groundwater under the site;
- Sets remediation goals (adopted acceptance criteria) that ensure the remediated site will be suitable for the intended land use and will pose no unacceptable risk to human health; and
- Document requirements for further risk assessments and/or ongoing monitoring.

11.2 Completed Investigations and Remediation Activities

11.2.1 Initial Response Remediation (May to November 2020)

One Rail has undertaken spill clean-up works including the following:

- Excavation of a temporary, approximately 0.3 m deep sump downgradient of the spill to collect surface diesel to be pumped out and removed;
- Placement of absorbent materials between the spill and downstream drain to the south-west of the spill;
- Removal of soils impacted by diesel from the stormwater swale drain to the south-west of the spill site;
- Removal of approximately 800 m^3 soils impacted by diesel as far as is reasonably practicable within and surrounding the vicinity of the rail line infrastructure; and
- Impacted soil that has been excavated is being temporarily stored on and under heavy duty plastic sheeting on an elevated pad for further sampling and assessments.

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11.2.2 Residual Impacts in Soil

Diesel-impacted materials have been removed concurrently during on-going assessment works. Soil excavation and validation works are summarised as follows:

- The soil investigation confirmed that following the spill diesel impacts were present:
    - Within the 1 Road rail line (total recoverable hydrocarbons (TRH) C_6-C_{10} minus benzene, toluene, ethylbenzene and xylene (BTEX) up to 440 mg/kg) that present a potential soil vapour risk to human health.
    - Within and between the 1 Road, Auxiliary Road and Ramp Road rail lines (TRH >C_{10}-C_{40} up to 63,170 mg/kg) that present a risk to down-gradient ecological receptors and that present a potential light non-aqueous phase liquid (LNAPL)-related hazard.
    - In underground services backfill between the Auxiliary Road and Ramp Road, directly south of the spill point lines (TRH >C_{10}-C_{40} at 32,000 mg/kg) that presents a risk to down-gradient ecological receptors and that present a potential LNAPL-related hazard.
    - Within the western end of the Vee-drain, between/around the underground services crossover and the road underpass drain (TRH >C_{10}-C_{40} up 39,000 mg/kg) that present a risk to down-gradient ecological receptors.
- Following the completion of soil remedial activities in which approximately 800m3 of impacted materials were removed, impacted materials remain:
    - Under the rail lines adjacent the spill to depths of approximately 0.5m below surface. This includes In the walls of excavations underlying rails lines in Areas 2 and 3 where excavation could not extend further without damaging the integrity of the rail lines.
    - In the base of backfilled excavations where extended to the groundwater interface in and around the location of the temporary sump.
- A mass balance calculation estimated approximately 18,8105 L of diesel had been recovered and that approximately 2,000 L of diesel remained in situ at the spill site.

Leachate analytical results indicated potential mobility of TRH. Subsequently, this risk is to be managed via the implementation of the GMMP and ongoing monitoring of surface water and sediment quality.

11.3 Soil and Groundwater Condition

11.3.1 Summary – Soil Condition

Hydrocarbon impacts remain insitu under the Auxiliary Rd and Ramp Rd rail lines and at the groundwater interface at a number of locations along the spill site. The majority of impacted materials have been excavated and stockpiled.

In addition to diesel contaminated soil beneath the site (refer Section 11.2.2), approximately 800m^3 of diesel impacted soil is currently stockpiled on the site. At the time of preparing the DSI, the material is classified as Restricted solid waste as per NSW EPA (2014), relevant to local licensed landfill operators.

11.3.2 Summary – Groundwater Condition

Groundwater was identified at depths between 2.2 and 4 metres beneath the surface in the eleven monitoring wells installed. Hydrocarbon impacts have been reported in three of the monitoring wells (MW01, MW01A and MW04) located in the vicinity of the spill area.

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11.4 Hazard Identification

The following sections detail site specific consideration of:

- The proposed Site use;
- Characteristics of the potential contaminants of concern; and
- Potential exposure pathways and receptors which require protection.

11.4.1 Proposed Site Use

The Site will remain an operational rail yard.

11.4.2 Characteristics of the Potential Contaminants

The primary contaminant of concern is petroleum hydrocarbons and volatile organic compounds including BTEXN compounds (benzene, toluene, ethyl benzene, xylenes and naphthalene). The following sections summarise the characteristics of these potential contaminants (NEPM, 2013)

Total Petroleum Hydrocarbons

Natural gas, crude oil, tars, and asphalt are types of petroleum hydrocarbons. The word petroleum means "rock oil" or "oil from the earth". Total Petroleum Hydrocarbons (TPHs) are used to describe mixtures of organic compounds found in or derived from crude oil that has the potential to be most toxic. It is made up of hydrogen and carbon but may also contain sulfur, nitrogen, heavy metals, and oxygen compounds. Most products that contain TPHs can burn easily. Some are clear or light-coloured liquids that evaporate easily, and others are thick, dark liquids or semi-solids that do not evaporate and many of these products (gasoline, kerosene etc) have oily odours.

The composition of petroleum hydrocarbons varies slightly by its source, but the toxic properties are consistent being extremely toxic components of high concern. If exposures are high it can cause fatigue, headache, nausea, and drowsiness. When exposure is stopped, symptoms will go away but if exposure takes a longer time permanent damage to the central nervous system can occur.

The mobility of total petroleum hydrocarbons ranges from low to high depending on the hydrocarbon molecular structure and weight. The persistence of petroleum hydrocarbons also ranges from low to high, dependent on hydrocarbon molecular structure and weight. Heavier hydrocarbon fractions (C_{10}+) are less mobile compared to lighter fractions but more persistent in the environment. Petroleum hydrocarbons in the subsurface generally dissipate over time via volatilisation and natural biodegradation processes.

BTEXN Compounds

Benzene has the highest toxicity of the BTEXN compounds. Benzene occurs naturally in fossil fuels and is produced incidentally in the course of natural processes and human activities that involve the combustion of organic matter such as wood, coal and petroleum products.

The critical human health effects from long term exposure to benzene are bone marrow depression and leukaemia, specifically acute non-lymphocytic leukaemia (also known as acute myeloid leukaemia). Benzene is classified as a human carcinogen.

The mobility and persistence lighter hydrocarbon fractions (C_6-C_{10}), benzene, ethylbenzene and xylenes ranges from moderate to high and the persistence of these chemicals ranges from low to moderate. In the subsurface these chemicals generally dissipate over time via volatilisation and may undergo natural biodegradation under aerobic conditions.

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11.4.3 Potential Receptors and Exposure Pathways

Human and ecological receptors that could potentially be exposed to contamination at the diesel spill site may include:

- Site visitors who may be spending some amount of time onsite.
- Future construction workers involved in any potential site development.
- Future maintenance workers, who may be required to maintain or repair various areas, including underground infrastructure at the site.
- Potential groundwater users.
- Potential environmental receptor of the intertidal mangrove community.

As indicated in the ASC NEPM (Schedule B4), '*The fundamental concept of risk assessment is that there should be an exposure pathway linking the source of contamination and the exposed population. Where this linkage exists, an assessment of the nature and significance of the exposure pathway is required to determine the level of risk*.'

Potential risks to human health and ecological receptors are detailed in Section 10.4.

As indicated in Table 19 the site in its current condition does not pose an unacceptable risk to the identified human health and environmental receptors. However, the risk to the receptors may change if:

- Site development occurs involving excavation of contaminated soils; or
- Groundwater is extracted for any human consumption; or
- Contaminated groundwater reaches the coastal area.

With hydrocarbon impacted soils located at the groundwater interface the impacted soil will likely act as ongoing secondary source (primary source being the initial release of diesel fuel) of hydrocarbon impacts in groundwater.

11.5 Remediation Objectives and Options

11.5.1 Remediation Goals and Objectives

At the completion of the remediation works, the goal is for the site to be suitable for the proposed end use, providing adequate protection of human health, property and the environment.

The objectives of the remediation are to:

1. Minimise the potential for any risks to the identified receptors identified in the previous section; and
2. Ensure that any impacted soils that are/have been removed are managed appropriately to mitigate risks to possible sensitive receptors (both human and environmental) during the remediation works.

Remediation options have been considered in the following sections with regard for Principle 16 of the NEPM, which states that for site clean-up and/or management:

- Preferred Options include: -
    - On-site treatment of the contamination so that it is destroyed or the associated risk is reduced to an acceptable level: and
    - Off-site treatment of excavated soil, so that the contamination is destroyed or the associated risk is reduced to an acceptable level, after which soil is returned to the site.
- Other options (where above are not practical) include:
    - Consolidation and isolation of the soil on site by containment with a properly designed barrier; and

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- Removal of contaminated material to an approved site or facility, followed, where necessary, by replacement with appropriate material; or
- Where the assessment indicates remediation would have no net environmental benefit or would have a net adverse environmental effect, implementation of an appropriate management strategy.

11.5.2 Options Assessment

11.5.2.1 In Situ Impacted Soil

Diesel-impacted soils have been removed along the extent between the Auxiliary Road and Ramp Road rail lines to the extent that any further excavation will extend beneath existing rail lines. This is not considered a feasible approach at present, in situ impacts are to be assessed via the ongoing monitoring of groundwater, surface water and sediment under the guidance of a GMMP. This risk is considered manageable given the volume of successful recovery and the mitigation measures put in place to monitor potential residual impacts. The GMMP includes monitoring of groundwater, surface water and sediment for potential impacts and provides trigger levels for further assessment/mitigation should an increased, unacceptable risk to human health of the environment be identified.

11.5.2.2 Contaminated Soil Stockpile

Approximately 800m^3 of diesel impacted soil has been stockpiled on site. It was temporarily stored a plastic-lined pad and covered, refer Photograph 22. An evaluation of the available remediation options for remediation of this material are presented in Table 20.



Photograph 22: Diesel-Impacted Soil Stockpile

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Table 20: Remediation Options Assessment – Stockpiled Soil

Remediation option	Relative Cost	Feasibility*	Rationale
Treatment on site (i.e. land farming)	Low	A	Hydrocarbons can be readily broken down in soil through a process referred to as Land Farming, where stockpiled soils are regularly turned so that the contamination is volatilized from the soil. There is space on the site for this process to be undertaken which renders this a suitable option.
Disposal off-site to licensed landfill	High	C	Unfeasible and high cost (relative to other options) given the volume of material and considerable haulage requirements that would be needed to dispose of the material.
On-site containment	Low-Moderate	B	This option would involve the excavation of an on-site containment cell, and the burial of excavated material within the cell. The containment cell would need to be above the groundwater level (to prevent this material from being an on-going source of groundwater contamination), have a clean fill capping layer (to prevent direct contact exposure), and should be designed and constructed in a way to minimise the infiltration of contaminants leaching into groundwater from rainfall. Ongoing monitoring/management would be required to confirm the containment cell is not impacting groundwater. This is one of the non-preferred approach under Principle 16 of the NEPM.

*NOTES:

A – Achieves Remediation Goals. Logistically and financially feasible

B – Achieves Remediation Goals. Logistically and financially feasible, however is not considered to be the optimal solution.

C – Could potentially achieve remediation goals, however logistically and/or financially unfeasible

D – Does not achieve required remediation goals – not considered further

11.5.2.3 Groundwater

Diesel-impacted groundwater has been identified on the site in within the impacted soil area. Potential groundwater remediation options are summarised in Table 21.

Table 21: Remediation Options Assessment – Groundwater

Remediation option	Relative Cost	Feasibility*	Rationale
Pump and Treat	High	C	Pump and treat technologies may be employed to recover diesel product remaining in groundwater. Prior to implementation of this technology, a series of aquifer pumping tests would be required to further assess the hydraulic properties of the aquifer. However, groundwater recovery has been shown to be low during sampling in some monitoring wells.
Multiphase Extraction	Very High	C	Multiphase extraction uses a high vacuum system to recover diesel and dissolved impacts, while also extracting vapours. This is conducted through the use of a vacuum truck or a permanent vacuum well system. Success of these systems is dependent on favourable aquifer conditions, and successful trials.

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Remediation option	Relative Cost	Feasibility*	Rationale
Passive Skimming (or other manual recover methods)	Moderate	B	This involves the skimming of floating diesel from the groundwater from groundwater bores. The rate of recovery is dependent on the permeability of the formation, groundwater gradients, and the frequency that the skimmers are emptied. The cost includes the purchase and ongoing maintenance of skimmers.
Soil Vapour Extraction / Air Sparging	Very High	C	This involves introducing air via a compressor into the aquifer to promote bioremediation, and can be linked with soil vapour extraction, to accelerate the remediation process. The introduction of air promotes bioremediation, while also stripping volatile components of hydrocarbon impacts from the aquifer. Stripped volatiles are collected by the soil vapour extraction system. This approach is better suited to more volatile contaminants (e.g. petrol), and requires specific aquifer conditions, which would require a series of aquifer and spare tests.
Reactive Barrier Walls / Containment	Very High	C	This involves the construction of a barrier system that prevents movement of impacted groundwater. A containment wall would require significant excavation and the installation of a cement-bentonite slurry wall. A reactive barrier would require the installation of a medium that encourages remediation as groundwater passes through it. This requires extensive pilot trials and is rarely used in small scale contamination scenarios.
Monitored Natural Attenuation (MNA)	Low	A	MNA involves allowing the contamination to naturally breakdown where naturally occurring bacteria consume hydrocarbons. This natural attenuation can be enhanced by the addition of oxygen and/or nutrients in certain situations. The effectiveness of this approach is dependent on the natural aquifer conditions, and the nature of the contaminant. It does not work well with contaminants that at levels that are toxic to bacteria (such as pure diesel, LNAPL), and primary source removal should be undertaken first if feasible. This approach is considered suitable where there is an absence of impacts along the fringe of the nearby sensitive receptors (intertidal zone/mangrove community – see results for MW05 and MW06), and where timeframes for remediation are not critical.

*NOTES:

A – Achieves Remediation Goals. Logistically and financially feasible

B – Achieves Remediation Goals. Logistically and financially feasible, however is not considered to be the optimal solution.

C – Could potentially achieve remediation goals, however logistically and/or financially unfeasible

D – Does not achieve required remediation goals – not considered further.

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11.5.2.4 Preferred Remediation Option

Given the abovementioned rationale, the optimal remedial approach selected is:

- Primary source removal via excavation of diesel-impacted soil to extents practicable around existing infrastructure.
- On-site landfarming of impacted soil stockpile and retention/re-use of this material on-site following remediation.
- Ongoing monitoring to confirm that natural attenuation of groundwater is occurring.
- Ongoing monitoring of sediment and stormwater to assess potential impacts resulting from remaining impacted material situated under the rail lines and as part of onsite landfarming if the material is to remain onsite.

The remediation scope of works is detailed in Section 11.6.

11.6 Remedial Action Plan

11.6.1 Preliminary Works

Given the nature of the proposed remediation (excavation of impacted material, land farming of stockpiled impacted soil and natural attenuation of groundwater), many of the items that would be required for more complex remediation tasks are not considered warranted. A summary of preliminary items that should be considered are presented in Table 22.

Table 22: Preliminary Works Recommendations

Item	Recommendation
Community Consultation	Consultation with the regulatory authorities is recommended to inform them of the general remediation works being conducted. Adjacent properties are unlikely to be impacted by this spill. A formal community engagement plan is not considered warranted in this instance.
Work Health and Safety Planning	Work Health and Safety measures for the proposed works are not considered to be significantly more onerous than standard civil works. Stockpile management works may generate some odours to plant operators, appropriate PPE to filter out diesel fumes should be supplied during these works.
Site Access	The works will involve the spreading, and occasional turning of ~800m^3 of odourous soil. A formal site management plan may not be required, however direct access to this soil should be discouraged, through the use of a temporary fence, bunting, and/or appropriate signage.
Environmental Management	Environmental management measures should be implemented prior to commencement of the works, to ensure environmental impacts are minimised from potential: • Dust generation/ erosion • Rainfall runoff and/or infiltration • Odour generation

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11.6.2 Soil Stockpile

Works to be conducted to address the current contaminated soil stockpile located on site include:

- Preparation of an appropriate surface layer on the site that is impermeable, and placement of soils in windrows, approximately 0.5m high, for bioremediation.
- Prepare an environmental management plan and implement measures to ensure water runoff, infiltration and dust issues will not adversely affect the surrounding environment.
- Establishment of remediation endpoint criteria. Given the current and future likely land use scenarios, criteria associated with Open Space/Recreational use published in the NEPM should be considered to be suitable.
- Pre-remediation sampling and analysis of soils has been completed. Sampling on a six-monthly basis is considered appropriate to assess biodegradation progress, until the remediation endpoint criteria are met.
- Regular turning of the windrows (suggested monthly) to aerate the soil, and addition of nutrients (e.g. fertilisers) if considered necessary to increase the rate of biodegradation.
- Collect validation samples beneath the remediation area to ensure remediation of subsurface soils has not occurred.
- If impacts are detected beneath the remediation area additional soil excavation/remediation may be required and the above remediation steps may need to be repeated.
- At the completion of the remediation, prepare a post-remediation validation certificate and:
    - Re-use soil on-site as appropriate; and/or
    - Identify appropriate off-site re-use options ensuring that expectations of any receiving site are met.

11.6.3 In-situ Impacted Soil

As presented in Section 11.4.3, data collected to date demonstrates that the in-situ soil impacts are considered to pose a risk, albeit not an unacceptable risk at present. However, if ongoing groundwater, sediment and stormwater monitoring presents evidence that impacts to groundwater/surface water are increasing, further remediation measures may be warranted (e.g. stormwater treatment, sediment capture etc). This is to be addressed in the annual review of the GMMP and the RAP component of this DSI.

In-situ impacts are to be managed under the guidance of a Site Management Plan (SMP) and/or Environmental Management Plan, to be prepared.

11.6.4 Groundwater

Works to be conducted to address the diesel contaminated groundwater plume include:

- Development of a Groundwater Monitoring and Management Plan (GMMP) - complete.
- Undertaking of GMEs under guidance of GMMP.
- Review the data set annually to assess the behaviour of the contamination plume and reassess the need for ongoing monitoring.

11.7 Roles & Responsibilities

The following roles have been established for the remediation works as presented in Table 23.

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Table 23: Remedial Roles and Responsibilities

Title	Name	Phone	Email
One Rail Australia			
Environment Manager	Adam Reed	0458 628 406	Adam.reed@1rail.com.au
TBA (onsite role)	TBA	TBA	
TBC (Contractor)			
Project Manager	TBA	-	-
Site Project Manager	TBA	-	-
Greencap (Environmental Consultant)			
Project Manager	Dylan Burford	0436 471 235	dylan.burford@greencap.com.au
Field Supervisor	Varun Bhagwat	0428 829 444	varun.bhagwat@greencap.com.au

The remediation works are to be conducted by the Contractor (TBC) and overseen and validated by Greencap (Environmental Consultant). For the purposes of this document the following roles and responsibilities are proposed:

- Client – Responsible for the overall direction of the remedial works;
- TBC (Contractor) – Responsible for the performance of the remedial works in accordance with this RAP.
- Greencap – Environmental Consultant responsible for overseeing remedial works and ensuring the requirements of this RAP are followed.

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12 CONCLUSIONS AND RECOMMENDATIONS

12.1 Conclusions

Greencap was commissioned by One Rail Australia to assist in the response to a diesel spill that occurred on the premises on 30 May 2020. Works to date have included onsite investigations, the development of a remediation action plan framework, a GMMP and the preparation of this DSI.

The objectives of this DSI were to:

- Delineate the vertical and lateral extent of the diesel spill.
- Assess the mobility of contaminants still present in the spill site.
- Assess risks to the human health and environment.
- Provide further guidance on the future site management.
- Prepare DSI report.

The scope of work for this DSI has comprised:

- A desktop study of the local and regional environmental characteristics including local geology and hydrogeology;
- Excavation of 37 test pits, drilling for soil bores at 17 locations, non-destructive test pitting at 10 locations, collection of 178 surface soil validation samples and subsequent soil sampling and laboratory analysis of soil samples;
- Installation and sampling of 11 groundwater monitoring wells; and
- Preparation of this DSI report.

Soil Investigation

Significant diesel impacts occurred to soils along the drainage line between and below the Auxiliary Road and Ramp Road rail lines. The spill migrated from the original location on the 1 Road rail line into sub-ballast materials and south into the unsealed ground between the 1 Road and Auxiliary Road rail lines. Diesel then migrated west between the rail lines and south over and under the Auxiliary Road rail lines where it collected in the Vee drain towards the road culvert approximately 100 m to the west at which point a temporary sump was excavated to halt flow and recover spilled diesel. To a lesser degree diesel also migrated beneath the Ramp Road rail line. Subsurface impacts, typically with the surface 0.5 m were observed throughout these areas.

Diesel-impacted soils were excavated to the extents practicable with the majority of validation results indicating successful removal of impacted materials. Final and validation analytical results confirmed residual hydrocarbon impacts in soil remain present:

- Beneath the 1 Road, Auxiliary Road and Ramp Road rail lines, presenting either a risk to human health (if encountered) and/or to down-gradient ecological receptors (if mobile). These impacts also present a potential light non-aqueous phase liquid (LNAPL)-related hazard.
- Within the deeper soils at the groundwater interface (typically at the western end of the Vee drain) that present a risk to down-gradient ecological receptors (if mobile).

A mass balance calculation estimated approximately 18,000 L of diesel had been recovered either directly as free phase product or within spoil excavated during remedial activities. The calculation indicated approximately 2,000 L of diesel remains in situ within at the spill site.

Leachate analytical results indicated that in situ TRH is potentially partially mobile, thereby requiring ongoing monitoring of impact to groundwater and potential leaching in surface water and sediment run-off.

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As outlined by the conceptual site model, a risk of soil hydrocarbon vapour exposure to onsite workers working in the vicinity of the 1 Road rail line exists, albeit considered adequately manageable under the guise of an Environmental Management Plan and/or Site Management Plan. Given the near proximity to the intertidal zone/mangrove community, the risk to off-site human/ecological receptors via stormwater runoff and/or groundwater migration should continue to be monitored.

The impacted-soil stockpile is currently considered classified as Restricted Solid Waste as per NSW EPA (2014).

LNAPL

The presence of LNAPL was identified in one groundwater monitoring well (MW01). Based on the investigation results it was interpreted that LNAPL has limited mobility which is to be further monitored (refer to GMMP).

Groundwater Investigation

The presence of hydrocarbon impacts in groundwater was reported in two of eleven groundwater monitoring wells installed. The reported petroleum hydrocarbons were mainly represented by heavier fractions (>C_{10} to C_{40}) which are typical of diesel fuel. The groundwater sampling results and the presence of LNAPL in MW01 indicates that the diesel fuel from the spill area has generally moved subsurface in a north-westerly direction towards the intertidal mangrove community and is consistent with the soil investigation results.

The groundwater impacts are likely associated with the ongoing secondary source of hydrocarbon impacts in groundwater.

Potential Receptors and Exposure Pathways

Human and ecological receptors that could potentially be exposed to contamination at the diesel spill site may include:

- Onsite workers.
- Site visitors and contractors who may be spending some amount of time onsite.
- Potential groundwater users.
- Potential environmental receptor of the intertidal mangrove community and the Darwin Harbour.

The assessment to date indicates that the site in its current condition does not pose an unacceptable risk to the identified human health and environmental receptors. However, the risk to the receptors may change if:

- Site development occurs involving excavation of contaminated soils; or
- Groundwater is extracted for any human consumption; or
- Contaminated groundwater reaches the intertidal area.

12.2 Recommendations

The following works are recommended:

- Develop and implement a Groundwater Monitoring and Management Plan (GMMP) to include monitoring of groundwater, surface water and sediment;
- Implement the Remediation Action Plan presented in this DSI;
- Review success of RAP during remedial works (impacted stockpile) and implementation of GMMP;
- Develop an Environmental Management Plan / Site Management Plan; and
- Consider undertaking predictive modelling using the Risk-Based Corrective Action (RBCA) analytical model or similar to predict future plume migration and chemical concentrations at potential sensitive receptors.

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13 REFERENCES

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Going Further in Managing Risk

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Diesel Spill – Detailed Site Investigation

One Rail Australia

Berrimah Freight Terminal, Export Drive, Berrimah NT

RESULTS SUMMARY TABLES (INCLUDING QAQC)

						Inorganic	TRH						TPH					BTEXN						
						Moisture Content (dried @ 103°C)	C6-C10	C6-C10 - BTEX (F1)	TRH >C10-C16	C10-C16 - Napth (F2)	TRH >C16-C34	TRH >C34-C40	C10 - C40 (Sum of)	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of)	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene Total	Naphthalene
						%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
					LOR	1	20	20	50	50	100	100	100	20	20	50	50	50	0.1	0.1	0.1	0.2	0.1	0.3	0.5
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																									
0-1m								260		NL									3	NL	NL			230	NL
1-2m								370		NL									3	NL	NL			NL	NL
2-4m								630		NL									3	NL	NL			NL	NL
>4m								NL		NL									3	NL	NL			NL	NL
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil								215		170	1700	3300							75	165	135			180	370
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil							700		1000		3500	10000													
Location	Area	Depth (m)	Field_ID	Sample_Date	Lab_Report_#																				
SOIL BORE SAMPLES																									
BH03		0	BH03-0.00	4/06/2020	724546	5.4	<20	<20	<50	<50	110	110	220	<20	<20	90	70	160	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH03		0.6	BH03-0.60	4/06/2020	724546	11	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH03		2	BH03-2.00	4/06/2020	724546	6.8	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH04		0	BH04-0.00	4/06/2020	724546	5	<20	<20	<50	<50	160	180	340	**<20**	**<20**	120	120	240	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH06		0.7	BH06-0.70	4/06/2020	724546	8.6	<20	<20	<50	<50	<100	<100	<100	**<20**	**<20**	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH07		0.5	BH07-0.50	4/06/2020	724546	10	<20	<20	<50	<50	<100	<100	<100	**<20**	**<20**	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH07		1.35	BH07-1.35	4/06/2020	724546	8.3	<20	<20	<50	<50	<100	<100	**<100**	**<20**	**<20**	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH08		2.5	BH08A-2.50	4/06/2020	724546	7.1	<20	<20	<50	<50	<100	<100	**<100**	<20	**<20**	**<50**	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH08		3.5	BH08A-3.50	4/06/2020	724546	18	<20	<20	<50	<50	<100	<100	**<100**	<20	**<20**	**<50**	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH12		0.03	BH12-0.03	4/06/2020	724546	4.7	<20	<20	<50	<50	180	**230**	**410**	**<20**	**<20**	**96**	170	266	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH13		0.25	BH13-0.25	5/06/2020	724546	9	290	270	24000	24000	20000	<10,000	**44000**	**<200**	15000	**32000**	<5000	47000	<1	2.7	1.1	8.9	6.4	15	<5
BH13		0.55	BH13-0.55	5/06/2020	724546	15	<20	<20	<50	<50	<100	**<100**	**<100**	**<20**	<20	**<50**	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH14		0.25	BH14-0.25	5/06/2020	724546	3.8	470	430	20000	20000	16000	<10,000	**36000**	**<200**	**13000**	26000	<5000	39000	<1	6.1	4	20	12	32	<5
BH14		0.6	BH14-0.60	5/06/2020	724546	11	<20	<20	<50	<50	**<100**	**<100**	**<100**	**<20**	**<20**	82	<50	82	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH14		0.9	BH14-0.90	5/06/2020	724546	7.9	<20	<20	140	140	**150**	**<100**	**290**	**<20**	**79**	220	<50	299	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH14		3.1	BH14-3.10	5/06/2020	724546	17	<20	<20	<50	<50	**<100**	<100	**<100**	**<20**	**<20**	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH15		0.25	BH15-0.25	5/06/2020	724546	8.1	480	440	27000	27000	23000	<10,000	**50000**	**<200**	**18000**	36000	<5000	54000	<1	5.2	2.6	17	11	28	<5
BH15		0.3	BH15-0.30	5/06/2020	724546	7.8	<20	<20	**550**	550	**730**	**<100**	**1280**	**<20**	270	1000	<50	1270	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH15		0.8	BH15-0.80	5/06/2020	724546	6.9	<20	<20	**<50**	**<50**	<100	**<100**	**<100**	**<20**	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH15		3.05	BH15-3.05	5/06/2020	724546	15	<20	<20	**<50**	**<50**	<100	**<100**	**<100**	**<20**	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH16		0	BH16-0.00	5/06/2020	724546	7	<20	<20	**<50**	**<50**	**<100**	**<100**	**<100**	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH16		0.3	BH16-0.30	5/06/2020	724546	9.3	<20	<20	**<50**	**<50**	**<100**	<100	**<100**	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH17		0	BH17-0.00	5/06/2020	724546	6.5	<20	<20	<50	**<50**	**<100**	<100	**<100**	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH17		0.45	BH17-0.45	5/06/2020	724546	9.1	**45**	43	1200	1200	**990**	**<100**	2190	<20	740	1500	<50	2240	<0.1	0.3	0.1	1.1	0.7	1.8	<0.5
BH17		0.65	BH17-0.65	5/06/2020	726580	10	**<20**	<20	**95**	95	**120**	**<100**	215	<20	55	150	<50	215	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH17		2.4	BH17-2.4	5/06/2020	726580	9.2	**<20**	<20	**140**	140	160	**<100**	300	<20	77	220	<50	297	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
BH17		3.4	BH17-3.4	5/06/2020	726580	13	**<20**	**<20**	**<50**	**<50**	**<100**	<100	<100	<20	<20	100	<50	100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
NON DESTRUCTIVE TEST PIT SAMPLES																									
NDTP01		0.5	NDTP01_0.5	10/06/2020	725276	10	**<20**	**<20**	<50	**<50**	**<100**	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
NDTP02		0.5	NDTP02_0.5	10/06/2020	725276	7.9	**<20**	**<20**	<50	**<50**	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
NDTP03		0.5	NDTP03_0.5	10/06/2020	725276	**7.4**	<20	**<20**	<50	**<50**	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
NDTP04		0.6	NDTP04_0.6	10/06/2020	725276	**2.4**	<20	**<20**	<50	**<50**	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
NDTP05		0.2	NDTP05_0.2	10/06/2020	725276	**4.9**	<200	**<200**	17000	17000	15000	<500	32000	<200	11000	23000	<250	34000	<1	2.3	<1	11	7.4	18	<10
NDTP06		0.35	NDTP06_0.35	10/06/2020	725276	**7.1**	<20	**<20**	<50	<50	<100	<100	<100	<20	<20	<50	64	64	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
NDTP07			NDTP07	16/07/2020	732705	**7.3**	700	590	31000	30997.5	20000	<100	51000	270	19000	33000	96	52096	<0.4	18	11	53	33	86	2.5
NDTP08			NDTP08	16/07/2020	732705	11	**<20**	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
NDTP09			NDTP09	16/07/2020	**732705**	6.0	**270**	250	14000	14000	10000	510	24510	97	8400	16000	200	24600	<0.5	3	2	11	6.5	17	<2.5
NDTP10			NDTP10	16/07/2020	**732705**	3.2	**<20**	**<20**	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TEST PIT SAMPLES																									
TP05		1	TP05-1.00	3/06/2020	724546	30	**<20**	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP07		1.2	TP07-1.20	3/06/2020	724546	46	**<20**	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP08		1.7	TP08-1.70	3/06/2020	724546	**19**	**<20**	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP09		0	TP09-0.00	3/06/2020	724546	**9**	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP10		0.25	TP10-0.25	5/06/2020	724546	**2.7**	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP11		0.35	TP11_0.35	10/06/2020	725276	**9**	110	100	7200	7199	7800	730	15730	<40	4600	10000	1000	15600	<0.2	<0.2	<0.2	3.2	2.2	5.4	1.5
TP11		0.8	TP11_0.80	10/06/2020	725276	**11**	<20	<20	90	90	120	<100	210	<20	47	150	<50	197	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP12		0	TP12_0.0	10/06/2020	725276	<1	<20	<20	<50	<50	170	250	420	<20	<20	86	170	256	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP12		0.6	TP12_0.6	10/06/2020	725276	11	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP14		0	TP14_0.0	10/06/2020	726613	1.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP14		0.4	TP14_0.4	10/06/2020	726613	10	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP15		0.3	TP15_0.3	10/06/2020	725276	8.2	<20	<20	610	610	1900	240	2750	<20	210	2000	440	2650	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP17		0.15	TP17_0.15	10/06/2020	726613	8.8	<20	<20	12	120	370	<100	490	<20	<20	480	<50	480	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP18		0	TP18_0.0	10/06/2020	725276	2.3	<20	<20	550	550	1600	<100	2150	<20	170	2000	<50	2170	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP18		0.1	TP18_0.1	10/06/2020	725276	5.5	<20	<20	360	360	1100	<100	1460	<20	110	1400	<50	1510	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP19		0.35	TP19_0.35	10/06/2020	725276	15	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP20		0.9	TP20_0.9	10/06/2020	725276	8.7	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP21		0.35	TP21_0.35	10/06/2020	725276	6	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP22		0.35	TP22_0.35	10/06/2020	725276	8.2	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP24		0.3	TP24_0.3	10/06/2020	725276	6.9	<20	<20	<50	<50	1000	490	1490	<20	<20	440	870	1310	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP26		0.35	TP26_0.35	10/06/2020	725276	5.4	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP27		0.35	TP27_0.35	10/06/2020	725276	2.7	<20	<20	600	600	570	<100	1170	<20	340	860	<50	1200	<0.1	<0.1	<0.1	0.2	0.2	0.4	<0.5
TP27A		0.35	TP27A_0.35	11/06/2020	725527	6.7	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP27A		0.45	TP27A_0.45	11/06/2020	725527	8.8	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP28		0.45	TP28_0.45	10/06/2020	725276	10	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP29		0.35	TP29_0.35	10/06/2020	725276	7.8	<200	<200	8000	8000	8000	<500	16000	<200	4900	12000	<250	16900	<1	<1	<1	<2	<1	<3	<5
TP29		1	TP29_1.0	10/06/2020	725276	10	<20	<20	<50	<50	<100	<100	<100	<20	25	75	<50	100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP30		0.6	TP30_0.6	19/06/2020	727254	12	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP31		0	TP31_0.0	19/06/2020	727254	<1	<20	<20	<50	<50	720	<100	720	<20	<20	840	<50	840	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP34		0.35	TP34_0.35	16/07/2020	732705	4.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	67	<50	67	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP35		1.05	TP35_1.05	24/08/2020	740295	11	30	30	3700	3700	4800	<100	8500	<20	2000	6000	<50	8000	<0.1	<0.1	<0.1	0.2	0.3	0.5	<0.5
TP36		1	TP36_1.0	26/08/2020	740295	11	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP36		1.5	TP36_1.5	26/08/2020	740295	11	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
TP37		1.6	TP37_1.6	26/08/2020	740295	11	91	86	3400	3400	3400	<100	6800	23	2200	4200	<50	6400	<0.1	0.7	0.2	2	1.8	4.4	<0.5

						Inorganic	TRH						TPH					BTEXN						
						Moisture Content (dried @ 103°C)	C6-C10	C6-C10 - BTEX (F1)	TRH >C10-C16	C10-C16 - Naphth (F2)	TRH >C16-C34	TRH >C34-C40	C10 - C40 (Sum of)	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of)	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene Total	Naphthalene
						%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				LOR		1	20	20	50	50	100	100	100	20	20	50	50	50	0.1	0.1	0.1	0.2	0.1	0.3	0.5
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																								
0-1m								260		NL									3	NL	NL			230	NL
1-2m								370		NL									3	NL	NL			NL	NL
2-4m								630		NL									3	NL	NL			NL	NL
>4m								NL		NL									3	NL	NL			NL	NL
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil								215		170	1700	3300							75	165	135			180	370
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil							700		1000		3500	10000													
MONITORING WELL INSTALLATION SOIL SAMPLES																									
MW01		3	MW01_3.0	16/07/2020	732705	13	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
MW02		2.2	MW02_2.2	16/07/2020	732705	12	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
MW03		3.4	MW03_3.4	16/07/2020	732705	10	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
MW04		3.5	MW04_3.5	16/07/2020	732705	19	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
VALIDATION SAMPLES																									
V02	Trench b/w Aux & Ramp	0.03	V02_0.03	16/06/2020	726076	6.5	240	220	14000	14000	15000	<100	29000	<200	8100	22000	190	30290	<1	2.4	1.3	8.5	5.6	14	<5
V03	Trench b/w Aux & Ramp	0.03	V03_0.03	16/06/2020	726076	5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
V04	Trench b/w Aux & Ramp	0.03	V04_0.03	16/06/2020	726076	6.4	<200	<200	5500	5500	5200	<100	10700	<200	3600	7800	<50	11400	<1	1.2	<1	4.1	2.6	6.7	<5
V05	Trench b/w Aux & Ramp	0.03	V05_0.03	16/06/2020	726076	7.5	<200	<200	4500	4500	5100	<100	9600	<200	2600	7400	<50	10000	<1	<1	<1	<2	0.7	<3	<5
V06	Trench b/w Aux & Ramp	0.05	V06_0.05	16/06/2020	726076	6.6	<200	<200	5600	5600	7700	<100	13300	**<200**	2900	11000	<50	13900	<1	<1	<1	<2	<0.4	<3	<5
V07	Trench b/w Aux & Ramp	0.06	V07_0.06	16/06/2020	726076	6.3	<20	<20	<50	<50	<100	<100	<100	**<20**	**<20**	<50	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
V08	Trench b/w Aux & Ramp	0.04	V08_0.04	16/06/2020	726076	5.1	<20	<20	<50	<50	<100	<100	<100	**<20**	**<20**	97	<50	97	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
V09	Trench b/w Aux & Ramp	0.04	V09_0.04	16/06/2020	726076	4.5	<20	<20	<50	<50	<100	<100	<100	**<20**	**<20**	90	<50	90	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
V10	Trench b/w Aux & Ramp	0.04	V10_0.04	16/06/2020	726076	4	<20	<20	<50	<50	<100	<100	**<100**	<20	**<20**	**<50**	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
V11	Trench b/w Aux & Ramp	0.03	V11_0.03	16/06/2020	726076	4.3	<20	<20	<50	<50	<100	<100	**<100**	<20	**<20**	**<50**	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
V12	Trench b/w Aux & Ramp	0.025	V12_0.025	16/06/2020	726076	3.5	<200	<200	20000	20000	19000	**<100**	**39000**	<200	**12000**	**29000**	69	41069	<1	1.3	<1	4.4	3.2	7.6	<5
V13	Trench b/w Aux & Ramp	0.05	V13_0.05	16/06/2020	726076	9.1	<20	<20	<50	<50	<100	**<100**	**<100**	**<20**	<20	**<50**	<50	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
V14	1/Aux Road	0.03	V14_0.03	16/06/2020	726076	2.3	<20	<20	480	480	1700	**<100**	**2180**	**<20**	160	**2100**	<50	2260	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
V15	1/Aux Road	0.03	V15_0.03	16/06/2020	726076	1.7	<20	<20	330	330	1400	**<100**	**1730**	**<20**	98	**1700**	<50	1798	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
V16	1/Aux Road	0.03	V16_0.03	16/06/2020	726076	1.6	<20	<20	320	320	1800	**<100**	**2120**	**<20**	**61**	2100	<50	2161	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
V17	1/Aux Road	0.03	V17_0.03	16/06/2020	726076	<1	<20	<20	300	300	**840**	**<100**	**1140**	**<20**	**99**	1100	<50	1199	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
V18	1/Aux Road	0.03	V18_0.03	16/06/2020	726076	2.8	<200	<200	25000	25000	38000	170	**63170**	**<200**	**12000**	53000	420	65420	<1	<1	<1	2.3	1.9	4.2	<5
V19	1/Aux Road	0.03	V19_0.03	16/06/2020	726076	1.7	<200	<200	3500	3500	7700	<100	**11200**	**<200**	**1300**	10000	150	11450	<1	<1	<1	<2	<1	<3	<5
V20	1/Aux Road	0	V20	24/08/2020	740295	1.6	< 20	< 20	**54**	54	**1500**	< 100	**1554**	**< 20**	< 20	1500	< 50	1500	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V21	1/Aux Road	0	V21	24/08/2020	740295	6.8	< 20	< 20	**< 50**	**< 50**	< 100	**< 100**	**< 100**	**< 20**	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V22	1/Aux Road	0	V22	24/08/2020	740295	6.9	< 20	< 20	**< 50**	**< 50**	< 100	**< 100**	**< 100**	**< 20**	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V23	1/Aux Road	0	V23	24/08/2020	740295	5.8	< 20	< 20	**< 50**	**< 50**	< 100	**< 100**	**< 100**	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V24	1/Aux Road	0	V24	24/08/2020	740295	6.6	< 20	< 20	**< 50**	**< 50**	**< 100**	**< 100**	**< 100**	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V25	1/Aux Road	0	V25	24/08/2020	740295	8.3	< 20	< 20	< 50	**< 50**	**< 100**	< 100	**< 100**	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V26	1/Aux Road	0	V26	24/08/2020	740295	7.2	**< 20**	< 20	< 50	**< 50**	**< 100**	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V27	1/Aux Road	0	V27	24/08/2020	740295	7.1	**< 20**	< 20	**< 50**	< 50	**< 100**	**< 100**	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V28	1/Aux Road	0	V28	24/08/2020	740295	7.7	**< 20**	< 20	**160**	160	< 100	**< 100**	160	< 20	23	110	< 50	133	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V29	1/Aux Road	0	V29	24/08/2020	740295	4.4	**< 20**	**< 20**	**< 50**	< 50	220	< 100	220	< 20	< 20	210	< 50	210	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V30	1/Aux Road	0	V30	24/08/2020	740295	1.2	**< 20**	**< 20**	**< 50**	**< 50**	**< 100**	< 100	< 100	< 20	< 20	54	< 50	54	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V57	West Exc - N	1.5	V57	26/08/2020	740295	9.2	**< 20**	**< 20**	< 50	**< 50**	**< 100**	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V60	West Exc - E	1.5	V60	26/08/2020	740295	13	**< 20**	**< 20**	< 50	**< 50**	**< 100**	< 100	< 100	< 20	< 20	73	< 50	73	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V63	West Exc - B	1.75	V63	26/08/2020	740295	**11**	< 20	**< 20**	180	180	< 100	< 100	180	< 20	31	100	< 50	131	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V64	West Exc - S	1.5	V64	26/08/2020	740295	**11**	< 20	**< 20**	< 50	**< 50**	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V65	West Exc - S	0.75	V65	26/08/2020	740295	**10**	< 20	**< 20**	< 50	**< 50**	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V66	West Exc - S	0	V66	26/08/2020	740295	**4.4**	< 20	**< 20**	**150**	150	280	< 100	430	< 20	67	360	< 50	427	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V67	West Exc - W	1.5	V67	26/08/2020	740295	**10**	< 20	**< 20**	**< 50**	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V68	West Exc - W	0.75	V68	26/08/2020	740295	**9.6**	< 20	**< 20**	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V69	West Exc - W	0	V69	26/08/2020	740295	8.4	**< 20**	**< 20**	< 50	< 50	140	< 100	140	< 20	< 20	130	< 50	130	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V70	West Exc - B	2	V70	26/08/2020	**740295**	13	**< 20**	**< 20**	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V71	East Exc - W	1.5	V71	26/08/2020	**740295**	**13**	**< 20**	**< 20**	160	160	< 100	< 100	160	< 20	50	88	< 50	138	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V72	East Exc - W	0.75	V72	26/08/2020	**740295**	13	**300**	290	5700	5700	6000	< 100	11700	64	3800	7100	72	10900	< 0.1	0.9	0.2	4	2	6	< 0.5
V73	East Exc - W	0	V73	26/08/2020	740295	9.5	**< 20**	**< 20**	270	270	330	< 100	600	< 20	150	420	< 50	570	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V74	East Exc - S	1.5	V74	26/08/**2020**	740295	**11**	**< 20**	< 20	410	410	470	< 100	880	< 20	240	590	< 50	830	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V77	East Exc - B	2	V77	26/**08/2020**	**740295**	**12**	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	63	< 50	63	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V78	East Exc - E	1.5	V78	**26/08/2020**	**740295**	**10**	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V79	East Exc - E	0.75	V79	**26/08/2020**	**740295**	**8.5**	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V80	East Exc - E	0	V80	26/**08/2020**	**740295**	**8.1**	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V81	East Exc - N	1.75	V81	26/08/**2020**	**740295**	**11**	37	36	1200	1200	1000	< 100	2200	< 20	830	1300	< 50	2130	< 0.1	< 0.1	< 0.1	0.5	0.4	0.8	< 0.5
V84	East Exc - B	2.0	V84	26/08/**2020**	**740295**	12	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V85	West Exc - W	1.0	V85	22/09/2020	**745838**	11	< 20	< 20	340	340	420	< 100	760	< 20	130	580	<50	710	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V86	West Exc - W	2.0	V86	22/09/2020	**745**838	12	< 20	< 20	820	820	680	< 100	1500	< 20	400	1000	<50	1400	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V87	West Exc - S	1.0	V87	22/09/2020	745838	11	< 20	< 20	<50	<50	< 100	< 100	< 100	< 20	< 20	<50	<50	<50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V88	West Exc - S	2.0	V88	22/09/2020	745838	12	< 20	< 20	<50	<50	< 100	< 100	< 100	< 20	< 20	<50	<50	<50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V89	West Exc - S	1.0	V89	22/09/2020	745838	13	< 20	< 20	1000	1000	1200	< 100	2200	< 20	400	1700	< 50	2100	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V90	West Exc - S	2.0	V90	22/09/2020	745838	15	< 20	< 20	270	270	300	< 100	570	< 20	110	430	< 50	540	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V91	West Exc - S	1.0	V91	22/09/2020	745838	6.1	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V92	West Exc - S	2.0	V92	22/09/2020	745838	10	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	73	< 50	73	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V93	West Exc - S	1.0	V93	22/09/2020	745838	13	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V94	West Exc - S	2.0	V94	22/09/2020	745838	13	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V95	West Exc - S	1.0	V95	22/09/2020	745838	13	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V96	West Exc - S	2.0	V96	22/09/2020	745838	14	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V97	West Exc - E	1.0	V97	22/09/2020	745838	11	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V98	West Exc - E	2.0	V98	22/09/2020	745838	19	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V99	West Exc - N	1.0	V99	22/09/2020	745838	13	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V100	West Exc - N	2.0	V100	22/09/2020	745838	13	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V101	West Exc - N	1.0	V101	22/09/2020	745838	12	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V102	West Exc - N	2.0	V102	22/09/2020	745838	13	< 20	< 20	240	240	230	< 100	470	< 20	140	330	< 50	470	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V103	West Exc - N	1.0	V103	22/09/2020	745838	1.5	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V104	West Exc - N	2.0	V104	22/09/2020	745838	12	< 20	< 20	200	200	280	< 100	480	< 20	89	370	< 50	459	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V105	West Exc - N	1.0	V105	22/09/2020	745838	6.5	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V106	West Exc - N	2.0	V106	22/09/2020	745838	12	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	80	< 50	80	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V107	West Exc - N	1.0	V107	22/09/2020	745838	12	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V108	West Exc - N	2.0	V108	22/09/2020	745838	14	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V109	West Exc - B	2.0	V109	22/09/2020	745838	13	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	87	< 50	87	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V110	West Exc - B	2.0	V110	22/09/2020	745838	18	28	28	1800	1800	1800	< 100	3600	< 20	1100	2500	< 50	3600	< 0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.3	< 0.5
V111	West Exc - B	2.0	V111	22/09/2020	745838	8.4	280	270	11000	10997.6	11000	< 100	22000	56	6700	15000	< 50	21700	< 0.1	< 0.1	< 0.1	7.6	5.1	13	2.4
V112	West Exc - B	2.0	V112	22/09/2020	745838	15	25	25	1200	1200	1600	< 100	2800	< 20	630	2200	< 50	2830	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V113	West Exc - B	2.0	V113	22/09/2020	745838	15	< 20	< 20	440	440	500	< 100	940	< 20	240	700	< 50	940	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V114	West Exc - B	2.0	V114	22/09/2020	745838	17	< 20	< 20	1800	1800	6900	< 100	8700	< 20	390	8000	< 50	8390	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V115	West Exc - B	2.0	V115	22/09/2020	745838	13	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5

						Inorganic	TRH						TPH					BTEXN						
						Moisture Content (dried @ 103°C)	C6-C10	C6-C10 - BTEX (F1)	TRH >C10-C16	C10-C16 - Napth (F2)	TRH >C16-C34	TRH >C34-C40	C10 - C40 (Sum of)	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of)	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene Total	Naphthalene
						%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
					LOR	1	20	20	50	50	100	100	100	20	20	50	50	50	0.1	0.1	0.1	0.2	0.1	0.3	0.5
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																									
0-1 m								260		NL									3	NL	NL			230	NL
1-2 m								370		NL									3	NL	NL			NL	NL
2-4 m								630		NL									3	NL	NL			NL	NL
>4m								NL		NL									3	NL	NL			NL	NL
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil								215		170	1700	3300							75	165	135			180	370
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil							700		1000		3500	10000													
V116	Trench b/w Aux & Ramp	0	V116	1/10/2020	747984	14	< 20	< 20	170	170	690	100	960	**< 20**	**75**	740	67	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V117	Trench b/w Aux & Ramp	0	V117	1/10/2020	747984	12	< 20	< 20	< 50	< 50	200	110	310	**< 20**	**22**	170	69	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V118	Trench b/w Aux & Ramp	0	V118	1/10/2020	747984	18	< 20	< 20	< 50	< 50	330	350	**680**	**< 20**	**<20**	220	210	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V119	Trench b/w Aux & Ramp	0	V119	1/10/2020	747984	13	< 20	< 20	590	590	2000	140	**2730**	< 20	**200**	**2300**	90	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V120	Trench b/w Aux & Ramp	0	V120	1/10/2020	747984	11	< 20	< 20	< 50	< 50	< 100	**< 100**	**< 100**	< 20	**< 20**	**< 50**	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V121	Trench b/w Aux & Ramp	0	V121	1/10/2020	747984	6.9	< 20	< 20	< 50	< 50	390	**510**	**900**	**< 20**	**< 20**	**230**	310	540	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V122	Trench b/w Aux & Ramp	0	V122	1/10/2020	747984	11	<20	<20	4100	4100	6600	**1100**	**11800**	**<20**	1800	**8600**	430	10830	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V123	Trench b/w Aux & Ramp	0	V123	1/10/2020	747984	7	< 20	< 20	< 50	< 50	210	**440**	**650**	**<20**	<20	**79**	230	309	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V124	Trench b/w Aux & Ramp	0	V124	1/10/2020	747984	15	< 20	< 20	< 50	< 50	**230**	**520**	**750**	**<20**	**<20**	**79**	270	349	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V125	Trench b/w Aux & Ramp	0	V125	1/10/2020	747984	15	< 20	< 20	< 50	< 50	**630**	**270**	**900**	**<20**	**<20**	560	150	710	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V126	Trench b/w Aux & Ramp	0	V126	1/10/2020	747984	11	< 20	< 20	< 50	< 50	**< 100**	**< 100**	**< 100**	**<20**	**<20**	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V127	S of Ramp Rd	0.1	V127	1/10/2020	747984	6.8	< 20	< 20	< 50	< 50	**< 100**	**< 100**	**< 100**	**<20**	**<20**	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V128	S of Ramp Rd	0	V128	1/10/2020	747984	<1	<20	<20	**< 50**	**< 50**	**< 100**	**< 100**	**< 100**	**<20**	<20	54	60	114	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V129	S of Ramp Rd	0	V129	1/10/2020	747984	<1	<20	<20	**< 50**	**< 50**	**<100**	**120**	**120**	**<20**	<20	<50	72	72	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V130	S of Ramp Rd	0	V130	1/10/2020	747984	1.3	<20	<20	**< 50**	**< 50**	<100	**160**	**160**	**<20**	<20	<50	95	95	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V131	S of Ramp Rd	0	V131	1/10/2020	747984	1.9	<20	<20	**< 50**	**< 50**	<100	**170**	**170**	<20	<20	52	94	146	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V132	S of Ramp Rd	0	V132	1/10/2020	747984	<1	<20	<20	**< 50**	**< 50**	130	**180**	**310**	<20	<20	85	110	195	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V133	S of Ramp Rd	0	V133	1/10/2020	747984	6.9	<20	<20	**< 50**	**< 50**	**<100**	100	**100**	<20	<20	<50	71	71	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V134	S of Ramp Rd	0.5	V134	1/10/2020	747984	2.7	<20	<20	< 50	**< 50**	**100**	190	**290**	<20	<20	<50	120	120	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V135	S of Ramp Rd	0.5	V135	1/10/2020	747984	3.3	**<20**	<20	**< 50**	< 50	**<100**	200	200	<20	<20	<50	110	110	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V136	S of Ramp Rd	0.5	V136	1/10/2020	747984	10	**<20**	<20	**< 50**	< 50	130	**120**	120	<20	<20	<50	54	54	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V137	S of Ramp Rd	0.5	V137	1/10/2020	747984	7.2	**<20**	<20	**< 50**	< 50	<100	**160**	160	<20	<20	<50	80	80	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V138	S of Ramp Rd	0.5	V138	1/10/2020	747984	6.4	**<20**	**<20**	**< 50**	**< 50**	100	160	160	<20	<20	<50	79	79	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V139	S of Ramp Rd	0.5	V139	1/10/2020	747984	**6.1**	**<20**	**<20**	**< 50**	**< 50**	**<100**	160	160	<20	<20	<50	84	84	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V140	S of Ramp Rd	0.5	V140	1/10/2020	747984	4.8	**< 20**	**< 20**	< 50	**< 50**	**< 100**	130	130	<20	<20	< 50	65	65	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V141	S of Ramp Rd	0.5	V141	1/10/2020	747984	9.3	**< 20**	**< 20**	< 50	**< 50**	< 100	< 100	< 100	<20	<20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V142	S of Ramp Rd	0.2	V142	1/10/2020	747984	**8**	< 20	**< 20**	< 50	**< 50**	< 100	< 100	< 100	<20	<20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V143	S of Ramp Rd	0.2	V143	1/10/2020	747984	**11**	< 20	**< 20**	< 50	**< 50**	< 100	< 100	< 100	<20	<20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V144	S of Ramp Rd	0.2	V144	1/10/2020	747984	**9.4**	< 20	**< 20**	< 50	**< 50**	< 100	< 100	< 100	<20	<20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V145	S of Ramp Rd	0.2	V145	1/10/2020	747984	**5.6**	180	**170**	16000	15999.1	13000	510	29510	45	8400	19000	480	27880	< 0.1	0.3	< 0.1	5.5	4.5	10	0.9
V146	S of Ramp Rd	0.2	V146	1/10/2020	747984	**6.9**	240	220	17000	16999	17000	820	34820	72	11000	23000	770	34770	< 0.1	0.2	< 0.1	9	7.6	17	1
V147	S of Ramp Rd	0.2	V147	1/10/2020	**747**984	**9.2**	**< 20**	< 20	< 50	< 50	< 100	< 100	< 100	<20	<20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V148	S of Ramp Rd	0.5	V148	1/10/2020	**747984**	14	**< 20**	**< 20**	< 50	< 50	110	< 100	110	< 20	< 20	120	< 50	120	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V149	S of Ramp Rd	0	V149	1/10/20**20**	**747984**	11	**< 20**	**< 20**	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V150	S of Ramp Rd	0	V150	1/10/2020	**747984**	8.7	**< 20**	**< 20**	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V151	S of Ramp Rd	0	V151	1/10/2020	747984	11	**< 20**	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V152	S of Ramp Rd	0	V152	1/10/**20**20	747984	11	**< 20**	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V153	S of Ramp Rd	0	V153	1/10/**20**20	747984	**8.4**	**< 20**	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V154	S of Ramp Rd	0	V154	**1/10/2020**	**747984**	**9.3**	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V155	S of Ramp Rd	0.5	V155	**1/10/2020**	**747984**	**13**	< 20	< 20	< 50	< 50	140	< 100	140	< 20	< 20	150	< 50	150	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V156	S of Ramp Rd	0.5	V156	**1/10/2020**	**747984**	**9.7**	< 20	< 20	1400	1400	7600	4900	13900	< 20	620	5000	5100	10720	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V157	S of Ramp Rd	0.5	V157	1/10/**2020**	**747984**	**4.6**	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V158	S of Ramp Rd	0.5	V158	1/10/**2020**	**747984**	11	< 20	< 20	2900	2900	4400	990	8290	< 20	1500	5200	900	7600	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V159	S of Ramp Rd	0.5	V159	1/10/**2020**	**747984**	9.5	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	21	90	< 50	111	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V160	S of Ramp Rd	0.5	V160	1/10/**2020**	**747984**	9.8	< 20	< 20	240	240	640	< 100	880	< 20	100	770	< 50	870	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V161	S of Ramp Rd	0.1	V161	1/10/2020	**747**984	6.2	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V162	S of Ramp Rd	0.1	V162	1/10/2020	747984	3.5	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V163	S of Ramp Rd	0.1	V163	1/10/2020	747984	6	< 20	< 20	< 50	< 50	< 100	100	100	< 20	< 20	< 50	60	60	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V164	S of Ramp Rd	0.1	V164	1/10/2020	747984	5.1	< 20	< 20	< 50	< 50	< 100	120	120	< 20	< 20	< 50	70	70	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V165	S of Ramp Rd	0.1	V165	1/10/2020	747984	5.5	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V166	S of Ramp Rd	0.1	V166	1/10/2020	747984	4.5	< 20	< 20	< 50	< 50	120	130	250	< 20	< 20	81	75	156	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V167	S of Ramp Rd	0.1	V167	1/10/2020	747984	11	20	< 20	5300	5300	7500	4700	17500	< 20	3200	7600	3800	14600	< 0.1	< 0.1	< 0.1	< 0.2	0.2	< 0.3	< 0.5
V168	S of Ramp Rd	0.1	V168	1/10/2020	747984	5	< 20	< 20	< 50	< 50	< 100	220	220	< 20	< 20	< 50	120	120	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V169	S of Ramp Rd	0.1	V169	1/10/2020	747984	5.5	< 20	< 20	< 50	< 50	< 100	170	170	< 20	< 20	< 50	93	93	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V170	S of Ramp Rd	0.1	V170	1/10/2020	747984	5.2	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	58	58	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V171	S of Ramp Rd	0.1	V171	1/10/2020	747984	4.9	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V172	S of Ramp Rd	0.1	V172	1/10/2020	747984	6	< 20	< 20	< 50	< 50	< 100	130	130	< 20	< 20	< 50	76	76	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V173	S of Ramp Rd	0.1	V173	1/10/2020	747984	5.8	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V174	S of Ramp Rd	0.1	V174	1/10/2020	747984	6	< 20	< 20	< 50	< 50	< 100	< 100	< 100	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V175	S of Ramp Rd	0.1	V175	12/10/2020	749730	6.8	< 20	< 20	< 50	< 50	150	310	460	< 20	< 20	< 50	180	180	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V176	S of Ramp Rd	0.1	V176	12/10/2020	749730	4.3	< 20	< 20	< 50	< 50	190	350	540	< 20	< 20	80	210	290	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V177	S of Ramp Rd	0.1	V177	12/10/2020	749730	7.9	< 20	< 20	< 50	< 50	120	230	350	< 20	< 20	60	120	180	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5
V178	S of Ramp Rd	0.1	V178	12/10/2020	749730	6.2	< 20	< 20	< 50	< 50	170	320	490	< 20	< 20	67	190	257	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.3	< 0.5

			Inorganic	TRH							TPH					BTEXN						
			Moisture Content (dried @ 103°C)	C6-C10	F1 (C6-C10) minus BTEX	TRH >C10-C16	F2 (C10-C16) minus Napth	TRH >C16-C34	TRH >C34-C40	C10 - C40 (Sum of total)	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene Total	Naphthalene
			%	mg/kg	mg/kg	MG/KG	mg/kg	MG/KG	MG/KG	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR			1	20	20	50	50	100	100	100	20	20	50	50	50	0.1	0.1	0.1	0.2	0.1	0.3	0.5
NSW OEH Waste Classification Guidelines - General Solid Waste											≤650				≤10000	≤10	≤600	≤288			≤1000	
NSW OEH Waste Classification Guidelines - Restricted Solid Waste											>650 ≤2600				>10000 ≤40000	>10 ≤40	>600 ≤2400	>288 ≤1512			>1000 ≤4000	
NSW OEH Waste Classification Guidelines - Restricted Solid Waste											>2600				>40000	>40	>2400	>1512			>4000	
Field_ID	Sample Date	Lab Report Number																				
SP01	11/06/2020	725276	5.1	<200	<200	26,000	26,000	23,000	<1000	49,000	<200	16,000	36,000	<500	52,000	<1	2	<1	7.1	4.8	12	<10
SP02	11/06/2020	725276	2.2	<200	<200	24,000	24,000	28,000	<1000	52,000	<200	13,000	41,000	<500	54,000	<1	<1	<1	3.3	2.1	5.4	<10
SP03	11/06/2020	725276	3.3	<200	<200	26,000	26,000	24,000	<1000	50,000	<200	16,000	36,000	<500	52,000	<1	2.9	<1	10	6.5	16	<10
SP04	11/06/2020	725276	3.7	<400	<400	16,000	16,000	16,000	<500	32,000	<400	8800	24,000	<250	32,800	<2	<2	<2	<4	<2	<6	<10
SP05	11/06/2020	725276	2	<400	<400	9900	9900	11,000	<500	20,900	<400	5500	16,000	<250	21,500	<2	<2	<2	<4	<2	<6	<10
SP06	11/06/2020	725276	2.9	460	450	27,000	27,000	25,000	<1000	52,000	<400	16,000	38,000	<500	54,000	<2	<2	<2	5.7	4.2	9.9	<10
SP07	11/06/2020	725276	2.2	<400	<400	16,000	16,000	19,000	<500	35,000	<400	8100	28,000	<250	36,100	<2	<2	<2	<4	3.2	<6	<10
SP08	11/06/2020	725276	5.1	<100	<100	7800	7800	8200	<500	16,000	<100	4400	12,000	<250	16,400	<0.5	<0.5	<0.5	<1	0.8	<1.5	<2.5
SP09	11/06/2020	725276	4.3	<100	<100	4300	4300	5000	<500	9300	<100	2400	7200	<250	9600	<0.5	<0.5	<0.5	<1	0.6	<1.5	<2.5
SP10	11/06/2020	725276	4.3	<100	<100	4200	4200	4400	<500	8600	<100	2400	6500	<250	8900	<0.5	<0.5	<0.5	<1	<0.5	<1.5	<2.5
SP-01	18/06/2020	727254	3.8	<20	<20	91	91	240	<100	331	<20	33	330	<50	363	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
SP-02	18/06/2020	727254	3.8	34	33	1400	1400	2700	<100	4100	<20	490	3800	<50	4290	<0.1	<0.1	<0.1	0.4	0.4	0.9	<0.5
SP-04	18/06/2020	727254	3.9	<20	<20	4200	4200	4700	<100	8900	<20	2100	7000	<50	9100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5
SP-05	18/06/2020	727254	3.5	<20	<20	4000	4000	5000	<100	9000	<20	1800	7400	<50	9200	<0.1	<0.1	<0.1	<0.2	0.1	<0.3	<0.5
SP-06	18/06/2020	727254	4.9	<20	<20	2600	2600	3400	<100	6000	<20	1200	5000	<50	6200	<0.1	<0.1	<0.1	<0.2	0.1	<0.3	<0.5
SP-07	18/06/2020	727254	4.9	<20	<20	2300	2300	2900	<100	5200	<20	1100	4200	<50	5300	<0.1	<0.1	<0.1	<0.2	0.1	<0.3	<0.5
SP-08	18/06/2020	727254	5.9	<20	<20	2400	2400	3100	<100	5500	<20	1100	4500	<50	5600	<0.1	<0.1	<0.1	<0.2	0.1	<0.3	<0.5
SP-09	18/06/2020	727254	5.3	22	21	4900	4900	5600	<100	10500	<20	2400	8200	<50	10600	<0.1	<0.1	<0.1	0.3	0.3	0.6	<0.5
SP-10	18/06/2020	727254	5.9	25	24	3600	3600	4400	<100	8000	<20	1700	6400	<50	8100	<0.1	<0.1	<0.1	0.3	0.3	0.6	<0.5
SP-11	18/06/2020	727254	5.5	<20	<20	5800	5799.3	6500	<100	12300	<20	2900	9600	<50	12500	<0.1	<0.1	<0.1	<0.2	0.2	0.4	0.7
SP-12	18/06/2020	727254	4.1	87	81	14000	13999.2	14000	<100	28000	24	7100	21000	<50	28100	<0.1	0.5	0.3	3.1	2.4	5.4	0.8

DRAFT

Sample Id	Analyte
SP01	
SP02	
SP03	
SP04	
SP05	
SP06	
SP07	
SP08	
SP09	
SP10	
SP-01	363
SP-02	4290
SP-04	9100
SP-05	9200
SP-06	6200
SP-07	5300
SP-08	5600
SP-09	10600
SP-10	8100
SP-11	12500
SP-12	28100
Average	9032.09
Minimum	363.00
Maximum	28100.00
Std **Deviation**	7143.81
Count	11.00
5% Confidence	4221.65
95% Confidence	13253.74
COVAR	**0.79**
tα, n-1 (pp 23	**1.812**
Sampling Design	**Guidleines, α=0.05)**
95% UCL	**12936.02424**

DRAFT

Test Location	Depth (m bgl)	Contaminant in Soil Sample (mg/kg)						Leached Contaminant (mg/L)						Leached Contaminant:Contaminant in Leachate Fluid "Solution" (%)					
		TRH C_6-C_{10} (F1)	TRH >C_{10}-C_{16} (F2)	TRH >C_{16}-C_{34} (F3)	TRH C_{10}-C_{40}	Toluene	o-Xylene	TRH C_6-C_{10} (F1)	TRH >C_{10}-C_{16} (F2)	TRH >C_{16}-C_{34} (F3)	TRH C_{10}-C_{40}	Toluene	o-Xylene	TRH C_6-C_{10} (F1)	TRH >C_{10}-C_{16} (F2)	TRH >C_{16}-C_{34} (F3)	TRH C_{10}-C_{40}	Toluene	o-Xylene
Marine Water 99% species protection trigger value (ANZECC 2018)		-	-	-	-	-	-	-	-	-	-	**0.11**	-	-	-	-	-	-	-
BH15	0.02	440	27,000	23,000	50,000	2.6	11.0	<1	0.77	0.8	1.57	0.04	0.04	<4.55	0.06	0.07	0.06	37.69	7.27
TP11	0.35	100	71,999	7,800	15,730	<0.2	2	<1	0.41	0.2	0.61	<0.02	<0.02	<20	0.11	0.05	0.08	N/A	<1.83
TP29	0.35	<200	8,000	8,000	16,000	<1	<1	<1	1.2	1	2.2	<0.02	<0.02	N/A	0.3	0.25	0.28	N/A	N/A
													Mean	-	0.157	0.124	0.139	-	-

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			Lab Report Number	724546	724546		724546	ES2020384		724546	724546		724546	ES2020384		725276	725276		725276	ES2019730	
			Field ID	BH03-2.00	QA05	RPD	BH03-2.00	QA06	RPD	BH08A-3.50	QA07	RPD	BH08A-3.50	QA08	RPD	TP15_0.3	QA13	RPD	TP15_0.3	QA14	RPD
			Sampled Date/Time	4/06/2020	4/06/2020		4/06/2020	4/06/2020		4/06/2020	4/06/2020		4/06/2020	5/06/2020		10/06/2020	10/06/2020		10/06/2020	10/06/2020	
Method_T	ChemName	Units	EQL																		
Volatile	Benzene	mg/kg	0.1 (Primary): 0.2 (Interlab)	<0.1	<0.1	0	<0.1	<0.2	0	<0.1	<0.1	0	<0.1	<0.2	0	<0.1	<0.1	0	<0.1	<0.2	0
	Ethylbenzene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0
	Toluene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0
	Xylene (m & p)	mg/kg	0.2 (Primary): 0.5 (Interlab)	<0.2	<0.2	0	<0.2	<0.5	0	<0.2	<0.2	0	<0.2	<0.5	0	<0.2	<0.2	0	<0.2	<0.5	0
	Xylene (o)	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0
	Xylene Total	mg/kg	0.3 (Primary): 0.5 (Interlab)	<0.3	<0.3	0	<0.3	<0.5	0	<0.3	<0.3	0	<0.3	<0.5	0	<0.3	<0.3	0	<0.3	<0.5	0
Inorganic	Moisture Content (dried @ 103°C)	%	1	6.8	7.4	8	6.8	6.3	8	18.0	19.0	5	18.0	19.2	6	8.2	7.6	8	8.2	9.6	16
Organic	TRH >C10-C16	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	610.0	370.0	49	610.0	620.0	2
	TRH >C16-C34	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	1900.0	1100.0	53	1900.0	1620.0	16
	TRH >C34-C40	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	240.0	130.0	59	240.0	230.0	4
	Naphthalene	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<1.0	0	<0.5	<0.5	0	<0.5	<1.0	0	<0.5	<0.5	0	<0.5	<1.0	0
	F1 minus BTEX (C6-C10)	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0
	F2-Napth (C10-C16)	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	610.0	370.0	49	610.0	620.0	2
	C6 - C9	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0
	C10 - C40 (Sum of total)	mg/kg	100 (Primary): 50 (Interlab)	<100.0	<100.0	0	<100.0	<50.0	0	<100.0	<100.0	0	<100.0	<50.0	0	2750.0	1600.0	53	2750.0	2470.0	11
	C6-C10	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0
TPH	C10 - C14	mg/kg	20 (Primary): 50 (Interlab)	<20.0	<20.0	0	<20.0	<50.0	0	<20.0	<20.0	0	<20.0	<50.0	0	210.0	130.0	47	210.0	210.0	0
	C15 - C28	mg/kg	50 (Primary): 100 (Interlab)	<50.0	<50.0	0	<50.0	<100.0	0	<50.0	<50.0	0	<50.0	<100.0	0	2000.0	1200.0	50	2000.0	1740.0	14
	C29-C36	mg/kg	50 (Primary): 100 (Interlab)	<50.0	<50.0	0	<50.0	<100.0	0	<50.0	<50.0	0	<50.0	<100.0	0	440.0	260.0	51	440.0	360.0	20
	+C10 - C36 (Sum of total)	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	2650.0	1590.0	50	2650.0	2310.0	14

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		Lab Report Number	725276	725276		725276	ES2019730		725276	725276		725276	ES2019730		726076	726076		732705	732705		732705	ES2024223	
		Field ID	TP22_0.35	QA15	RPD	TP22_0.35	QA16	RPD	SP01	QA19	RPD	SP01	QA20	RPD	V18_0.03	VQA01	RPD	MW01_3.0	QA07	RPD	MW01_3.0	QA08	RPD
		Sampled Date/Time	10/06/2020	10/06/2020		11/06/2020	11/06/2020		11/06/2020	11/06/2020		11/06/2020	11/06/2020		16/06/2020	16/06/2020		15/07/2020	15/07/2020		15/07/2020	15/07/2020	
Method_T	**ChemName**	**Units**	**EQL**																				
Volatile	Benzene	mg/kg	0.1 (Primary): 0.2 (Interlab)	<0.1	<0.1	0	<0.1	<0.2	0	<1.0	<1.0	0	<1.0	<0.2	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.2	0
	Ethylbenzene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	2.0	2.0	0	2.0	1.6	22	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0
	Toluene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<1.0	<1.0	0	<1.0	<0.5	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0
	Xylene (m & p)	mg/kg	0.2 (Primary): 0.5 (Interlab)	<0.2	<0.2	0	<0.2	<0.5	0	7.1	6.8	4	7.1	6.0	17	2.3	3.1	30	<0.2	<0.2	0	<0.2	<0.5	0
	Xylene (o)	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	4.8	4.8	0	4.8	4.0	18	1.9	2.6	31	<0.1	<0.1	0	<0.1	<0.5	0
	Xylene Total	mg/kg	0.3 (Primary): 0.5 (Interlab)	<0.3	<0.3	0	<0.3	<0.5	0	12.0	12.0	0	12.0	10.0	18	4.2	5.7	30	<0.3	<0.3	0	<0.3	<0.5	0
Inorganic	Moisture Content (dried @ 103°C)	%	1	8.2	8.7	6	8.2	9.6	16	5.1	6.0	16	5.1	8.2	47	3	2	49	13	12		13	12.3	6
Organic	TRH>C10-C16	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	26000.0	26000.0	0	26000.0	31800.0	20	25000	32000	25	<50.0	<50.0	0	<50.0	<50	0
	TRH>C16-C34	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	23000.0	23000.0	0	23000.0	26900.0	16	38000	44000	15	<100.0	<100.0	0	<100.0	<100	0
	TRH>C34-C40	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	<1000.0	<1000.0	0	<1000.0	<100.0	0	170	50	109	<100.0	<100.0	0	<100.0	<100	0
	Naphthalene	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<1.0	0	<10.0	<10.0	0	<10.0	1.0	0	<5	<5	0	<0.5	<0.5	0	<0.5	<1	0
	F1 minus BTEX (C6-C10)	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10.0	0	<200.0	<200.0	0	<200.0	186.0	0	<200	<200	0	<20.0	<20.0	0	<20.0	<10	0
	F2-Napth (C10-C16)	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	26000.0	26000.0	0	26000.0	31800.0	20	25000	32000	25	<50.0	<50.0	0	<50.0	<50	0
	C6 - C9	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10.0	0	<200.0	<200.0	0	<200.0	66.0	0	<200	<200	0	<20.0	<20.0	0	<20.0	<10	0
	C10 - C40 (Sum of total)	mg/kg	100 (Primary): 50 (Interlab)	<100.0	<100.0	0	<100.0	<50.0	0	49000.0	49000.0	0	49000.0	58700.0	18	63170	76000	18	<100.0	<100.0	0	<100.0	<50	0
	C6-C10	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10.0	0	<200.0	<200.0	0	<200.0	198.0	0	<200	<200	0	<20.0	<20.0	0	<20.0	<10	0
TPH	C10 - C14	mg/kg	20 (Primary): 50 (Interlab)	<20.0	<20.0	0	<20.0	<50.0	0	16000.0	16000.0	0	16000.0	18400.0	14	12000	15000	22	<20.0	<20.0	0	<20.0	<50	0
	C15 - C28	mg/kg	50 (Primary): 100 (Interlab)	<50.0	<50.0	0	<50.0	<100.0	0	36000.0	36000.0	0	36000.0	41600.0	14	53000	64000	19	<50.0	<50.0	0	<50.0	120	0
	C29-C36	mg/kg	50 (Primary): 100 (Interlab)	<50.0	<50.0	0	<50.0	<100.0	0	<500.0	<500.0	0	<500.0	110.0	0	420	230	58	<50.0	<50.0	0	<50.0	<100	0
	+C10 - C36 (Sum of total)	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	52000.0	52000.0	0	52000.0	60100.0	14	65420	79230	19	<50.0	<50.0	0	<50.0	120	0

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			Lab Report Number	740295	740295		740295	ES2030455		740295	740295		740295	ES2030455		740295	740295		740295	ES2030455	
			Field ID	V23	QA01	RPD	V23	QA02	RPD	V80	QA03	RPD	V80	QA04	RPD	V84	QA05	RPD	V84	QA06	RPD
			Sampled Date/Time	24/08/2020	24/08/2020		24/08/2020	24/08/2020		26/08/2020	26/08/2020		26/08/2020	26/08/2020		26/08/2020	26/08/2020		26/08/2020	26/08/2020	
Method_T	ChemName	Units	EQL																		
Volatile	Benzene	mg/kg	0.1 (Primary): 0.2 (Interlab)	<0.1	<0.1	0	<0.1	<0.2	0	<0.1	<0.1	0	<0.1	<0.2	0	<0.1	<0.1	0	<0.1	<0.2	0
	Ethylbenzene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0
	Toluene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0
	Xylene (m & p)	mg/kg	0.2 (Primary): 0.5 (Interlab)	<0.2	<0.2	0	<0.2	<0.5	0	<0.2	<0.2	0	<0.2	<0.5	0	<0.2	<0.2	0	<0.2	<0.5	0
	Xylene (o)	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0
	Xylene Total	mg/kg	0.3 (Primary): 0.5 (Interlab)	<0.3	<0.3	0	<0.3	<0.5	0	<0.3	<0.3	0	<0.3	<0.5	0	<0.3	<0.3	0	<0.3	<0.5	0
Inorganic	Moisture Content (dried @ 103°C)	%	1	5.8	5.8	0	5.8	5.4	7	8.1	8.6	6	8.1	7.4	9	12	12	0	12	10.6	0
Organic	TRH >C10-C16	mg/kg	50	<50.0	<50.0	0	<50.0	<50	0	<50.0	<50.0	0	<50.0	<50	0	<50.0	<50.0	0	<50.0	<50	0
	TRH >C16-C34	mg/kg	100	<100.0	<100.0	0	<100.0	<100	0	<100.0	<100.0	0	<100.0	<100	0	<100.0	<100.0	0	<100.0	<100	0
	TRH >C34-C40	mg/kg	100	<100.0	<100.0	0	<100.0	<100	0	<100.0	<100.0	0	<100.0	<100	0	<100.0	<100.0	0	<100.0	<100	0
	Naphthalene	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<1	0	<0.5	<0.5	0	<0.5	<1	0	<0.5	<0.5	0	<0.5	<1	0
	F1 minus BTEX (C6-C10)	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10	0	<20.0	<20.0	0	<20.0	<10	0	<20.0	<20.0	0	<20.0	<10	0
	F2-Napth (C10-C16)	mg/kg	50	<50.0	<50.0	0	<50.0	<50	0	<50.0	<50.0	0	<50.0	<50	0	<50.0	<50.0	0	<50.0	<50	0
	C6 - C9	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10	0	<20.0	<20.0	0	<20.0	<10	0	<20.0	<20.0	0	<20.0	<10	0
	C10 - C40 (Sum of total)	mg/kg	100 (Primary): 50 (Interlab)	<100.0	<100.0	0	<100.0	<50	0	<100.0	<100.0	0	<100.0	<50	0	<100.0	<100.0	0	<100.0	<50	0
	C6-C10	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10	0	<20.0	<20.0	0	<20.0	<10	0	<20.0	<20.0	0	<20.0	<10	0
TPH	C10 - C14	mg/kg	20 (Primary): 50 (Interlab)	<20.0	<20.0	0	<20.0	<50	0	<20.0	<20.0	0	<20.0	<50	0	<20.0	<20.0	0	<20.0	<50	0
	C15 - C28	mg/kg	50 (Primary): 100 (Interlab)	25	62	85	25	120	131	<50.0	<50.0	0	<50.0	<100	0	<50.0	<50.0	0	<50.0	<100	0
	C29-C36	mg/kg	50 (Primary): 100 (Interlab)	<50.0	<50.0	0	<50.0	<100	0	<50.0	<50.0	0	<50.0	<100	0	<50.0	<50.0	0	<50.0	<100	0
	+C10 - C36 (Sum of total)	mg/kg	50	25	62	85	25	120	131	<50.0	<50.0	0	<50.0	<50	0	<50.0	<50.0	0	<50.0	<50	0

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			Lab Report Number	725276	725276		725276	ES2033271		725276	725276		725276	ES2033271	
			Field ID	V85	QA07	RPD	V85	QA08	RPD	V105	QA09	RPD	V105	QA10	RPD
			Sampled Date/Time	22/09/2020	22/09/2020		22/09/2020	22/09/2020		22/09/2020	22/09/2020		22/09/2020	22/09/2020	
Method_T	ChemName	Units	EQL												
Volatile	Benzene	mg/kg	0.1 (Primary): 0.2 (Interlab)	<0.1	<0.1	0	<0.1	<0.2	0	<0.1	<0.1	0	<0.1	<0.2	0
	Ethylbenzene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0
	Toluene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0
	Xylene (m & p)	mg/kg	0.2 (Primary): 0.5 (Interlab)	<0.2	<0.2	0	<0.2	<0.5	0	<0.2	<0.2	0	<0.2	<0.5	0
	Xylene (o)	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0
	Xylene Total	mg/kg	0.3 (Primary): 0.5 (Interlab)	<0.3	<0.3	0	<0.3	<0.5	0	<0.3	<0.3	0	<0.3	<0.5	0
Inorganic	Moisture Content (dried @ 103°C)	%	1	11	12	9	11	10.9	1	6.5	3.7	55	6.5	2.4	92
Organic	TRH >C10-C16	mg/kg	50	340	87	119	340	510	40	<50.0	<50.0	0	<50.0	<50.0	0
	TRH >C16-C34	mg/kg	100	420	130	105	420	520	21	<100.0	<100.0	0	<100.0	<100.0	0
	TRH >C34-C40	mg/kg	100	<100	<100.0	0	<100	<100	0	<100.0	<100.0	0	<100.0	<100	0
	Naphthalene	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<1	0	<0.5	<0.5	0	<0.5	<0.5	0
	F1 minus BTEX (C6-C10)	mg/kg	20 (Primary): 10 (Interlab)	<20	<20.0	0	<20	<10	0	<20.0	<20.0	0	<20.0	<10	0
	F2-Napth (C10-C16)	mg/kg	50	340	87	119	340	510	40	<50.0	<50.0	0	<50.0	<50	0
	C6 - C9	mg/kg	20 (Primary): 10 (Interlab)	<20	<20.0	0	<20	<10	0	<20.0	<20.0	0	<20.0	<10	0
	C10 - C40 (Sum of total)	mg/kg	100 (Primary): 50 (Interlab)	760	217	111	760	1030	30	<100.0	<100.0	0	<100.0	<50	0
	C6-C10	mg/kg	20 (Primary): 10 (Interlab)	<20	<20.0	0	<20	<10	0	<20.0	<20.0	0	<20.0	<10	0
TPH	C10 - C14	mg/kg	20 (Primary): 50 (Interlab)	130	40	106	130	250	63	<20.0	<20.0	0	<20.0	<50	0
	C15 - C28	mg/kg	50 (Primary): 100 (Interlab)	580	180	105	580	780	29	<50.0	<50.0	0	<50.0	<100	0
	C29-C36	mg/kg	50 (Primary): 100 (Interlab)	<50	<50.0	0	<50	<100	0	<50.0	<50.0	0	<50.0	<100	0
	+C10 - C36 (Sum of total)	mg/kg	50	710	220	105	710	1030	37	<50.0	<50.0	0	<50.0	<50	0

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Trip Blank Results

			Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene Total
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
			1	1	1	2	1	3
Field_ID	**Sampled_Date**	**Lab Report Number**						
TB01	2/06/2020	724546	<1	<1	<1	<2	<1	<3
TB02	3/06/2020	724546	<1	<1	<1	<2	<1	<3
TB03	4/06/2020	724546	<1	<1	<1	<2	<1	<3
TB04	5/06/2020	724546	<1	<1	<1	<2	<1	<3
TB05	10/06/2020	725276	<1	<1	<1	<2	<1	<3
TB06	11/06/2020	725276	<1	<1	<1	<2	<1	<3
TB07	16/06/2020	726076	<1	<1	<1	<2	<1	<3
TB08	18/06/2020	727254	<1	<1	<1	<2	<1	<3
TB	13/07/2020	732705	<1	<1	<1	<2	<1	<3
TB	15/07/2020	732705	<1	<1	<1	<2	<1	<3
TB	16/07/2020	732705	<1	<1	<1	<2	**<1**	**<3**
TB	24/08/2020	740295	<1	<1	<1	<2	**<1**	**<3**
TB	25/08/2020	740295	<1	<1	<1	<2	**<1**	**<3**
TB	26/08/2020	740295	<1	<1	<1	<2	**<1**	**<3**
TB01	22/09/2020	745838	<1	<1	<1	<2	**<1**	<3

Rinsate Blank Results

			TRH							TPH					BTEXN						
			C6-C10	F1 (C6-C10) minus BTEX	TRH >C10-C16	F2-(C10-C16) minus Napth	TRH >C16-C34	TRH >C34-C40	C10 - C40 (Sum of total)	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	Naphthalene	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene Total
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
			20	20	50	50	100	100	100	20	20	50	50	50		1	1	1	2	1	3
Field_ID	**Sampled_Date**	**Lab Report Number**																			
RB01	2/06/2020	725527	<20	<20	<50	<50	<100	<100	<100	<20	<50	<100	<100	<100	<10	<1	<1	<1	<2	<1	<3
RB02	3/06/2020	725527	<20	<20	<50	<50	<100	<100	<100	<20	<50	<100	<100	<100	<10	<1	<1	<1	<2	<1	<3
RB03	4/06/2020	725527	<20	<20	<50	<50	<100	<100	<100	<20	<50	<100	<100	<100	<10	<1	<1	<1	<2	<1	<3
RB04	5/06/2020	725527	<20	<20	<50	<50	<100	<100	<100	<20	<50	<100	<100	<100	<10	<1	<1	<1	<2	<1	<3
RB05	10/06/2020	725276	-	-	<50	<50	<100	<100	<100	-	<50	<100	<100	<100	-	-	-	-	-	-	-
RB06	11/06/2020	725276	-	-	<50	<50	<100	<100	<100	-	<50	<100	<100	<100	-	-	-	-	-	-	-
RB08	18/06/2020	727254	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<2	<1	<3
RB	13/07/2020	732705	<20	<20	<50	<50	<100	<100	<100	<20	<50	<100	<100	<100	<10	<1	<1	<1	<2	<1	<3
RB	15/07/2020	732705	<20	<20	<50	<50	<100	<100	<100	<20	<50	<100	<100	<100	<10	<1	<1	<1	<2	<1	<3
RB	16/07/2020	732705	<20	<20	100	100	<100	200	<100	<20	170	100	<100	270	<10	<1	<1	<1	<2	<1	<3
RB	24/08/2020	740295	<20	<20	<50	<50	<100	<100	<100	<20	<50	<100	<100	<100	<10	<1	<1	<1	<2	<1	<3
RB	25/08/2020	740295	<20	<20	<50	<50	<100	<100	<100	<20	<50	<100	<100	<100	<10	<1	<1	<1	<2	<1	<3
RB	26/08/2020	740295	<20	<20	<50	<50	<100	<100	<100	<20	<50	<100	<100	<100	<10	<1	<1	<1	<2	<1	<3
RB01	22/09/2020	745838	<20	<20	<50	<50	<100	<100	<100	<20	<50	<100	<100	<100	<10	<1	<1	<1	<2	<1	<3

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Monitoring Well	Date	TRH - 1999 NEPM Fractions (µg/L)					TRH - 2013 NEPM Fractions (µg/L)							Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylene (µg/L)			Naphthalene (µg/L)
		C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	C_{10}-C_{36} (Total)	C_6-C_{10}	F1	$>C_{10}$-C_{16}	F2	F3	F4	$>C_{10}$-C_{40} Total				m-	p-	o-	
NEPM HSL[1]		-	-	-	-	-	-	6,000	-	NL	-	-	-	5,000	NL	NL	NL	NL	NL	NL
ANZECC[2]		-	-	-	-	-	-	-	-	-	-	-	-	500	110	50	50	200	350	50
Fish (n=3)[3]		-	-	-	-	1400-2200	-	-	-	-	-	-	1400-2200	-	-	-	-	-	-	-
Crustacean (N=8)[3]		-	-	-	-	300-4500	-	-	-	-	-	-	300-4500	-	-	-	-	-	-	-
Molluscs (n=1)[3]		-	-	-	-	600	-	-	-	-	-	-	600	-	-	-	-	-	-	-
Annelids (n=6)[3]		-	-	-	-	800-3200	-	-	-	-	-	-	800-3200	-	-	-	-	-	-	-
Algae (n=6)[3]		-	-	-	-	500-1600	-	-	-	-	-	-	500-1600	-	-	-	-	-	-	-
MW01	*30/07/2020*	<20	150	<100	<100	150	20	<20	**140**	140	**<100**	<100	150	<1	<1	2	<2		3	<10
MW02	*30/07/2020*	<20	<50	<100	<100	<100	<20	<20	**<50**	<50	<100	**<100**	<120	<1	<1	<1	<2		<1	<10
MW03	*30/07/2020*	<20	<50	<100	<100	<100	<20	<20	<50	**<50**	**<100**	<100	<120	<1	<1	<1	<2		<1	<10
MW04	*30/07/2020*	<20	100	600	<100	700	<20	**<20**	240	**240**	400	<100	650	<1	<1	<1	<2		<1	<10
MW01A	*14/10/2020*	<20	<50	500	200	700	20	**<20**	140	**140**	600	<100	600	<1	<1	2	<2		3	<10
MW02	*14/10/2020*	<20	<50	<100	<100	<100	**<20**	<20	**<50**	<50	<100	<100	<120	<1	<1	<1	<2		<1	<10
MW03	*14/10/2020*	<20	<50	<100	<100	<100	<20	**<20**	**<50**	<50	<100	<100	<120	<1	<1	<1	<2		<1	<10
MW04	*14/10/2020*	<20	210	1600	<100	1810	**<20**	**<20**	520	520	1300	<100	1820	<1	<1	<1	<2		1	<10
MW05	*31/10/2020*	<20	<50	<100	<100	**<100**	**<20**	**<20**	<50	<50	<100	<100	<120	<1	<1	<1	<2		<1	<10
MW06	*31/10/2020*	<20	<50	<100	<100	**<100**	**<20**	**<20**	<50	<50	<100	<100	<120	<1	<1	<1	<2		<1	<10
MW07	*31/10/2020*	<20	<50	<100	<100	<100	**<20**	**<20**	<50	<50	<100	<100	<120	<1	<1	<1	<2		<1	<10
MW08	*31/10/2020*	<20	<50	<100	<100	<100	**<20**	<20	<50	<50	<100	<100	<120	<1	<1	<1	<2		<1	<10

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F1 = C_6-C_{10} less BTEX; F2 = $>C_{10}$-C_{16} less naphthalene; F3 = $>C_{16}$-$C_{34;}$ F4 = $>C_{34}$-C_{40}

1 = Groundwater Health Screening Level for vapour intrusion – Commercial/industrial land use with sand 2 m to <4 m. *Assessment of Site Contamination National Environment Protection Measure* (1999). National Environment Protection Council (as amended 2013)

2 = Marine ecosystems (99 % protection) – ANZG 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia. Available at www.waterquality.gov.au/anz-guidelines

3 = Table 8.3.24 from ANZECC 2018 Toxicity ranges for different oils to marine organisms—from from Tsvetnenko (1998). LC50 figures normalised (Hamoda et al. 1989) (mg/L)

Duplicate/Triplicate Relative Percent Differences							
Analyte	MW01	MWQA01	RPD		MW01	MWQA02	RPD
Benzene	< 0.001	< 0.001	0		< 0.001	< 0.001	0
Ethylbenzene	0.002	0.002	0		0.002	0.001	**67**
m&p-Xylenes	< 0.002	< 0.002	0		< 0.002	< 0.002	N/A
o-Xylene	0.003	0.003	0		0.003	0.003	0
Toluene	< 0.001	< 0.001	0		< 0.001	< 0.002	N/A
Naphthalene	< 0.01	< 0.01	0		< 0.01	<0.005	N/A
TRH C6-C9	< 0.02	< 0.02	0		< 0.02	< 0.02	0
TRH C10-C14	0.15	0.025	**143**		0.15	0.025	**143**
TRH C15-C28	< 0.1	< 0.1	0		< 0.1	<0.1	0
TRH C29-C36	< 0.1	< 0.1	0		< 0.1	<0.05	N/A
TRH C6-C10	0.02	0.01	**67**		0.02	0.01	**67**
TRH >C10-C16 less Naphthalene (F2)	0.14	0.025	**140**		0.14	0.01	**173**
TRH >C10-C16	0.14	0.025	**140**		0.14	0.05	**95**
TRH C6-C10 less BTEX (F1)	< 0.02	< 0.02	0		< 0.02	<0.1	N/A
TRH >C16-C34	< 0.1	< 0.1	0		< 0.1	<0.1	0
TRH >C34-C40	< 0.1	< 0.1	0		< 0.1	<0.1	0

Rinsate Blank & Trip Blank		
Analyte	RB01	TB01
Benzene	< 0.001	< 0.001
Ethylbenzene	< 0.001	< 0.001
m&p-Xylenes	< 0.002	< 0.002
o-Xylene	< 0.001	< 0.001
Toluene	< 0.001	< 0.001
Xylenes - Total*	< 0.003	< 0.003
Naphthalene	< 0.01	-
TRH C6-C9	< 0.02	-
TRH C10-C14	< 0.05	-
TRH C15-C28	< 0.1	-
TRH C29-C36	< 0.1	-
TRH C10-C36 (Total)	< 0.1	-
TRH C6-C10	< 0.02	-
TRH C6-C10 less BTEX (F1)	< 0.02	-
TRH >C10-C16	< 0.05	-
TRH >C10-C16 less Naphthalene (F2)	< 0.05	-
TRH >C16-C34	< 0.1	-
TRH >C34-C40	< 0.1	-
TRH >C10-C40 (total)*	< 0.1	-

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Duplicate/Triplicate Relative Percent Differences														
Date	14/10/2020	14/10/2020			14/10/2020	14/10/2020			31/10/2020	31/10/2020			31/10/2020	31/10/2020	
Analyte	MW02	QA01	RPD		MW02	QA02	RPD		MW05	QC01	RPD		MW05	QC01A	RPD
Benzene	< 0.001	< 0.001	0		< 0.001	< 0.001	0		< 0.001	< 0.001	0		< 0.001	< 0.001	0
Ethylbenzene	<0.001	<0.001	0		<0.001	<0.001	0		<0.001	<0.001	0		<0.001	<0.001	0
m&p-Xylenes	< 0.002	< 0.002	0		< 0.002	< 0.002	0		< 0.002	< 0.002	0		< 0.002	< 0.002	0
o-Xylene	<0.001	<0.001	0		<0.001	<0.001	0		<0.001	<0.001	0		<0.001	<0.001	0
Toluene	< 0.001	< 0.001	0		< 0.001	< 0.001	0		< 0.001	< 0.001	0		< 0.001	< 0.001	0
Naphthalene	< 0.01	< 0.01	0		< 0.01	< 0.01	0		< 0.01	< 0.01	0		< 0.01	< 0.01	0
TRH C6-C9	< 0.02	< 0.02	0		< 0.02	< 0.02	0		< 0.02	< 0.02	0		< 0.02	< 0.02	0
TRH C10-C14	<0.05	<0.05	0		<0.05	<0.05	0		<0.05	<0.05	0		<0.05	<0.05	0
TRH C15-C28	<0.1	<0.1	0		<0.1	<0.1	0		<0.1	<0.1	0		<0.1	<0.1	0
TRH C29-C36	<0.1	<0.1	0		<0.1	<0.1	0		<0.1	<0.1	0		<0.1	<0.1	0
TRH C6-C10	<0.02	<0.02	0		<0.02	<0.02	0		<0.02	<0.02	0		<0.02	<0.02	0
TRH >C10-C16 less Naphthalene (F2)	<0.05	<0.05	0		<0.05	<0.05	0		<0.05	<0.05	0		<0.05	<0.05	0
TRH >C10-C16	<0.05	<0.05	0		<0.05	<0.05	0		<0.05	<0.05	0		<0.05	<0.05	0
TRH C6-C10 less BTEX (F1)	< 0.02	< 0.02	0		< 0.02	< 0.02	0		< 0.02	< 0.02	0		< 0.02	< 0.02	0
TRH >C16-C34	< 0.1	< 0.1	0		< 0.1	< 0.1	0		< 0.1	< 0.1	0		< 0.1	< 0.1	0
TRH >C34-C40	< 0.1	< 0.1	0		< 0.1	< 0.1	0		< 0.1	< 0.1	0		< 0.1	< 0.1	0

Rinsate Blank & Trip Blank		
Date	14/10/2020	14/10/2020
Analyte	RB01	TB01
Benzene	< 0.001	< 0.001
Ethylbenzene	< 0.001	< 0.001
m&p-Xylenes	< 0.002	< 0.002
o-Xylene	< 0.001	< 0.001
Toluene	< 0.001	< 0.001
Xylenes - Total*	< 0.003	< 0.003
Naphthalene	< 0.01	-
TRH C6-C9	< 0.02	-
TRH C10-C14	< 0.05	-
TRH C15-C28	< 0.1	-
TRH C29-C36	< 0.1	-
TRH C10-C36 (Total)	< 0.1	-
TRH C6-C10	< 0.02	-
TRH C6-C10 less BTEX (F1)	< 0.02	-
TRH >C10-C16	< 0.05	-
TRH >C10-C16 less Naphthalene (F2)	< 0.05	-
TRH >C16-C34	< 0.1	-
TRH >C34-C40	< 0.1	-
TRH >C10-C40 (total)*	< 0.1	-

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Rinsate Blank & Trip Blank		
Date	31/10/2020	31/10/2020
Analyte	RB01	TB01
Benzene	< 0.001	< 0.001
Ethylbenzene	< 0.001	< 0.001
m&p-Xylenes	< 0.002	< 0.002
o-Xylene	< 0.001	< 0.001
Toluene	< 0.001	< 0.001
Xylenes - Total*	< 0.003	< 0.003
Naphthalene	< 0.01	-
TRH C6-C9	< 0.02	-
TRH C10-C14	< 0.05	-
TRH C15-C28	< 0.1	-
TRH C29-C36	< 0.1	-
TRH C10-C36 (Total)	< 0.1	-
TRH C6-C10	< 0.02	-
TRH C6-C10 less BTEX (F1)	< 0.02	-
TRH >C10-C16	< 0.05	-
TRH >C10-C16 less Naphthalene (F2)	< 0.05	-
TRH >C16-C34	< 0.1	-
TRH >C34-C40	< 0.1	-
TRH >C10-C40 (total)*	< 0.1	-

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Diesel Spill – Detailed Site Investigation

One Rail Australia

Berrimah Freight Terminal, Export Drive, Berrimah NT

Appendix A TEST PIT, SOIL BORE LOGS AND CALIBRATION CERTIFICATES

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GREENCAP
Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **TP01**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 2/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46698° Y = 130.91850°
Logged by: Stuart Carroll
Total Depth: 1.30 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S. FILL Very dense light greyish brown silty gravelly (F-C) SAND		0.00	Dry	No odour or visual evidence of contamination	-	TP01_0.0	0.00
0.10	FILL Very stiff yellowish brown gravelly (F-C) sandy SILT with trace fine mica; Significant claystone/siltstone cobbles & boulders		0.10	Dry	No odour or visual evidence of contamination	-	TP01_0.1 (QA01 & QA02)	0.10
0.20			0.20					0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50			0.50					0.50
0.60			0.60					0.60
0.70			0.70	Slightly Moist	No odour or visual evidence of contamination	-	TP01_0.7	0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10			1.10					1.10
1.20			1.20	Slightly Moist	No odour or visual evidence of contamination	-	TP01_1.2	1.20
1.30	Refusal at depth 1.30 m		1.30					1.30
1.40			1.40					1.40
1.50			1.50					1.50

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Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. TP02

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm,NT
Date of Invest: 2/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46702° Y= 130.91838°
Logged by: Stuart Carroll
Total Depth: 1.25 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S. FILL Very dense light greyish brown silty gravelly (F-C) SAND		0.00	Dry	No odour or visual evidence of contamination	-	TP02_0.0	0.00
0.10			0.10	Dry	No odour or visual evidence of contamination	-	TP02_0.1	0.10
0.20	FILL Very stiff yellowish brown gravelly (F-C) sandy SILT with trace fine mica; Significant claystone/siltstone cobbles & boulders		0.20					0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50			0.50					0.50
0.60			0.60	Slightly Moist	No odour or visual evidence of contamination	-	TP02_0.6	0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10			1.10	Slightly Moist	No odour or visual evidence of contamination	-	TP02_1.1	1.10
1.20			1.20					1.20
	Refusal at depth 1.25 m							
1.30			1.30					1.30
1.40			1.40					1.40
1.50			1.50					1.50

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GREENCAP
Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **TP03**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 2/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46708° Y = 130.91824°
Logged by: Stuart Carroll
Total Depth: 2.1 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00	Slightly Moist	No odour/visual contam.	-	TP03_0.0	0.00
0.10	FILL Very dense light greyish brown silty gravelly (F-C) SAND		0.10	Dry	No odour/visual contam.	-	TP03_0.09	0.10
0.20	FILL Hard reddish brown gravelly (F-C; SBR-ANG) clayey SILT		0.20	Slightly Moist	No odour or visual evidence of contamination	-	TP03_0.20	0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50	Very stiff yellowish brown gravelly (F-C) sandy SILT with trace fine mica; significant claystone/siltstone cobbles & boulders		0.50					0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80	Slightly Moist	No odour or visual evidence of contamination	-	TP03_0.75	0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10			1.10					1.10
1.20			1.20					1.20
1.30			1.30					1.30
1.40			1.40					1.40
1.50			1.50	Slightly Moist	No odour or visual evidence of contamination	-	TP03_1.50	1.50
1.60			1.60					1.60
1.70			1.70					1.70
1.80			1.80					1.80
1.90			1.90					1.90
2.00			2.00	Slightly Moist	No odour or visual evidence of contamination	-	TP03_2.0	2.00
2.10	Terminated at depth 2.10 m (reach of excavator)		2.10					2.10
2.20			2.20					2.20
2.30			2.30					2.30
2.40			2.40					2.40
2.50			2.50					2.50
2.60			2.60					2.60
2.70			2.70					2.70
2.80			2.80					2.80

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GREENCAP
Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. TP04

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 3/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46710° Y= 130.91812°
Logged by: Stuart Carroll
Total Depth: 2.1 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00	Dry	No odour or visual evidence of contamination	-	TP04_0.0	0.00
0.10	FILL Very dense light greyish brown Silty Gravelly (F-C) SAND		0.10	Slightly Moist	No odour or visual evidence of contamination	-	TP04_0.1	0.10
0.20	FILL Very stiff yellowish brown gravelly (F-C) Sandy SILT with trace fine mica; Significant claystone/siltstone cobbles & boulders		0.20					0.20
0.30			0.30					0.30
0.40			0.40	Slightly Moist	No odour or visual evidence of contamination	-	TP04_0.4	0.40
0.50			0.50					0.50
0.60			0.60	Slightly Moist	No odour or visual evidence of contamination		TP04_0.6	0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10			1.10	Slightly Moist	No odour or visual evidence of contamination	-	TP04_1.1	1.10
1.20			1.20					1.20
1.30			1.30					1.30
1.40			1.40					1.40
1.50			1.50					1.50
1.60			1.60					1.60
1.70			1.70					1.70
1.80			1.80	Slightly Moist	No odour or visual evidence of contamination	-	TP04_1.8	1.80
1.90			1.90					1.90
2.00			2.00					2.00
2.10	Terminated at depth 2.10 m (reach of excavator)		2.10	Slightly Moist	No odour or visual evidence of contamination	-	TP04_2.05	2.10
2.20			2.20					2.20

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **TP05**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 3/06/2020
Client: One Rail Australia
Water Level: 1.15 m bgl
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46677° Y= 130.91875°
Logged by: Stuart Carroll
Total Depth: 1.65 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00					0.00
	FILL Very stiff yellowish brown gravelly (F-C) sandy SILT with trace fine mica; Significant claytone/siltstone cobbles & boulders			Slightly Moist	No odour or visual evidence of contamination	-	TP05_0.0	
0.60	NATURAL Soft dark grey to greenish grey silty CLAY with high amount of organic material to sandy clay		0.60	Slightly Moist	Mild sulfurous odour	-	TP05_0.65	0.60
1.10			1.10	Wet	Water strike at 1.15 m	-	TP05_1.15	1.10
1.65	Terminated at depth 1.65 m							

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TEST PT No. **TP06**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 3/06/2020
Client: One Rail Australia
Water Level: 1.50 m bgl
Drilling method: Excavator
Lot No.: NA
Coordinates: X = -12.46680° Y = 130.91861°
Logged by: Stuart Carroll
Total Depth: 1.65 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00					0.00
	FILL Very dense light greyish brown silty gravelly (F-C) SAND			Slightly Moist	No odour or visual evidence of contamination	-	TP06_0.0	
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50			0.50					0.50
0.60			0.60					0.60
0.70			0.70					0.70
	NATURAL Soft dark grey to greenish grey Silty CLAY with high amount of organic material and some sandy clay			Moist	No odour or visual evidence of contamination	-	TP06_0.75	
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10			1.10					1.10
1.20			1.20					1.20
1.30			1.30					1.30
1.40			1.40					1.40
1.50			1.50	Wet	No odour or visual evidence of contamination	-	TP06_1.50	1.50
1.60			1.60					1.60
	Terminated at depth 1.65 m							
1.70			1.70					1.70
1.80			1.80					1.80

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ENVIRONMENTAL LOG
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TEST PT No. TP07

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 3/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X=-12.46683° Y= 130.91853°
Logged by: Stuart Carroll
Total Depth: 1.95 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00					0.00
	FILL Light greyish brown SAND			Slightly Moist	No odour or visual evidence of contamination	-	TP07_0.0	
0.10	FILL		0.10	Slightly Moist	No odour or visual evidence of contamination	-	TP07_0.1	0.10
	Very dense light greyish brown silty gravelly (F-C) SAND							
0.20			0.20					0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50			0.50					0.50
0.60			0.60					0.60
	FILL Very stiff yellowish brown gravelly (F-C) sandy SILT with trace fine mica; Significant claysonte/siltstone cobbles & boulders							
0.70			0.70	Moist	No odour or visual evidence of contamination	-	TP07_0.7	0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10			1.10					1.10
1.20			1.20	Very moist	No odour or visual evidence of contamination	-	TP07_1.2	1.20
1.30			1.30					1.30
1.40			1.40					1.40
1.50			1.50	Very moist	No odour or visual evidence of contamination	-	TP07_1.5	1.50
1.60			1.60	Very moist	No odour or visual evidence of contamination	-	TP07_1.6	1.60
1.70			1.70					1.70
1.80			1.80					1.80
1.90			1.90	Very moist	No odour or visual evidence of contamination	-	TP07_1.9	1.90
	Terminated at depth 1.95 m							
2.00			2.00					2.00

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ENVIRONMENTAL LOG
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TEST PT No. **TP08**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 3/06/2020
Client: One Rail Australia
Water Level: N/A
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46681° Y= 130.91843°
Logged by: Stuart Carroll
Total Depth: 2.0 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00					0.00
	FILL Light greyish brown SAND			Slightly Moist	No odour or visual evidence of contamination	-	TP08_0.0	
0.10			0.10			-	TP08_0.05	0.10
	FILL Very stiff yellowish brown gravelly (F-C) sandy SILT with trace fine mica; Significant claystone/siltstone cobbles & boulders			Slightly Moist	No odour or visual evidence of contamination			
0.40			0.40					0.40
	NATURAL Soft dark grey to greenish grey silty CLAY with high amount of organic material and some Sandy Clay			Very moist	No odour or visual evidence of contamination	-	TP08_0.45	
0.60			0.60	Very moist	No odour or visual evidence of contamination	-	TP08_0.65	0.60
0.80			0.80					0.80
1.00			1.00					1.00
1.20			1.20					1.20
1.30			1.30	Very moist	No odour or visual evidence of contamination	-	TP08_1.30	1.30
1.40			1.40					1.40
1.60			1.60					1.60
1.70			1.70					1.70
	NATURAL Light greyish to yellowish brown sandy clayey GRAVEL (F-M; SBR-SAG)			Very moist	No odour or visual evidence of contamination	-	TP08_1.70	
1.90			1.90					1.90
2.00	Terminated at depth 2.0 m		2.00					2.00
2.10			2.10					2.10

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TEST PT No. **TP09**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 3/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46750° Y= 130.91849°
Logged by: Stuart Carroll
Total Depth: 2.15 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00	Dry	No odour or visual evidence of contamination	-	TP09_0.0	0.00
0.10	FILL Loose bluish grey angular sandy GRAVEL		0.10					0.10
0.20	FILL Dense yellowish brown silty gravelly (C) SAND with some coarse asphalt gravels		0.20	Slightly Moist	No odour or visual evidence of contamination	-	TP09_0.15	0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50	FILL Very stiff yellowish brown gravelly (F-C) sandy SILTwith trace fine mica; Significant claystone/siltstone cobbles & boulders		0.50	Slightly Moist	No odour or visual evidence of contamination	-	TP09_0.5	0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00	Slightly Moist	No odour or visual evidence of contamination	-	TP09_1.0	1.00
1.10			1.10					1.10
1.20			1.20					1.20
1.30			1.30					1.30
1.40			1.40					1.40
1.50			1.50	Slightly Moist	No odour or visual evidence of contamination	-	TP09_1.50	1.50
1.60			1.60					1.60
1.70			1.70					1.70
1.80			1.80					1.80
1.90			1.90					1.90
2.00			2.00	Slightly Moist	No odour or visual evidence of contamination	-	TP09_2.0	2.00
2.10			2.10	Slightly Moist	No odour or visual evidence of contamination	-	TP09_2.15	2.10
2.20	Terminated at depth 2.15 m		2.20					2.20
2.30			2.30					2.30
2.40			2.40					2.40

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TEST PT No. **TP10**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 5/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46724° Y = 130.91881°
Logged by: Stuart Carroll
Total Depth: 0.55 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S. RAIL BALLAST		0.00	Dry	No odour or visual evidence of contamination	-		0.00
0.10			0.10					0.10
0.20			0.20					0.20
0.30	FILL Medium density brown gravelly (F-C) Silty SAND		0.30	Slightly Moist	No odour or visual evidence of contamination	4.3	TP10_0.25	0.30
0.40	FILL Dense yellowish brown silty Gravelly SAND		0.40	Slightly Moist	No odour or visual evidence of contamination	3.8	TP10_0.35	0.40
0.50	Terminated at depth 0.55 m		0.50					0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. TP11

Project Name: Diesel Spill - Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 10/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X =-12.46747° Y = 130.91847°
Logged by: Stuart Carroll
Total Depth: 1.0 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	Rail line.		0.00					0.00
	RAIL BALLAST			Dry	Stained & HC odour	-		
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
	FILL Brownish black silty gravelly (C) SAND			Slightly Moist	Stained & HC odour	135.50	TP11_0.35	
0.40			0.40					0.40
	FILL Firm light brownish yellow sandy gravelly SILT							
0.50			0.50					0.50
				Slightly Moist	HC Odour	196.7	TP11_0.55	
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80	Slightly Moist	No odour or visual evidence of contamination	19.0	TP11_0.8	0.80
0.90			0.90					0.90
1.00	Terminated at depth 1.0 m		1.00					1.00
1.10			1.10					1.10
1.20			1.20					1.20

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. TP12

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 5/06/2020
Client: One Rail Australia Pty Ltd
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X = 12.46746° Y= 130.91850°
Logged by: Stuart Carroll
Total Depth: 1.0 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
G.S.								
0.00	FILL Loose bluish grey sandy GRAVEL (F-C; ANG)		0.00	Dry	No odour or visual evidence of contamination	0.2	TP12_0.0	0.00
0.10			0.10					0.10
0.20	FILL Firm light orangey brown silty gravelly SAND		0.20	Slightly Moist	No odour or visual evidence of contamination	0.1	TP12_0.2	0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50			0.50					0.50
0.60	FILL Brownish Black Silty Gravelly (C) SAND		0.60	Slightly Moist	No odour or visual evidence of contamination	0.1	TP12_0.6	0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00	Terminated at depth 1.0 m		1.00					1.00
1.10			1.10					1.10
1.20			1.20					1.20

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **TP13**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 10/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: x = -12.46754° Y= 130.91840°
Logged by: Stuart Carroll
Total Depth: 0.8 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00					0.00
	FILL Light orangey brown gravelly silty SAND			Slightly Moist	HC Odour	-	TP13_0.0 (QA11 & QA12)	
0.10			0.10					0.10
0.20			0.20					0.20
	FILL ASPHALT							
0.30			0.30					0.30
	FILL Stiff orangey brown gravelly (F-C) sandy SILT			Slightly Moist	HC Odour	209.9	TP13_0.35	
0.40			0.40					0.40
0.50			0.50					0.50
	FILL Light brown sandy gravelly SILT							
0.60			0.60	Slightly Moist	-	164.1	TP13_0.6	0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00	Terminated at depth 1.0 m		1.00	Slightly Moist	Faint HC odour	4.1	TP13_1.0	1.00
1.10			1.10					1.10

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TEST PT No. **TP14**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 10/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X = -12.46759° Y = 130.91824°
Logged by: Stuart Carroll
Total Depth: 0.8 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00					0.00
	FILL Medium density light whitish brown silty gravelly (F-C) SAND			Dry	No odour or visual evidence of contamination	0.1	TP14_0.0	
0.10			0.10					0.10
0.20	FILL Light brown gravelly (F-C) silty SAND		0.20	Slightly Moist	No odour or visual evidence of contamination	0.0	TP14_0.20	0.20
0.30			0.30					0.30
0.40	FILL Firm orangey brown sandy gravelly SILT		0.40	Slightly Moist	No odour or visual evidence of contamination	0.1	TP14_0.40	0.40
0.50			0.50					0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80	Terminated at depth 0.8 m		0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00

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TEST PIT

TEST PT No. TP15

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 10/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X =-12.46755° Y =130.91824°
Logged by: Stuart Carroll
Total Depth: 0.6 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	~~Rail line.~~ RAIL BALLAST		0.00	Dry				0.00
0.10			0.10					0.10
0.20			0.20					0.20
0.30	FILL Firm orangey brown sandy gravelly (F-C) SILT		0.30	Slightly Moist	No odour or visual evidence of contamination	3.4	TP15_0.30 (QA13 & QA14)	0.30
0.40			0.40					0.40
0.50			0.50					0.50
0.60	Terminated at depth 0.6 m		0.60	Slightly Moist	No odour or visual evidence of contamination	1.0	TP15_0.60	0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00

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TEST PIT

TEST PT No. TP16

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm,NT
Date of Invest: 10/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46758° Y= 130.91824°
Logged by: Stuart Carroll
Total Depth: 1.0 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00					0.00
	FILL Light brown gravelly (F-C) SAND			Slightly Moist	Moderate HC Odour	143.9	TP16_0.0	
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
	Light brown sandy rail ballast			Slightly Moist	HC Odour	570.7	TP16_0.35	
0.40			0.40					0.40
	FILL Firm yellowish brown to white sandy gravelly SILT with some cobbles			Slightly Moist	HC Odour	49.9	TP16_0.45	
0.50			0.50					0.50
0.60			0.60					0.60
0.70			0.70	Slightly Moist		43.1	TP16_0.70	0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00	Terminated at depth 1.0 m		1.00	Slightly Moist	No odour or visual evidence of contamination	2.5	TP16_1.0	1.00
1.10			1.10					1.10
1.20			1.20					1.20
1.30			1.30					1.30

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TEST PT No. TP17

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 11/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46796° Y = 130.91753°
Logged by: Stuart Carroll
Total Depth: 0.2 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S. FILL Loose light yellowish grey SAND (M)		0.00	Dry	No odour or visual evidence of contamination	0.0	TP17_0.0	0.00
0.05								0.05
0.10			0.10					0.10
0.15	FILL Light brown gravelly sandy SILT			Slightly Moist	HC Odour	49.7	TP17_0.15	
0.20	Terminated at depth 0.2 m - Drain apron		0.20					0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50			0.50					0.50

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TEST PT No. **TP18**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 11/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46779° Y = 130.91750°
Logged by: Stuart Carroll
Total Depth: 0.3 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S. FILL Loose light yellowish grey SAND (M)		0.00	Dry	No odour or visual evidence of contamination	0.1	TP18_0.0	0.00
0.10	FILL Light brown gravelly sandy SILT		0.10	Slightly Moist	No odour or visual evidence of contamination	0.0	TP18_0.1	0.10
0.20			0.20					0.20
0.30	Terminated at depth 0.3 m		0.30					0.30
0.40			0.40					0.40
0.50			0.50					0.50

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Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **TP19**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 11/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46778° Y = 130.91768°
Logged by: Stuart Carroll
Total Depth: 1.2 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00					0.00
	FILL Light orangey brown gravelly (F-C) sandy SILT			Slightly Moist	No odour or visual evidence of contamination	0.0	TP19_0.0	
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
	FILL Whitish brown sandy gravelly SILT with some cobbles			Slightly Moist	No odour or visual evidence of contamination	0.1	TP19_0.35	
0.40			0.40					0.40
0.50			0.50					0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90	Slightly Moist	No odour or visual evidence of contamination	0.3	TP19-0.9	0.90
1.00			1.00					1.00
1.10			1.10					1.10
1.20	Terminated at depth 1.2 m		1.20	Slightly Moist	No odour or visual evidence of contamination	0.2	TP19-1.2	1.20
1.30			1.30					1.30
1.40			1.40					1.40
1.50			1.50					1.50

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Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. TP20

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 11/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46774° Y = 130.91768°
Logged by: Stuart Carroll
Total Depth: 1.3 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00					0.00
	FILL Light orangey brown gravelly (F-C) sandy SILT			Slightly Moist	No odour or visual evidence of contamination	0.2	TP20_0.0	
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
0.40	FILL Whitish brown sandy gravelly SILT with some cobbles		0.40	Slightly Moist	No odour or visual evidence of contamination	0.1	TP20_0.40	0.40
0.50			0.50					0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90	Slightly Moist	No odour or visual evidence of contamination	0.5	TP20_0.90	0.90
1.00			1.00					1.00
1.10			1.10					1.10
1.20			1.20					1.20
1.30	Terminated at depth 1.3 m		1.30	Slightly Moist	No odour or visual evidence of contamination	0.1	TP20_1.3	1.30
1.40			1.40					1.40
1.50			1.50					1.50

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TEST PT No. TP21

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 11/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46729° Y = 130.91884°
Logged by: Stuart Carroll
Total Depth: 0.6 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S. RAIL BALLAST		0.00	Dry				0.00
0.10			0.10					0.10
0.20			0.20					0.20
0.30	FILL Firm whitish brown sandy gravelly SILT		0.30	Slightly Moist	No odour or visual evidence of contamination	0.0	TP21_0.35	0.30
0.40	FILL Firm yellowish brown to white sandy gravelly SILT with some cobbles		0.40	Slightly Moist	No odour or visual evidence of contamination	0.1	TP21_0.4	0.40
0.50			0.50					0.50
0.60	Terminated at depth 0.6 m		0.60	Slightly Moist	No odour or visual evidence of contamination	0.1	TP21_0.6	0.60
0.70			0.70					0.70
0.80			0.80					0.80

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TEST PT No. TP22

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 11/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46717° Y = 130.91879°
Logged by: Stuart Carroll
Total Depth: 0.6 m
Checked by: Robin Biua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	Rail line RAIL BALLAST		0.00	Dry	No odour or visual evidence of contamination	0.0	TP22_0.0	0.00
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
	FILL Firm yellowish brown to white sandy gravelly SILT with some cobbles			Slightly Moist	No odour or visual evidence of contamination	0.0	TP22_0.35 (QA15 & QA16)	
0.40			0.40					0.40
0.50			0.50					0.50
0.60	Terminated at depth 0.6 m		0.60	Slightly Moist	No odour or visual evidence of contamination	0.0	TP22_0.60	0.60
0.70			0.70					0.70
0.80			0.80					0.80

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TEST PT No. TP23

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 11/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46723° Y = 130.91862°
Logged by: Stuart Carroll
Total Depth: 0.6 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	~~Rail line~~		0.00					0.00
	RAIL BALLAST			Dry	Stained & HC odour			
0.10			0.10					0.10
0.20			0.20					0.20
0.30	FILL Brownish black silty gravelly SAND		0.30	Slightly Moist	Stained & HC odour	109.7		0.30
	FILL Firm whitish brown sandy gravelly SILT with some cobbles			Slightly Moist	HC odour	199.4	TP23_0.35 (QA17 & QA18)	
0.40			0.40					0.40
0.50			0.50					0.50
0.60	Terminated at depth 0.6 m		0.60			5.2	TP23_0.6	0.60
0.70			0.70					0.70
0.80			0.80					0.80

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TEST PIT

TEST PT No. TP24

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 11/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46744° Y = 130.91800°
Logged by: Stuart Carroll
Total Depth: 0.6 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	~~Rail line~~ RAIL BALLAST		0.00	Dry	No odour or visual evidence of contamination			0.00
0.30	FILL Firm yellowish brown to white gravelly SILT with some cobbles		0.30	Slightly Moist	Stained	0.0	TP24_0.30	0.30
	FILL Firm yellowish brown to white sandy gravelly SILT with some cobbles			Slightly Moist	No odour or visual evidence of contamination	0.1	TP24_0.35	
0.60	Terminated at depth 0.6 m		0.60	Slightly Moist	No odour or visual evidence of contamination	0.0	TP24_0.60	0.60

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TEST PT No. TP25

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 11/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46739° Y = 130.91809°
Logged by: Stuart Carroll
Total Depth: 0.7 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	Rail line.		0.00					0.00
	Rail Ballast				Stained & HC odour			
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
	FILL Firm whitish brown sandy gravelly SILT with some cobbles			Dry	Stained & HC odour	92.1	TP25_0.35	
0.40			0.40	Slightly Moist	Faint HC odour	35.6	TP25_0.40	0.40
	FILL Firm yellowish brown to white sandy gravelly SILT							
0.50			0.50					0.50
0.60			0.60					0.60
0.70	Terminated at depth 0.7 m		0.70	Slightly Moist	No odour or visual evidence of contamination	3.1	TP25_0.70	0.70
0.80			0.80					0.80

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TEST PT No. **TP26**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 11/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46753 Y = 130.91805°
Logged by: Stuart Carroll
Total Depth: 0.6 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	~~Rail line~~ RAIL BALLAST		0.00	Dry	No odour or visual evidence of contamination			0.00
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
	FILL Whitish brown sandy gravelly SILT with some cobbles			Slightly Moist	Stained	0.1	TP26_0.35	
0.40	FILL Firm yellowish brown to white sandy gravelly SILT with some cobbles		0.40	Slightly Moist	No odour or visual evidence of contamination	0.1	TP26_0.40	0.40
0.50			0.50					0.50
0.60	Terminated at depth 0.6 m		0.60	Slightly Moist	No odour or visual evidence of contamination	0.1	TP26_0.60	0.60
0.70			0.70					0.70
0.80			0.80					0.80

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TEST PT No. TP27

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 11/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46727° Y = 130.91884°
Logged by: Stuart Carroll
Total Depth: 0.6 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	~~Rail line~~ Rail Ballast		0.00	Dry	No odour or visual evidence of contamination			0.00
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
	FILL Firm brown gravelly silty SAND			Dry	No odour or visual evidence of contamination	0.1	TP27_0.35	
0.40			0.40					0.40
	FILL Firm yellowish brown to white sandy gravelly SILT with some cobbles			Slightly Moist	No odour or visual evidence of contamination	0.2	TP27_0.45	
0.50			0.50					0.50
0.60	Terminated at depth 0.6 m		0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80

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TEST PIT

TEST PT No. **TP27A**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 11/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46723° Y = 130.91884°
Logged by: Stuart Carroll
Total Depth: 0.6 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	~~Rail line~~		0.00					0.00
	Rail Ballast			Dry	No odour or visual evidence of contamination			
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
	FILL Firm brown gravelly silty SAND			Dry	No odour or visual evidence of contamination	0.1	TP27A_0.35	
0.40			0.40					0.40
	FILL Firm brownish yellowish to white sandy gravelly SILT with some cobbles			Slightly Moist	No odour or visual evidence of contamination	0.2	TP27A_0.45	
0.50			0.50					0.50
0.60	Terminated at depth 0.6 m		0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80

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TEST PT No. **TP28**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm,NT
Date of Invest: 11/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46764° Y = 130.91774°
Logged by: Stuart Carroll
Total Depth: 0.7 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S. FILL Sandy gravelly RAIL BALLAST		0.00	Dry	No odour or visual evidence of contamination	0.0		0.00
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
	FILL Dense grey gravelly SAND			Dry	No odour or visual evidence of contamination	0.0	TP28_0.35	
0.40			0.40					0.40
	FILL Orangey brown gravelly sandy SILT			Slightly Moist	No odour or visual evidence of contamination	0.0	TP28_0.45	
0.50			0.50					0.50
0.60			0.60					0.60
0.70	Terminated at depth 0.7 m		0.70					0.70
0.80			0.80					0.80

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TEST PT No. TP29

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 11/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46744° Y= 130.91833°
Logged by: Stuart Carroll
Total Depth: 1.2 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	Rail line Rail Ballast		0.00	Dry	Stained & HC odour			0.00
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
	FILL Brownish black silty gravelly SAND			Dry	HC odour	210.1	TP29_0.35	
0.40	FILL Firm whitish brown sandy gravelly SILT with some cobbles		0.40	Slightly Moist	HC odour	43.4	TP29_0.40	0.40
0.50			0.50					0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80	Slightly Moist	HC odour	151.8	TP29_0.8	0.80
0.90			0.90					0.90
1.00			1.00	Slightly Moist	HC odour	61.3	TP29_1.0	1.00
1.10			1.10					1.10
1.20	Terminated at depth 1.2 m		1.20	Slightly Moist	HC odour	3.9	TP29_1.2	1.20
1.30			1.30					1.30
1.40			1.40					1.40
1.50			1.50					1.50

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. TP30

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 11/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Spade
Lot No.: NA
Coordinates: X= -12.46779° Y = 130.91750°
Logged by: Stuart Carroll
Total Depth: 0.6 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S. FILL Loose light yellowish grey SAND (M)		0.00	Dry	No odour or visual evidence of contamination	0.1	TP30_0.0	0.00
0.10			0.10					0.10
0.20	FILL Firm light yellowish brown gravelly sandy SILT		0.20	Slightly Moist	No odour or visual evidence of contamination	0.0	TP30_0.2	0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50			0.50					0.50
0.60	Terminated at depth 0.6 m		0.60	Slightly Moist	No odour or visual evidence of contamination	0.0	TP30_0.6	0.60
0.40			0.40					0.40
0.50			0.50					0.50

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TEST PT No. **TP31**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 19/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Hand Trowel
Lot No.: NA
Coordinates: X=-12.46784 Y= 130.91745°
Logged by: Robin Birua
Total Depth: 0.01 m
Checked by: Stuart Carroll

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S. FILL Soft light brownish yellow sandy gravelly (F-M) clayey SILT		0.00	Slightly Moist	No odour or visual evidence of contamination		TP31_0.0	0.00
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50			0.50					0.50

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TEST PT No. TP32

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 19/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Hand Trowel
Lot No.: NA
Coordinates: X=-12.46795° Y= 130.91740°
Logged by: Robin Birua
Total Depth: 0.01 m
Checked by: Stuart Carroll

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S. FILL Medium density light yellowish grey gravelly (F-M) SAND Terminated at depth 0.01 m		0.00	Dry	No odour or visual evidence of contamination		TP32_0.0	0.00
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50			0.50					0.50

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TEST PT No. TP33

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 19/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Hand Trowel
Lot No.: NA
Coordinates: X= -12.46797° Y= 130.91736°
Logged by: Robin Birua
Total Depth: 0.5 m
Checked by: Stuart Carroll

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
	G.S.							
0.00	FILL Light yellowish grey gravelly (F-M) SAND		0.00	Dry	No odour or visual evidence of contamination			0.00
0.10			0.10					0.10
	FILL Light brown gravelly (F-M) sandy SILT			Dry	No odour or visual evidence of contamination		TP33_0.15	
0.20			0.20					0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50	Terminated at depth 0.5 m		0.50	Dry	No odour or visual evidence of contamination		TP33-0.50	0.50

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TEST PT No. **TP34**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 16/07/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46724° Y = 130.91881°
Logged by: Stuart Carroll
Total Depth: 0.6 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	Rail line Rail Ballast		0.00	Dry	No odour or visual evidence of contamination			0.00
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
	FILL Firm brown gravelly silty SAND			Dry	No odour or visual evidence of contamination	0.5	TP34_0.35	
0.40	FILL Firm yellowish brown to white **sandy** gravelly SILT with some cobbles		0.40	Slightly Moist	No odour or visual evidence of contamination	0.2	TP34_0.40	0.40
0.50			0.50					0.50
0.60	Terminated at depth 0.6 m		0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80

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Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. TP35

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 24/08/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46729° Y = 130.91851°
Logged by: Stuart Carroll
Total Depth: 1.05 m
Checked by:

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00					0.00
	FILL Medium density light brownish orange to whitish yellow gravelly (F-C) sandy SILT with a central column of medium to coarse angular gravels			Slightly Moist	Stained & HC odour	45.2		
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50			0.50	Slightly Moist	Stained & HC odour	117.5		0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00
	Terminated at depth 1.05 m			Slightly Moist	Stained & HC odour	190.5	TP35_1.05	
1.10			1.10					1.10
1.20			1.20					1.20
1.30			1.30					1.30
1.40			1.40					1.40
1.50			1.50					1.50

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Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. TP36

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 26/08/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46774° Y = 130.91752°
Logged by: Stuart Carroll
Total Depth: 1.5 m
Checked by:

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S. FILL Light orangey brown gravelly (F-C) sandy SILT with some cobbles and boulders		0.00	Slightly Moist	No odour or visual evidence of contamination	0.2	TP36_0.0	0.00
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
0.40			0.40	Slightly Moist	No odour or visual evidence of contamination	0.1	TP36_0.50	0.40
0.50			0.50					0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90	Slightly Moist	No odour or visual evidence of contamination	0.5	TP36_1.00	0.90
1.00			1.00					1.00
1.10			1.10					1.10
1.20			1.20					1.20
1.30			1.30					1.30
1.40			1.40					1.40
1.50	Terminated at depth 1.5 m		1.50	Slightly Moist	No odour or visual evidence of contamination	4.1	TP36_1.5	1.50

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Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. TP37

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 26/08/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Excavator
Lot No.: NA
Coordinates: X= -12.46772° Y = 130.91770°
Logged by: Stuart Carroll
Total Depth: 1.6 m
Checked by:

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00					0.00
	FILL Light orangey brown gravelly (F-C) sandy SILT with some cobbles and boulders			Slightly Moist	No odour or visual evidence of contamination		TP37_0.00	
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50			0.50	Slightly Moist	No odour or visual evidence of contamination	1.5	TP37_0.50	0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00	Slightly Moist	No odour or visual evidence of contamination	3.5	TP37_1.2	1.00
1.10			1.10					1.10
1.20			1.20					1.20
1.30			1.30					1.30
1.40			1.40					1.40
1.50			1.50					1.50
1.60	Terminated at depth 1.60 m		1.60	Moist	HC odour	97.3	TP37_1.6	1.60
1.70			1.70					1.70
1.80			1.80					1.80
1.90			1.90					1.90
2.00			2.00					2.00

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Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **BH01**

Project Name: Diesel Spill - Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 4/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46727° Y = 130.91838°
Logged by: Stuart Carroll
Total Depth: 1.5 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	Asphalt - 0.08 m		0.00					0.00
	FILL Medium density greyish brown gravelly (fine) SAND			Dry	No odour or visual evidence of contamination	1.4	BH01_0.0	
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30	Dry	No odour or visual evidence of contamination	1.8	BH01_0.3	0.30
0.40			0.40					0.40
0.50	FILL Very stiff reddish brown gravelly (F-C) sandy SILT with some cobbles/boulders		0.50	Dry	No odour or visual evidence of contamination	1.1	BH01_0.5	0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80	Dry	No odour or visual evidence of contamination	2.3	BH01_0.8	0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10			1.10					1.10
1.20	FILL Hard yellowish brown gravelly (F-C) sandy SILT		1.20	Slightly Moist	No odour or visual evidence of contamination	2.1	BH01_1.2	1.20
1.30			1.30					1.30
1.40			1.40					1.40
1.50	Terminated at depth 1.5m		1.50	Slightly Moist	No odour or visual evidence of contamination	1.8	BH01_1.5	1.50
1.60			1.60					1.60
1.70			1.70					1.70
1.80			1.80					1.80

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Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. BH02

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 4/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46729° Y = 130.91833°
Logged by: Stuart Carroll
Total Depth: 1.5 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	Asphalt - 0.8 m.		0.00	Slightly Moist	No odour or visual evidence of contamination	1.1	BH02_0.0	0.00
0.10	FILL Medium density greyish brown gravelly (fine) SAND		0.10					0.10
0.20			0.20					0.20
0.30	FILL Very stiff reddish brown gravelly (F-C) sandy SILT with some cobbles/boulders		0.30					0.30
0.40			0.40	Slightly Moist	No odour or visual evidence of contamination	1.2	BH02_0.4	0.40
0.50			0.50					0.50
0.60			0.60					0.60
0.70	FILL Hard yellowish brown sandy gravelly (F-C) SILT		0.70					0.70
0.80			0.80	Slightly Moist	No odour or visual evidence of contamination	1.3	BH02_0.8 (QA03 & QA04)	0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10			1.10					1.10
1.20			1.20					1.20
1.30			1.30	Slightly Moist	No odour or visual evidence of contamination	2.1	BH02_1.3	1.30
1.40			1.40					1.40
1.50	Terminated at depth 1.5 m		1.50	Slightly Moist	No odour or visual evidence of contamination	1.8	BH02_1.5	1.50
1.60			1.60					1.60

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. BH03

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 4/06/2020
Client: One Rail Australia
Water Level:
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46731° Y = 130.91838°
Logged by: Stuart Carroll
Total Depth: 1.5 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	~~Asphalt - 0.08 m~~		0.00					0.00
0.00	FILL Medium density greyish brown gravelly (fine) SAND		0.00	Slightly Moist	No odour or visual evidence of contamination	3.7	BH03_0.0	0.00
0.10			0.10					0.10
0.20			0.20					0.20
0.30	FILL Very stiff reddish brown gravelly (F-C) sandy SILT with some cobbles/boulders		0.30					0.30
0.40			0.40	Slightly Moist	No odour or visual evidence of contamination	2.1	BH03_0.35	0.40
0.50			0.50					0.50
0.60	Significant coarse gravels present at 0.6 m		0.60	Slightly Moist	No odour or visual evidence of contamination	2.0	BH03_0.60	0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10			1.10					1.10
1.20			1.20					1.20
1.30	FILL Hard yellowish brown sandy gravelly (F-C) SILT		1.30					1.30
1.40			1.40	Slightly Moist	No odour or visual evidence of contamination	1.9	BH03_1.4	1.40
1.50	Terminated at depth 1.5m		1.50					1.50
1.60			1.60					1.60
1.70			1.70					1.70
1.80			1.80					1.80
1.90			1.90					1.90
2.00			2.00					2.00
2.10			2.10					2.10
2.20			2.20					2.20
2.30			2.30					2.30
2.40			2.40					2.40
2.50			2.50					2.50

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **BH03A**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 4/06/2020
Client: One Rail Australia
Water Level: 3.1m
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46731° Y = 130.91838°
Logged by: Stuart Carroll
Total Depth: 4.5 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	~~Asphalt - 0.08 m~~		0.00					0.00
0.10	FILL Medium density greyish brown gravelly (fine) SAND		0.10	Slightly Moist	No odour or visual evidence of contamination			0.10
0.20			0.20					0.20
0.30	FILL Very stiff reddish brown gravelly (F-C) sandy SILT with some cobbles/boulders		0.30					0.30
0.40			0.40	Slightly Moist	No odour or visual evidence of contamination			0.40
0.50			0.50					0.50
0.60	Significant coarse gravels present at 0.6 m		0.60	Slightly Moist	No odour or visual evidence of contamination			0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10			1.10					1.10
1.20			1.20					1.20
1.30	FILL Hard yellowish brown sandy gravelly (F-C) SILT		1.30					1.30
1.40			1.40	Slightly Moist	No odour or visual evidence of contamination			1.40
1.50	FILL Hard yellowish brown sandy gravelly (F-C) SILT		1.50					1.50
1.60			1.60	Slightly Moist	No odour or visual evidence of contamination	1.4	BH03_1.6	1.60
1.70			1.70					1.70
1.80			1.80					1.80
1.90			1.90					1.90
2.00			2.00	Slightly Moist	No odour or visual evidence of contamination	1.2	BH03_2.0 (QA05 & QA06)	2.00
2.10			2.10					2.10
2.20			2.20					2.20
2.30			2.30					2.30
2.40			2.40					2.40
2.50			2.50					2.50

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **BH03A**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 4/06/2020
Client: One Rail Australia
Water Level: 3.1 m bgl
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46731° Y = 130.91838°
Logged by: Stuart Carroll
Total Depth: 4.5 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
2.50	FILL Hard yellowish brown sandy gravelly (F-C) SILT		2.60					2.60
2.70			2.70					2.70
2.80			2.80					2.80
2.90			2.90					2.90
3.00			3.00					3.00
3.10			3.10	Wet	No odour or visual evidence of contamination	1.2	BH03_3.1	3.10
3.20	FILL Hard yellowish brown to grey sandy gravelly (F-C) SILT		3.20	Wet	No odour or visual evidence of contamination	0.7	BH03_3.2	3.20
3.30			3.30					3.30
3.40			3.40					3.40
3.50			3.50					3.50
3.60			3.60					3.60
3.70			3.70					3.70
3.80			3.80					3.80
3.90			3.90					3.90
4.00			4.00	Wet	No odour or visual evidence of contamination	0.8	BH03_4.0	4.00
4.10			4.10					4.10
4.20			4.20					4.20
4.30			4.30					4.30
4.40			4.40					4.40
4.50	Terminated at depth 4.5 m		4.50	Moist	No odour or visual evidence of contamination	0.7	BH03-4.5	4.50
4.60			4.60					4.60
4.70			4.70					4.70
4.80			4.80					4.80
4.90			4.90					4.90
5.00			5.00					5.00

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. BH04

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 4/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46733° Y = 130.91837°
Logged by: Stuart Carroll
Total Depth: 1.5 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	FILL Dense greyish brown SAND		0.00	Slightly Moist	No odour or visual evidence of contamination	0.40	BH04_0.0	0.00
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30	Moist	No odour or visual evidence of contamination	0.50	BH02_0.25	0.30
0.40			0.40					0.40
0.50	FILL Dense greyish brown gravelly (fine) SAND		0.50	Slightly Moist	No odour or visual evidence of contamination	0.70	BH04_0.45	0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80	Slightly Moist	No odour or visual evidence of contamination	0.40	BH04_0.80	0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10			1.10					1.10
1.20			1.20					1.20
1.30	FILL Hard yellowish brown gravelly (F-C) sandy SILT		1.30	Slightly Moist	No odour or visual evidence of contamination	0.50	BH04_1.35	1.30
1.40			1.40					1.40
1.50	Terminated at depth 1.5 m		1.50					1.50
1.60			1.60					1.60
1.70			1.70					1.70
1.80			1.80					1.80

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. BH05

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 4/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46734° Y = 130.91832°
Logged by: Stuart Carroll
Total Depth: 1.5 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	Asphalt - 0.08 m		0.00					0.00
	FILL Medium density greyish brown gravelly (fine) SAND			Slightly Moist	No odour or visual evidence of contamination	0.7	BH05_0.0	
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
0.40	FILL Very stiff light reddish brown gravelly (C) sandy SILT with some cobbles/boulders		0.40	Slightly Moist	No odour or visual evidence of contamination	0.5	BH05_0.45	0.40
0.50			0.50					0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80	Slightly Moist	No odour or visual evidence of contamination	0.60	BH05_0.80	0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10			1.10					1.10
1.20			1.20					1.20
1.30			1.30					1.30
1.40	FILL Hard yellowish brown gravelly (F-C) sandy SILT		1.40	Slightly Moist	No odour or visual evidence of contamination	1.3	BH05_1.40	1.40
1.50	Terminated at depth 1.5 m		1.50					1.50
1.60			1.60					1.60
1.70			1.70					1.70
1.80			1.80					1.80

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **BH06**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 4/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46734° Y = 130.91832°
Logged by: Robin Birua
Total Depth: 1.5 m
Checked by: Stuart Carroll

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	Asphalt - 0.08 m		0.00					0.00
0.10	FILL Medium density greyish brown gravelly (fine) SAND		0.10	Slightly Moist	No odour or visual evidence of contamination	0.3	BH06_0.0	0.10
0.20			0.20					0.20
0.30			0.30					0.30
0.40	FILL Very stiff light reddish brown gravelly (C) sandy SILT with some cobbles/boulders		0.40	Slightly Moist	No odour or visual evidence of contamination	0.4	BH06_0.30	0.40
0.50			0.50					0.50
0.60			0.60					0.60
0.70			0.70	Slightly Moist	No odour or visual evidence of contamination	0.6	BH06_0.70	0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10			1.10					1.10
1.20	FILL Firm yellowish brown gravelly (F-C) sandy SILT		1.20	Slightly Moist	No odour or visual evidence of contamination	1.1	BH06_0.17	1.20
1.30			1.30					1.30
1.40			1.40	Slightly Moist	No odour or visual evidence of contamination	0.5	BH06_1.40	1.40
1.50	Terminated at depth 1.5 m		1.50					1.50
1.60			1.60					1.60
1.70			1.70					1.70
1.80			1.80					1.80

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **BH07**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 4/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46733° Y = 130.91823°
Logged by: Robin Birua
Total Depth: 1.45 m
Checked by: Stuart Carroll

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	FILL Medium density greyish brown gravelly (F-M) SAND		0.00	Slightly Moist	No odour or visual evidence of contamination	0.0		0.00
0.10			0.10					0.10
0.20			0.20	Slightly Moist	No odour or visual evidence of contamination	1.0	BH07_0.2	0.20
0.30			0.30					0.30
0.40			0.40	Slightly Moist				0.40
0.50			0.50	Slightly Moist	No odour or visual evidence of contamination	0.40	BH07_0.5	0.50
0.60	FILL Soft reddish brown gravelly (F-M; RND-SBR) sandy SILT		0.60					0.60
0.70			0.70					0.70
0.80			0.80	Slightly Moist	No odour or visual evidence of contamination	0.60	BH07_0.8	0.80
0.90	FILL Yellowish brown gravelly (F-M; RND-SBR) sandy SILT		0.90					0.90
1.00			1.00					1.00
1.10			1.10					1.10
1.20			1.20					1.20
1.30			1.30					1.30
1.40	Terminated at depth 1.45 m		1.40	Slightly Moist	No odour or visual evidence of contamination	1.1	BH07-1.35	1.40
1.50			1.50					1.50

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Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **BH08**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 4/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46729° Y = 130.91843°
Logged by: Robin Birua
Total Depth: 3.9 m
Checked by: Stuart Carroll

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	Asphalt - 0.17 m		0.00					0.00
0.10	FILL Soft yellowish brown sandy gravelly (F-M; RND-SBR) SILT		0.10	Slightly Moist	No odour or visual evidence of contamination			0.10
0.20			0.20	Slightly Moist	No odour or visual evidence of contamination	0.8	BH08-0.17	0.20
0.30			0.30					0.30
0.40	FILL Reddish brown lateritic gravelly (F-M) sandy SILT		0.40	Slightly Moist	No odour or visual evidence of contamination	0.7	BH08-0.40	0.40
0.50			0.50					0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10	FILL Firm brownish yellow sandy SILT with some gravels (F-M; RND-SBR)		1.10	Slightly Moist	No odour or visual evidence of contamination	0.9	BH08-1.05	1.10
1.20			1.20					1.20
1.30			1.30					1.30
1.40			1.40	Slightly Moist	No odour or visual evidence of contamination	1.2	BH08-1.40	1.40
1.50	Terminated at depth 1.50 m		1.50					1.50
1.60			1.60					1.60
1.70			1.70					1.70
1.80			1.80					1.80
1.90			1.90					1.90
2.00			2.00					2.00

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Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **BH08A**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 4/06/2020
Client: One Rail Australia
Water Level: 3.1 m bgl
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46729° Y = 130.91843°
Logged by: Robin Birua
Total Depth: 3.9 m
Checked by: Stuart Carroll

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	Asphalt - 0.17 m		0.00					0.00
0.10	FILL Soft yellowish brown sandy gravelly (F-M; RND-SBR) SILT		0.10	Slightly Moist	No odour or visual evidence of contamination			0.10
0.20			0.20	Slightly Moist	No odour or visual evidence of contamination			0.20
0.30			0.30					0.30
0.40	FILL Reddish brown lateritic gravelly (F-M) sandy SILT		0.40	Slightly Moist	No odour or visual evidence of contamination			0.40
0.50			0.50					0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10	FILL Firm brownish yellow sandy SILT with some gravels (F-M; RND-SBR)		1.10	Slightly Moist	No odour or visual evidence of contamination			1.10
1.20			1.20					1.20
1.30			1.30					1.30
1.40			1.40	Slightly Moist	No odour or visual evidence of contamination			1.40
1.50	FILL Firm brownish yellow sandy SILT with some gravels (F-M; RND-SBR)		1.50					1.50
1.60			1.60					1.60
1.70			1.70					1.70
1.80			1.80					1.80
1.90			1.90					1.90
2.00			2.00					2.00

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Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **BH08A**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 4/06/2020
Client: One Rail Australia
Water Level: 3.1 m
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46729° Y = 130.91843°
Logged by: Robin Birua
Total Depth: 3.9 m
Checked by: Stuart Carroll

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
2.00	FILL Firm brownish yellow sandy SILT with some gravels (F-M; RND-SBR)			Slightly Moist	No odour or visual evidence of contamination	4.4	BH08-2.0	
2.10			2.10					2.10
2.20			2.20					2.20
2.30			2.30					2.30
2.40			2.40					2.40
2.50	FILL Very stiff light brownish orange gravelly (F-C) sandy SILT		2.50	Moist	Faint HC odour	7.3	BH08_2.5	2.50
2.60			2.60					2.60
2.70			2.70					2.70
2.80			2.80					2.80
2.90			2.90					2.90
3.00			3.00	Wet	Water Strike - 3.0 m No odour or visual evidence of contamination	8.2	BH08_3.0	3.00
3.10			3.10					3.10
3.20			3.20					3.20
3.30			3.30					3.30
3.40			3.40					3.40
3.50			3.50	Wet	Faint HC odour	3.2	BH08_3.5 (QA07 & QA08)	3.50
3.60			3.60					3.60
3.70			3.70					3.70
3.80			3.80					3.80
3.90	Terminated at depth 3.90 m		3.90	Wet	Faint HC odour	32	BH08_3.9	3.90
4.00			4.00					4.00

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Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. BH09

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 4/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46729° Y = 130.91847°
Logged by: Robin Birua
Total Depth: 1.50 m
Checked by: Stuart Carroll

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	Asphalt - 0.08 m		0.00					0.00
	FILL Soft yellowish brown sandy gravelly (F-M; RND-SBR) SILT			Slightly Moist	No odour or visual evidence of contamination			
0.10			0.10					0.10
0.20			0.20					0.20
	FILL Reddish brown lateritic gravelly (F-M) sandy SILT			Slightly Moist	No odour or visual evidence of contamination	4.3	BH09_0.25	
0.30			0.30					0.30
0.40			0.40					0.40
0.50			0.50					0.50
0.60	FILL Firm brownish yellow sandy SILT with some gravels (F-M; RND-SBR)		0.60	Slightly Moist	No odour or visual evidence of contamination	3.9	BH09_0.60	0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10			1.10	Slightly Moist	No odour or visual evidence of contamination	3.5	BH09_1.07	1.10
1.20			1.20					1.20
1.30			1.30					1.30
1.40			1.40	Slightly Moist	No odour or visual evidence of contamination	4.7	BH09_1.35	1.40
1.50	Terminated at depth 1.5 m		1.50					1.50
1.60			1.60					1.60

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Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. BH10

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 4/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46727° Y = 130.91851°
Logged by: Stuart Carroll
Total Depth: 1.50 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	~~Asphalt - 0.08 m~~		0.00					0.00
	FILL Medium density greyish brown gravelly (fine) SAND			Slightly Moist	No odour or visual evidence of contamination	2.9	BH10_0.0	
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30	Slightly Moist	No odour or visual evidence of contamination	3.0	BH10_0.3	0.30
0.40			0.40					0.40
0.50			0.50					0.50
0.60			0.60					0.60
0.70			0.70					0.70
	FILL Very stiff reddish brown gravelly (F-C) sandy SILT with some cobbles/boulders			Slightly Moist	No odour or visual evidence of contamination	3.0	BH10_0.8	
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10			1.10					1.10
				Slightly Moist	No odour or visual evidence of contamination	0.6	BH10_1.15	
1.20			1.20					1.20
1.30			1.30					1.30
1.40			1.40					1.40
1.50	Terminated at depth 1.5 m		1.50					1.50
1.60			1.60					1.60

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Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **BH11**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 4/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X -12.46736° Y 130.91864°
Logged by: Stuart Carroll
Total Depth: 2.6 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S. Loose Bluish grey GRAVEL (M-C; ANG)		0.00		No odour/vis. contam.	0.5	BH11_0.0	0.00
	FILL Dense yellowish brown silty gravelly (C) SAND with some coarse asphalt gravels				No odour or visual evidence of contamination	2.3	BH11_0.03	
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30		No odour or visual evidence of contamination	2.2	BH11_0.3	0.30
0.40			0.40					0.40
0.50	FILL Hard yellowish brown gravelly (F-C) sandy SILT		0.50		No odour or visual evidence of contamination	2.2	BH11_0.5	0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00		No odour or visual evidence of contamination	1.9	BH11_1.0	1.00
1.10			1.10					1.10
1.20			1.20					1.20
1.30			1.30					1.30
1.40			1.40					1.40
1.50			1.50					1.50

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Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **BH11**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 4/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X -12.46736° Y 130.91864°
Logged by: Stuart Carroll
Total Depth: 2.6 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
1.50					No odour or visual evidence of contamination	3.7	BH11_1.5	
1.60			1.60					1.60
1.70			1.70					1.70
1.80			1.80					1.80
1.90			1.90					1.90
2.00			2.00		No odour or visual evidence of contamination	2.2	BH11_2.0	2.00
2.10	FILL Hard yellowish dark brown gravelly (F-C) sandy SILT		2.10					2.10
2.20			2.20		No odour or visual evidence of contamination		BH11_2.20	2.20
2.30			2.30					2.30
2.40			2.40					2.40
2.50			2.50					2.50
2.60	Refusal at depth 2.6 m		2.60		No odour or visual evidence of contamination	1.8	BH11_2.6	2.60
2.70			2.70					2.70
2.80			2.80					2.80
2.90			2.90					2.90
3.00			3.00					3.00

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Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **BH12**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 4/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X -12.46750° Y 130.91846°
Logged by: Stuart Carroll
Total Depth: 1.5 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S. Loose Bluish grey GRAVEL (M-C; ANG)		0.00	Dry Slightly Moist	No odour or visual evidence of contamination	2.2	BH12_0.03	0.00
0.10	FILL Dense yellowish brown silty gravelly (C) SAND with some coarse asphalt gravels		0.10					0.10
0.20	FILL Firm light brown sandy gravelly (F-M; RND-SBR) SILT		0.20	Slightly Moist	No odour or visual evidence of contamination	2.0	BH12_0.2	0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50			0.50	Slightly Moist	No odour or visual evidence of contamination	2.0	BH12_0.5	0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90	FILL Soft light brown sandy gravelly (F-M; RND-SBR) SILT		0.90					0.90
1.00			1.00	Slightly Moist	No odour or visual evidence of contamination		BH12_1.0	1.00
1.10			1.10					1.10
1.20			1.20					1.20
1.30			1.30					1.30
1.40			1.40					1.40
1.50	Terminated at depth 1.5 m		1.50	Slightly Moist	No odour or visual evidence of contamination	8.7	BH11_1.5	1.50
1.60			1.60					1.60

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **BH13**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: BerrimahFreight Terminal, East Arm, NT
Date of Invest: 5/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46736° Y = 130.91837°
Logged by: Stuart Carroll
Total Depth: 1.5 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	~~Rail line~~		0.00					0.00
	RAIL BALLAST			Slightly Moist	Stained & HC odour			
0.10			0.10					0.10
0.20			0.20					0.20
	Sandy Rail ballast			Slightly Moist	Stained & HC odour	70.6	BH13_0.25	
0.30	FILL Very stiff reddish brown gravelly (F-C) sandy SILT with some cobbles/boulders		0.30					0.30
0.40			0.40					0.40
0.50			0.50					0.50
				Slightly Moist	No odour or visual evidence of contamination	21.2	BH13_0.55	
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90	FILL Hard yellowish brown gravelly (F-C) sandy SILT		0.90	Slightly Moist	HC odour	41.1	BH13_0.90	0.90
1.00			1.00					1.00
1.10			1.10					1.10
1.20			1.20	Slightly Moist	No odour or visual evidence of contamination	26.9	BH13_1.20	1.20
	Refusal at depth 1.25 m							

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **BH14**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 5/06/2020
Client: One Rail Australia
Water Level: 3.05m
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46736° Y= 130.91833°
Logged by: Stuart Carroll
Total Depth: 3.5 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	Rail line		0.00					0.00
	Rail ballast			Slightly Moist	Stained & HC odour			
0.10			0.10					0.10
0.20			0.20					0.20
	Sandy rail ballast			Moist	Stained & faint HC odour	62.2	BH14_0.25	
0.30	FILL Very stiff reddish brown gravelly (F-C) sandy SILT with some cobbles/boulders		0.30					0.30
0.40			0.40	Slightly Moist	Faint HC odour	28.3	BH14_0.40	0.40
0.50			0.50					0.50
0.60			0.60	Slightly Moist	Faint HC odour	21.8	BH14_0.60	0.60
0.70			0.70	Slightly Moist	Faint HC odour	71.9	BH14_0.70	0.70
0.80	FILL Hard yellowish brown gravelly (F-C) sandy SILT		0.80	Moist	Faint HC odour	25.0	BH14_0.80	0.80
0.90	FILL Firm brownish yellow sandy SILT with some gravels (F-M; RND-SBR)		0.90	Moist	Faint HC odour	16.3	BH14_0.90	0.90
1.00			1.00					1.00
1.10			1.10					1.10
1.20			1.20					1.20
1.30			1.30					1.30
1.40			1.40					1.40
1.50			1.50	Moist	No odour or visual evidence of contamination	13.7	BH14_1.5	1.50
1.60			1.60					1.60
1.70			1.70					1.70
1.80			1.80					1.80
1.90			1.90					1.90
2.00			2.00					2.00

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. BH14

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 5/06/2020
Client: One Rail Australia
Water Level: 3.05 m
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46736° Y= 130.91833°
Logged by: Stuart Carroll
Total Depth: 3.5 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
2.00	FILL Firm brownish yellow sandy SILT with some gravels (F-M; RND-SBR)		2.00	Moist	Faint odour	15.0	BH14_2.0	2.00
3.00			3.00	Moist		20.6	BH14_3.0	3.00
				Wet	Water strike - 3.05 m			
3.10			3.10	Wet	No odour or visual evidence of contamination	11.8	BH14_3.1	3.10
3.50	Terminated at depth 3.5 m		3.50	Wet	No odour or visual evidence of contamination	9.0	BH14_3.5	3.50

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. BH15

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 5/06/2020
Client: One Rail Australia
Water Level: 3.05 m
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46729° Y= 130.91844°
Logged by: Stuart Carroll
Total Depth: 3.50 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	~~Rail line~~		0.00					0.00
	RAILWAY BALLAST			Slightly Moist				
0.10			0.10					0.10
0.20			0.20					0.20
	Sandy rail ballast			Moist	Stained and faint HC odour	43.3	BH15_0.25	
0.30	FILL		0.30			17.3	BH15_0.30	0.30
	Very stiff reddish brown gravelly (F-C) sandy SILT with some cobbles/boulders			Slightly Moist	Stained and faint HC odour			
0.40			0.40					0.40
0.50			0.50					0.50
0.60			0.60	Slightly Moist	No odour or visual evidence of contamination	21.8	BH15_0.60	0.60
0.70			0.70					0.70
	FILL							
0.80	Hard brownish yellow sandy SILT with some gravels (F-M; RND-SBR)		0.80	Moist	No odour or visual evidence of contamination	11.7	BH15_0.80	0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10			1.10					1.10
1.20			1.20	Slightly Moist	No odour or visual evidence of contamination		BH15_1.2	1.20
	FILL			Slightly Moist		7.7	BH15_1.25	
1.30	Firm grey to light brownish yellow sandy SILT with some gravels (F-M; RND-SBR)		1.30		No odour or visual evidence of contamination			1.30
1.40			1.40					1.40
1.50			1.50	Slightly Moist	No odour or visual evidence of contamination	7.5	BH15_1.5	1.50
1.60			1.60					1.60
1.70			1.70					1.70
1.80			1.80					1.80
1.90			1.90					1.90
2.00			2.00					2.00

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Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **BH15**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 5/06/2020
Client: One Rail Australia
Water Level: 3.05 m
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46729° Y= 130.91844°
Logged by: Stuart Carroll
Total Depth: 3.50 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
2.00	FILL Firm grey to light brownish yellow sandy SILT with some gravels (F-M; RND-SBR)		2.00	Slightly Moist	No odour or visual	6.5	BH15_2.0	2.00
2.10			2.10					2.10
2.20			2.20					2.20
2.30			2.30					2.30
2.40			2.40					2.40
2.50			2.50					2.50
2.60			2.60					2.60
2.70			2.70					2.70
2.80			2.80					2.80
2.90			2.90					2.90
3.00			3.00					3.00
3.10			3.10	Wet	Water strike - 3.05 m No odour or visual evidence of contamination	5.7	BH15_3.05	3.10
3.20			3.20					3.20
3.30			3.30					3.30
3.40			3.40					3.40
3.50	Terminated at depth 3.5 m		3.50	Moist	No odour or visual evidence of contamination	5.0	BH15_3.50	3.50
3.60			3.60					3.60
3.70			3.70					3.70
3.80			3.80					3.80
3.90			3.90					3.90
4.00			4.00					4.00

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Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **BH16**

Project Name: Diesel Spill - Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 5/06/2020
Client: One Rail Australia Pty Ltd
Water Level: 2.6 m
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46749° Y= 130.91844°
Logged by: Stuart Carroll
Total Depth: 3.0 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00					0.00
	FILL Very stiff light yellowish brown sandy gravelly (F-C) SILT			Dry	No odour or visual evidence of contamination	4.3	BH16_0.0	
0.10			0.10					0.10
0.20			0.20					0.20
	FILL Very stiff light greyish brown sandy gravelly (F-C) SILT			Slightly Moist	No odour or visual evidence of contamination	5.0	BH16_0.30	
0.30			0.30					0.30
0.40			0.40					0.40
0.50	FILL Very stiff light yellowish brown sandy gravelly (F-C) SILT		0.50	Slightly Moist	No odour or visual evidence of contamination	4.3	BH16_0.50	0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80	FILL Very stiff light yellowish brown sandy SILT with some gravels (F-C)		0.80	Slightly Moist	No odour or visual evidence of contamination	4.1	BH16_0.85	0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10			1.10					1.10
1.20			1.20	Slightly Moist	No odour or visual evidence of contamination	3.9	BH16_1.20	1.20
1.30	FILL Very stiff light yellowish brown sandy gravelly (F-C) SILT with some cobbles/ boulders		1.30					1.30
1.40			1.40	Slightly Moist	No odour or visual evidence of contamination	3.1	BH16_1.40	1.40
1.50			1.50					1.50

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Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. BH16

Project Name: Diesel Spill - Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 5/06/2020
Client: One Rail Australia Pty Ltd
Water Level: 2.6 m
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X= -12.46749° Y= 130.91844°
Logged by: Stuart Carroll
Total Depth: 3.0 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
1.60	FILL Very stiff light yellowish brown sandy gravelly (F-C) SILT with some cobbles/ boulders		1.60	Slightly Moist	No odour or visual evidence of contamination			1.60
1.70			1.70					1.70
1.80			1.80					1.80
1.90			1.90					1.90
2.00			2.00					2.00
2.10			2.10					2.10
2.20			2.20					2.20
2.30	FILL Very stiff light yellowish brown sandy gravelly (F-C) SILT		2.30					2.30
2.40			2.40	Moist	No odour or visual evidence of contamination	5.1	BH16_2.4	2.40
2.50			2.50					2.50
2.60			2.60	Wet	Water strike - 2.60 m	5.4	BH16_2.6	2.60
2.70			2.70					2.70
2.80			2.80					2.80
2.90			2.90					2.90
3.00	Refusal at depth 3.0 m		3.00	Wet	No odour or visual evidence of contamination	4.7	BH16_3.0	3.00

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. BH17

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 5/06/2020
Client: One Rail Australia
Water Level: 3.25 m
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X = -12.46748° Y = 130.91806°
Logged by: Stuart Carroll
Total Depth: 3.4 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	~~Asphalt - 0.02 m~~		0.00					0.00
	FILL Medium density brown silty gravelly (F-C) SAND			Slightly Moist	No odour or visual evidence of contamination	4.0	BH17_0.0	
0.10			0.10					0.10
	RAIL BALLAST				No odour or visual evidence of contamination			
0.20			0.20					0.20
0.30			0.30					0.30
0.40			0.40					0.40
	FILL Firm dark brown sandy (F) Gravelly (F) SILT			Slightly Moist	Moderate HC odour	9.50	BH17_0.45	
0.50			0.50					0.50
0.60			0.60					0.60
	FILL Hard brownish yellow sandy SILT with some gravels (F-M; RND-SBR)			Slightly Moist	No odour or visual evidence of contamination	5.8	BH17_0.65	
0.70			0.70					0.70
0.80			0.80					0.80
	FILL Hard brownish yellow sandy SILT with some gravels (C; RND-SBR)						BH17_0.85	
0.90			0.90					0.90
1.00			1.00					1.00
1.10			1.10					1.10
				Slightly Moist	No odour or visual evidence of contamination	4.7	BH17_1.15	
1.20			1.20					1.20
1.30			1.30					1.30
1.40			1.40					1.40
1.50			1.50					1.50
1.60			1.60					1.60
				Slightly Moist	No odour or visual evidence of contamination	4.3	BH17_1.65	
1.70			1.70					1.70
1.80			1.80					1.80
1.90			1.90					1.90
2.00			2.00					2.00

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Going Further in Managing Risk

ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **BH17**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 5/06/2020
Client: One Rail Australia
Water Level: 3.25 m
Drilling method: Solid Auger
Lot No.: NA
Coordinates: X = -12.46748° Y = 130.91806°
Logged by: Stuart Carroll
Total Depth: 3.4 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
2.10	FILL Hard brownish yellow sandy SILT with some gravels (C; RND-SBR) and some cobbles/boulders		2.10					2.10
2.20			2.20					2.20
2.30			2.30					2.30
2.40	FILL Firm brownish yellow sandy SILT with some gravels (C; RND-SBR)		2.40	Slightly Moist	No odour or visual evidence of contamination	5.1	BH17_2.40	2.40
2.50			2.50					2.50
2.60			2.60					2.60
2.70			2.70					2.70
2.80			2.80					2.80
2.90			2.90					2.90
3.00			3.00					3.00
3.10			3.10					3.10
3.20			3.20	Wet	Water strike - 3.25 m			3.20
3.30			3.30		No odour or visual evidence of contamination			3.30
3.40	Terminated at depth 3.4 m		3.40	Wet	No odour or visual evidence of contamination	5.3	BH17_3.4	3.40
3.50			3.50					3.50
3.60			3.60					3.60
3.70			3.70					3.70
3.80			3.80					3.80
3.90			3.90					3.90
4.00			4.00					4.00

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **NDTP01**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 10/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Non Destructive
Lot No.: NA
Coordinates: X=-12.46777 Y= 130.91720
Logged by: Stuart Carroll
Total Depth: 0.6 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00					0.00
	FILL Stiff greyish brown sandy gravelly (F-M) SILT				No odour or visual evidence of contamination	1.5	NDTP01_0.0	
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50			0.50		No odour or visual evidence of contamination	0.0	NDTP01_0.5	0.50
0.60	Terminated at depth 0.6 m		0.60		Power line 0.60 m			0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. NDTP02

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 10/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Non Destructive
Lot No.: NA
Coordinates: X=-12.46779° Y= 130.91751°
Logged by: Stuart Carroll
Total Depth: 0.6 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S. FILL Stiff greyish brown sandy gravelly (F-M) SILT		0.00		No odour or visual evidence of contamination	0.0		0.00
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50			0.50		No odour or visual evidence of contamination	0.0	NDTP02_0.5	0.50
0.60	Terminated at depth 0.6 m		0.60		Power line 0.60 m			0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. NDTP03

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 10/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Non Destructive
Lot No.: NA
Coordinates: X=-12.46766° Y= 130.91785°
Logged by: Stuart Carroll
Total Depth: 0.6 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S. FILL Stiff light orangey brown sandy gravelly (F-M) SILT		0.00		No odour or visual evidence of contamination	0.1	NDTP03_0.0	0.00
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50	Loose light yellowish white SAND (M)		0.50		No odour or visual evidence of contamination Power line 0.55 m	0.1	NDTP03_0.5	0.50
	Terminated at depth 0.55 m							
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. NDTP04

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 10/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Non Destructive
Lot No.: NA
Coordinates: X=-12.46775° Y= 130.91777°
Logged by: Stuart Carroll
Total Depth: 0.80m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00					0.00
	FILL Stiff light orangey brown sandy gravelly (F-M) SILT				No odour or visual evidence of contamination	0.0	NDTP04_0.0	
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50			0.50					0.50
0.60	Loose light yellowish white SAND (M)		0.60		No odour or visual evidence of contamination	0.0	NDTP04_0.6	0.60
	Terminated at depth 0.80 m				Power line 0.65 m			
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. NDTP05

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 10/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Non Destructive
Lot No.: NA
Coordinates: X=-12.46741° Y= 130.91753°
Logged by: Stuart Carroll
Total Depth: 1.1 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S. FILL Very stiff orangey brown sandy gravelly SILT with some cobbles		0.00		No odour or visual evidence of contamination	0.1		0.00
0.10			0.10					0.10
0.20			0.20		HC odour	80.1	NDTP05_0.2	0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50			0.50		Sheen in TP water	76.8		0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80			109		0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10	Terminated at depth 1.10 m		1.10		Sheen in NDTP water Power line 1.1 m			1.10
1.20			1.20					1.20

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **NDTP06**

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 10/06/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Non Destructive
Lot No.: NA
Coordinates: X=-12.46728° Y= 130.91884°
Logged by: Stuart Carroll
Total Depth: 1.1 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S. FILL Very stiff orangey brown sandy gravelly SILT with some cobbles		0.00		No odour or visual evidence of contamination	0.0	NDTP06_0.0	0.00
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
0.40			0.40		No odour or visual evidence of contamination	0.0	NDTP06_0.35	0.40
0.50			0.50					0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90		No odour or visual evidence of contamination	0.0		0.90
1.00	Terminated at depth 1.0 m		1.00		Power line 1.0 m			1.00
1.10			1.10					1.10
1.20			1.20					1.20

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. NDTP07

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 16/07/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Non Destructive
Lot No.: NA
Coordinates: X= -12.46748° Y= 130.91833°
Logged by: Stuart Carroll
Total Depth: 1.1 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00					0.00
	FILL Very stiff orangey brown sandy gravelly SILT with some cobbles				No odour or visual evidence of contamination	0.1		
0.10			0.10					0.10
0.20			0.20		HC odour	42.1		0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50			0.50		HC odour	73.3		0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90		HC odour	59		0.90
1.00	Loose light yellowish white SAND (M)		1.00		Power line 1.0 m			1.00
1.10	Terminated at depth 1.10 m		1.10		HC odour	111	NDTP07 (1.1)	1.10
1.20			1.20					1.20

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. NDTP08

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 16/07/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Non Destructive
Lot No.: NA
Coordinates: X = -12.46754° Y = 130.91809°
Logged by: Stuart Carroll
Total Depth: 1.1 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00					0.00
	FILL Very stiff orangey brown sandy gravelly SILT with some cobbles				No odour or visual evidence of contamination	0.0		
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
0.40			0.40					0.40
					No odour or visual evidence of contamination	0.1		
0.50			0.50					0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
					No odour or visual evidence of contamination Power line 1.0 m	0.0		
1.00	Loose light yellowish white SAND (M)		1.00					1.00
						1.1	NDTP08 (1.1)	
1.10	Terminated at depth 1.10 m		1.10					1.10
1.20			1.20					1.20

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. NDTP09

Project Name: Diesel Spill – Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 16/07/2020
Client: One Rail Australia
Water Level: NA
Drilling method: Non Destructive
Lot No.: NA
Coordinates: X= -12.46778° Y = 130.91764°
Logged by: Stuart Carroll
Total Depth: 0.35 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00					0.00
	FILL Very stiff orangey brown sandy gravelly SILT with some cobbles				HC odour	40.1		
0.10			0.10					0.10
0.20			0.20		Power line 0.25			0.20
	Loose light yellowish white SAND (M)				HC odour	88.6	NDTP09 (0.3)	
0.30			0.30					0.30
	Terminated at depth 0.35 m							
0.40			0.40					0.40
0.50			0.50					0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00					1.00
1.10			1.10					1.10
1.20			1.20					1.20

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ENVIRONMENTAL LOG
TEST PIT

TEST PT No. **NDTP10**

Project Name: Diesel Spill - Detailed Site Investigation
Project No.: J168829
Location: Berrimah Freight Terminal, East Arm, NT
Date of Invest: 16/07/2020
Client: One Rail Australia Pty Ltd
Water Level: NA
Drilling method: Non Destructive
Lot No.: NA
Coordinates: X= -12.46779° Y = 130.91750°
Logged by: Stuart Carroll
Total Depth: 1.5 m
Checked by: Robin Birua

Depth (m)	Material Description	Graphic log	Depth (m)	Moisture Content	Other Observations (eg.Stains/Odours)	PID Headspace	Sample Details	Depth (m)
0.00	G.S.		0.00					0.00
	FILL Very stiff orangey brown sandy gravelly SILT with some cobbles and boulders				No odour or visual evidence of contamination	0.3		
0.10			0.10					0.10
0.20			0.20					0.20
0.30			0.30					0.30
0.40			0.40					0.40
0.50			0.50		No odour or visual evidence of contamination	0.0		0.50
0.60			0.60					0.60
0.70			0.70					0.70
0.80			0.80					0.80
0.90			0.90					0.90
1.00			1.00		No odour or visual evidence of contamination	0.9		1.00
1.10			1.10					1.10
1.20			1.20					1.20
1.30			1.30					1.30
1.40			1.40		No odour or visual evidence of contamination	0.1	NDTP10 (1.5)	1.40
1.50	Terminated at depth 1.50 m		1.50		Fire Water 1.5 m			1.50

DRAFT

ECO Environmental

Environmental monitoring
& sampling equipment
Rentals and sales.

Tel: +61 8 9328 2900
fax: +61 8 9328 2677
eco@ecoenvironmental.com.au
www.ecoenvironmental.com.au
214 Lord St Perth WA 6000

Equipment Information

Instrument: MRPID 8B QLD
Serial Number: #911605

Equipment Check

	Enclosed	Returned	Comments
MiniRae PID Pump	☑	☐	
Protective Boot	☑	☐	
Metal Belt Clip	☑	☐	
Charger	☑	☐	
Rae Software	☑	☐	
Download Cable	☑	☐	
Instrument Manual	☑	☐	
Water Trap Filter (x2)	☑	☐	1 x unpacked, 1 x packed
Laminated Field Sheet	☑	☐	
Storm Carry Case	☑	☐	

Additional Items Enclosed

Humidity Filter + Adaptor	☒	☐	
Alkaline Battery Pack	☒	☐	Requires 4 AA Batteries (not included)

Sensor Calibration Details

	Pass	Fail	Comment
Lamp 10.6eV – Fresh Air Cal	☑	☐	
Lamp 10.6eV – Isobutylene Gas 100ppm	☑	☐	Lot / Cyl

Alarm Limits

Alarm – Audible/ Visual	☑	☐
Alarm – Low 50ppm	☑	☐
Alarm – High 100ppm	☑	☐

Inspection Details

Inspection for faults, corrosion, damage	☑	☐
Deleted all previously logged data	☑	☐
Correction factor set to 1.00	☑	☐
Peak has been reset	☑	☐
No moisture on lamp	☑	☐

This is to certify that where possible, this instrument has been calibrated in accordance with the manufacturer's calibration procedure. ECO Standard Rental Terms and Conditions apply to all equipment calibrations.

Regards

Dave McGraw 21/5/20

Equipment Specialist
ECO Environmental Pty Ltd

DRAFT

ECO Environmental

Environmental monitoring
& sampling equipment
Rentals and sales.

Tel: +61 8 9328 2900
fax: +61 8 9328 2677
eco@ecoenvironmental.com.au
www.ecoenvironmental.com.au
214 Lord St Perth WA 6000

Equipment Information

Instrument: MRPIDLite 1P
Serial Number: #595-001092

Equipment Check

	Enclosed	Returned	Comments
MiniRae PID Pump	☑	☐	
Protective Boot	☑	☐	
Spare battery pack + star driver	☑	☐	
Charger	☑	☐	
2 x Humidity Filters & 1 x Tube adaptor	☑	☐	
Download Cable	☑	☐	
Instrument Manual	☑	☐	
Water Trap Filter (x2)	☑	☐	
Laminated Field Sheet	☑	☐	
Carry Case	☑	☐	

Additional Items Enclosed

	☐	☐
	☐	☐

Sensor Calibration Details

	Pass	Fail	Comment
Lamp 10.6eV – Fresh Air Cal	☑	☐	
Lamp 10.6eV – Isobutylene Gas 100ppm	☑	☐	Lot 827585 / Cyl

Alarm Limits

Alarm – Audible/ Visual	☑	☐
Alarm – Low 50ppm	☑	☐
Alarm – High 100ppm	☑	☐

Inspection Details

Inspection for faults, corrosion, damage	☑	☐
Deleted all previously logged data	☑	☐
Correction factor set to 1.00	☑	☐
Peak has been reset	☑	☐

This is to certify that where possible, this instrument has been calibrated in accordance with the manufacturer's calibration procedure. ECO Standard Rental Terms and Conditions apply to all equipment calibrations.

Regards

Dave McGraw 24/6/20

Equipment Specialist
ECO Environmental Pty Ltd

DRAFT

ECO Environmental

Environmental monitoring & sampling equipment Rentals and sales.

Tel: +61 8 9328 2900
fax: +61 8 9328 2677
eco@ecoenvironmental.com.au
www.ecoenvironmental.com.au
214 Lord St Perth WA 6000

Equipment Information

Instrument: MRPIDLite 1P
Serial Number: #595-001092

Equipment Check

	Enclosed	Returned	Comments
MiniRae PID Pump	☑	☐	
Protective Boot	☑	☐	
Spare battery pack + star driver	☑	☐	
Charger	☑	☐	
2 x Humidity Filters & 1 x Tube adaptor	☑	☐	
Download Cable	☑	☐	
Instrument Manual	☑	☐	
Water Trap Filter (x2)	☑	☐	
Laminated Field Sheet	☑	☐	
Carry Case	☑	☐	

Additional Items Enclosed

	☐	☐	
	☐	☐	

Sensor Calibration Details

	Pass	Fail	Comment
Lamp 10.6eV – Fresh Air Cal	☑	☐	
Lamp 10.6eV – Isobutylene Gas 100ppm	☑	☐	Lot 825182 Cyl 1

Alarm Limits

Alarm – Audible/ Visual	☑	☐
Alarm – Low 50ppm	☑	☐
Alarm – High 100ppm	☑	☐

Inspection Details

Inspection for faults, corrosion, damage	☑	☐
Deleted all previously logged data	☑	☐
Correction factor set to 1.00	☑	☐
Peak has been reset	☑	☐

This is to certify that where possible, this instrument has been calibrated in accordance with the manufacturer's calibration procedure. ECO Standard Rental Terms and Conditions apply to all equipment calibrations.

Regards

Dave McGraw 25/9/20

Equipment Specialist
ECO Environmental Pty Ltd

DRAFT

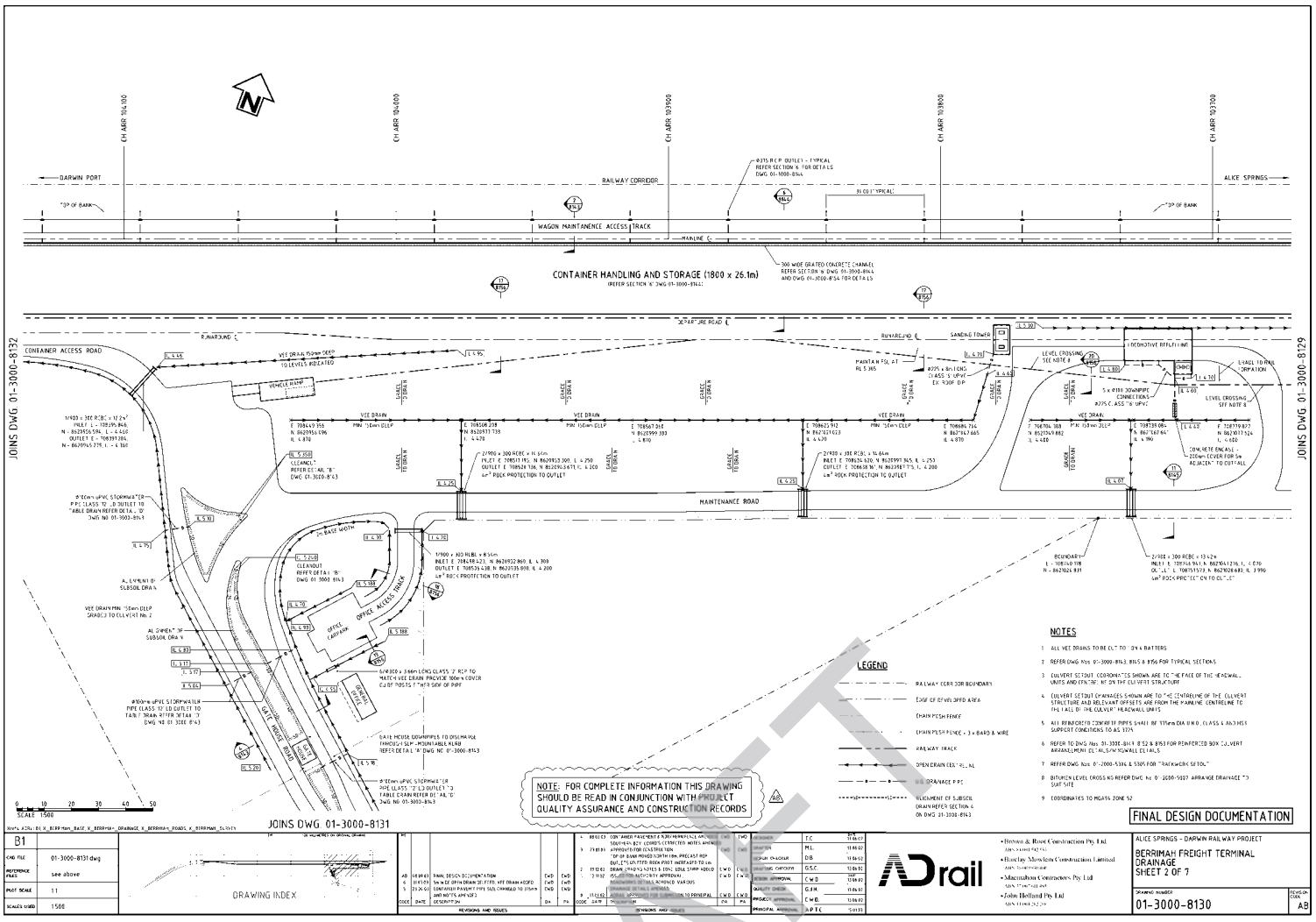
Diesel Spill – Detailed Site Investigation

One Rail Australia

Berrimah Freight Terminal, Export Drive, Berrimah NT

Appendix B DESIGNS – COMPACTED FILL

DRAFT



DRAFT

CAD FILE	01-3000-8131.dwg
REFERENCE FILES	see above
PLOT SCALE	1:1
SCALES USED	1:500

CODE	DATE	DESCRIPTION	DA	PA
AB	08.09.03	FINAL DESIGN DOCUMENTATION	CWD	CWD
5	08.07.03	5m W OF OPEN DRAIN SET TO, VEE DRAIN ADDED	CWD	CWD
4	21.04.03	CONTAINER PAVEMENT TYPE SUB-CHANGED TO 315mm 2600 MOTTS APPROVED	CWD	CWD

DESIGNER	M.L.	11.06.03	
DRAFTER	D.B.	11.06.03	
DESIGN CHECKER	G.S.C.	11.06.03	
DRAWING APPROVAL	C.W.D.	11.06.03	
DESIGN APPROVAL	G.H.	11.06.03	
QUALITY CHECK	C.W.D.	11.06.03	
PROJECT APPROVAL	APTC	11.06.03	

- Brown & Root Construction Pty Ltd ABN 91 094 642 553
- Barclay Mowlem Construction Limited ABN 30 009 539 460
- Macmahon Contractors Pty Ltd ABN 27 007 674 479
- John Holland Pty Ltd ABN 11 004 282 268

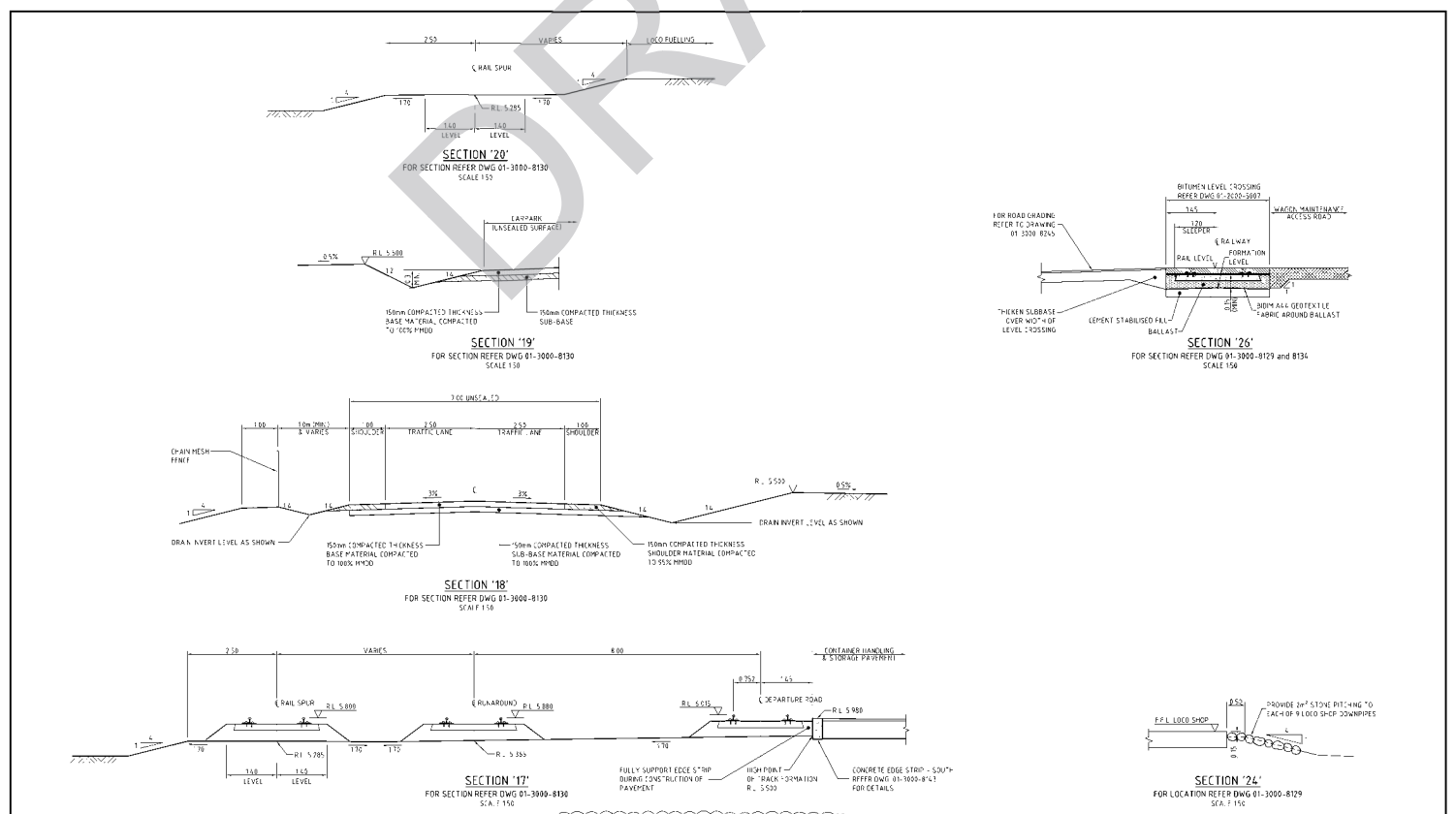
ALICE SPRINGS - DARWIN RAILWAY PROJECT

BERRIMAH FREIGHT TERMINAL DRAINAGE SHEET 2 OF 7

DRAWING NUMBER: 01-3000-8130

REVISION CODE: AB

C:\Drafting\Drawings\Permanent_Facilities\01-3000-8130 Rev AB.dwg, 12/09/2003 01:39:55 PM, GHepworth



NOTE: FOR COMPLETE INFORMATION THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH PROJECT QUALITY ASSURANCE AND CONSTRUCTION RECORDS

NOTES

1 TO BE READ IN CONJUNCTION WITH DWG Nos 01-3000-8143 & 8145

FINAL DESIGN DOCUMENTATION

CAD FILE	01-3000-8156.DWG
REFERENCE FILES	
PLOT SCALE	1:1 AT A1
SCALES USED	AS INDICATED

CODE	DATE	DESCRIPTION	DA	PA
AB	08.09.03	FINAL DESIGN DOCUMENTATION	CWD	CWD
5	08.07.03	SECTION 17 UPDATED, SECTION 25 DELETED AND SECTION 24 AMENDED	CWD	CWD
2	23.01.03	APPROVED FOR CONSTRUCTION	CWD	CWD
1	15.12.02	SECTION 01 RAILS AMENDED SECTION 25 ADDED ADRAIL APPROVED FOR SUBMISSION TO PRINCIPAL	CWD	CWD
0	27.11.02	ADRAIL APPROVED FOR AUTHORITY APPROVAL	CWD	CWD
A	07.08.02	ISSUED FOR COMMENT		

DESIGNER	R.S.W.	12.11.02	
DRAFTER	M.J.V.	JUNE 02	
DESIGN CHECKER	C.W.D.	12.11.02	
DRAWING CHECKER	G.S.C.	12.11.02	
DESIGN APPROVAL	C.W.D.	12.11.02	
QUALITY CHECK	G.H.	12.11.02	
PROJECT APPROVAL	C.W.D.	12.11.02	
PRINCIPAL APPROVAL	APTC	15.01.03	

- Brown & Root Construction Pty Ltd ABN 91 094 642 553
- Barclay Mowlem Construction Limited ABN 30 009 539 460
- Macmahon Contractors Pty Ltd ABN 27 007 674 479
- John Holland Pty Ltd ABN 11 004 282 268

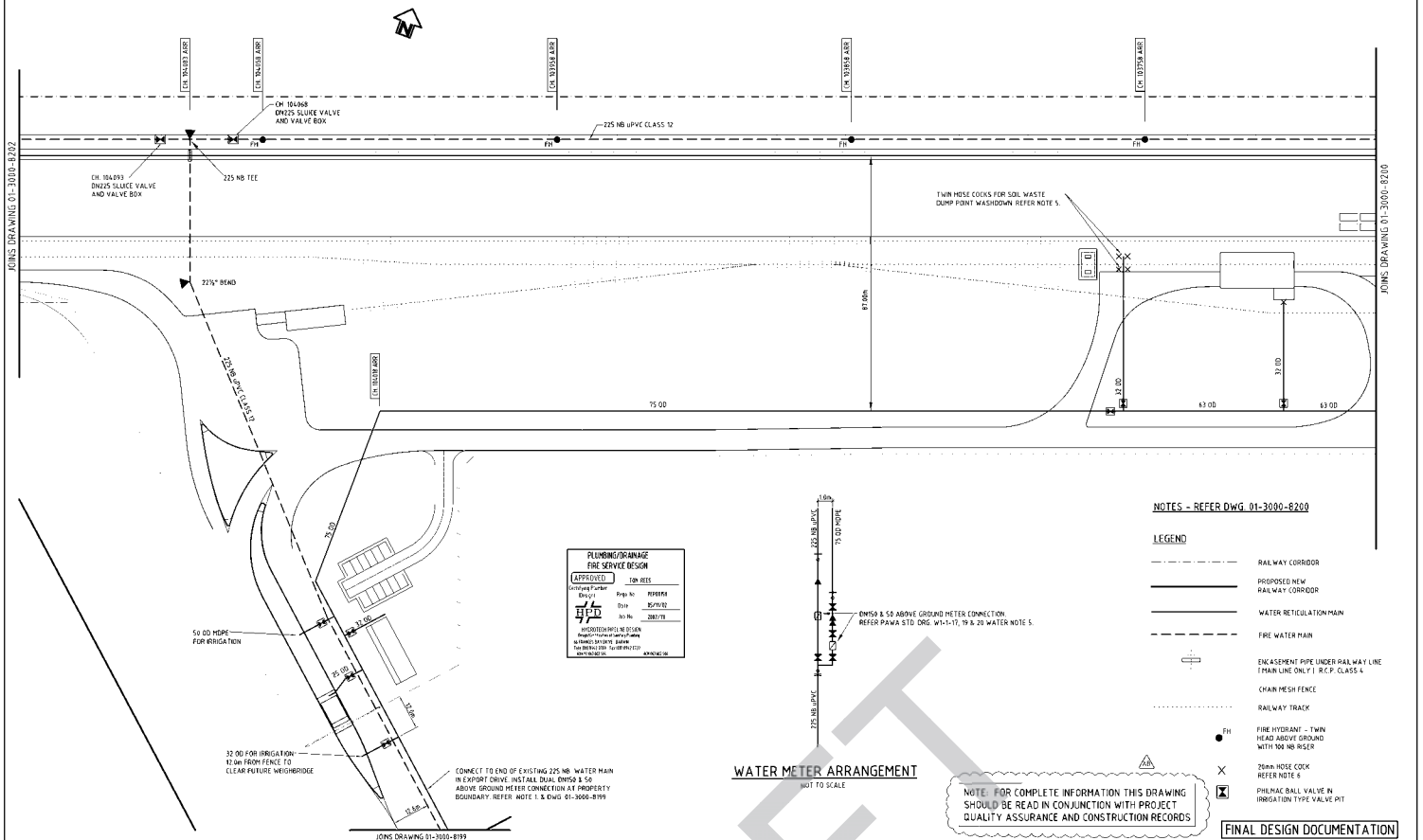
ALICE SPRINGS - DARWIN RAILWAY PROJECT

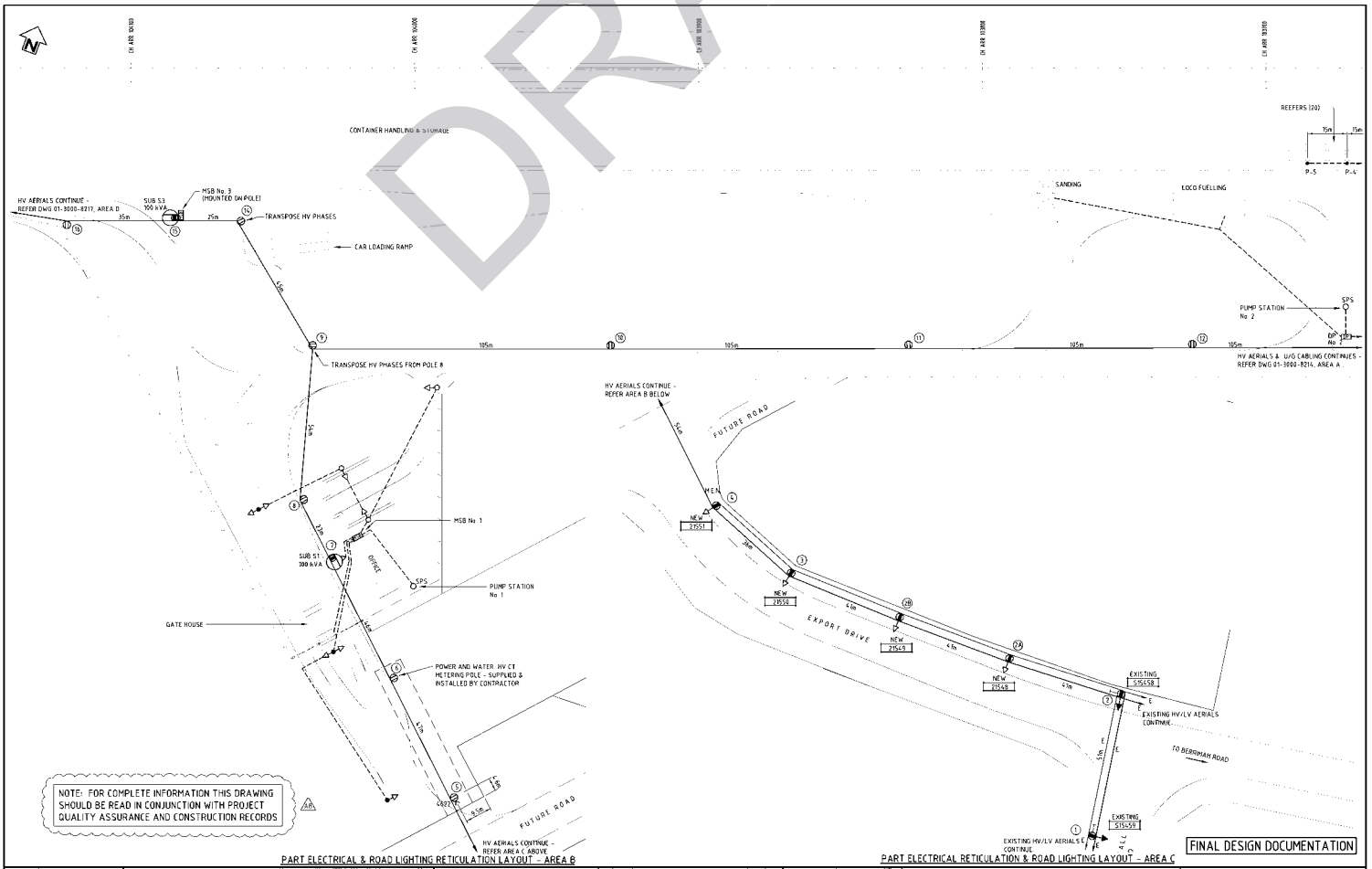
BERRIMAH FREIGHT TERMINAL TYPICAL SECTIONS SHEET 3 OF 3

DRAWING NUMBER: 01-3000-8156

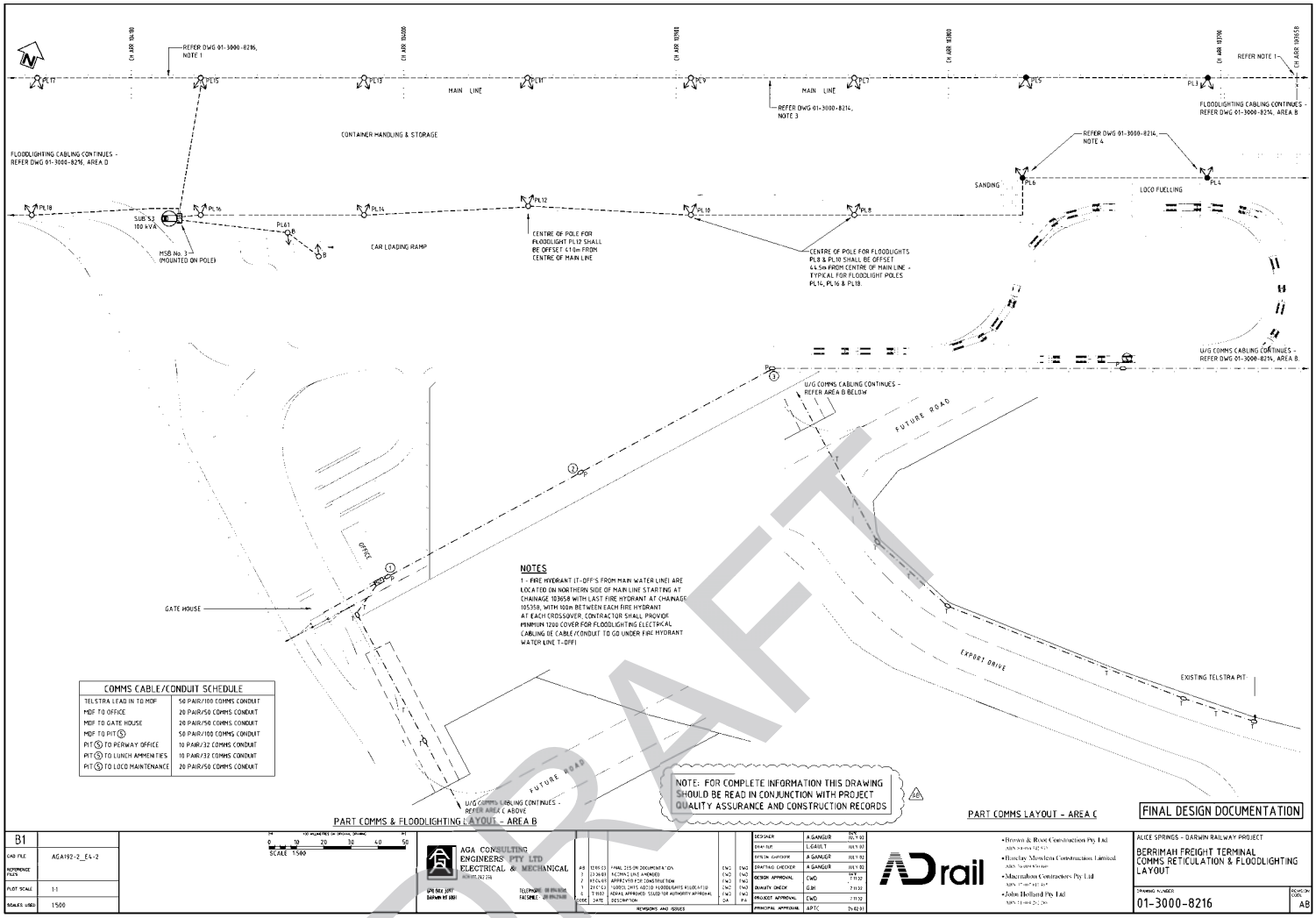
REVISION CODE: AB

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JOINS DRAWING 01-3000-8202
JOINS DRAWING 01-3000-8200
CH. 104060 ARR
CH. 104108 ARR
CH. 103958 ARR
CH. 103858 ARR
CH. 103758 ARR
CH. 104068 DN225 SLUICE VALVE AND VALVE BOX
CH. 104093 DN225 SLUICE VALVE AND VALVE BOX
225 NB uPVC CLASS 12
225 NB TEE
22½° BEND
TWIN HOSE COCKS FOR SOIL WASTE DUMP POINT WASHDOWN REFER NOTE 5.
87.08m
75 OD
63 OD
32 OD
50 OD HDPE FOR IRRIGATION
32 OD FOR IRRIGATION
12.6m
CONNECT TO END OF EXISTING 225 NB WATER MAIN IN EXPORT DRIVE. INSTALL DUAL DN150 & 50 ABOVE GROUND METER CONNECTION AT PROPERTY BOUNDARY. REFER NOTE 1. & DWG 01-3000-8199
JOINS DRAWING 01-3000-8199
SCALE 1:500
PLUMBING/DRAINAGE FIRE SERVICE DESIGN
APPROVED
TOM REES
HPD
Reqn No 19208158
Date 15/11/02
Job No 2002178
HYDROTECH PIPELINE DESIGN
WATER METER ARRANGEMENT
NOT TO SCALE
DN150 & 50 ABOVE GROUND METER CONNECTION. REFER PAWA STD DRG. W1-1-17, 19 & 20 WATER NOTE 5.
NOTES - REFER DWG 01-3000-8200
LEGEND
RAILWAY CORRIDOR
PROPOSED NEW RAILWAY CORRIDOR
WATER RETICULATION MAIN
FIRE WATER MAIN
ENCASEMENT PIPE UNDER RAILWAY LINE (MAIN LINE ONLY) R.C.P. CLASS 4
CHAIN MESH FENCE
RAILWAY TRACK
FH FIRE HYDRANT - TWIN HEAD ABOVE GROUND WITH 100 NB RISER
20mm HOSE COCK REFER NOTE 8
PHILMAC BALL VALVE IN IRRIGATION TYPE VALVE PIT
NOTE: FOR COMPLETE INFORMATION THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH PROJECT QUALITY ASSURANCE AND CONSTRUCTION RECORDS
FINAL DESIGN DOCUMENTATION
B1
CAD FILE 01-3000-8201.dwg
REFERENCE FILES
PLOT SCALE 1:1
SCALES USED AS SHOWN
AR 12.11.03 Final Design Documentation
6 27.06.03 Sluice Valves Added
5 14.05.03 Amendments as Shown
4 11.12.02 Approved for Construction
3 27.02.02 Approved for Construction Provisional
2 07.02.02 Issued for Authority Approval
1 07.11.01 Issued for Authority Approval
CODE DATE DESCRIPTION DR PA
REVISIONS AND ISSUES
DESIGNER R.J.S 12.11.02
DRAWN Q.R 12.11.02
DESIGN CHECKER S.W 12.11.02
DRAFTING CHECKER R.J.S 12.11.02
DESIGN APPROVAL CWD 12.11.02
QUALITY CHECK G.H 12.11.02
PROJECT APPROVAL CWD 12.11.02
PRINCIPAL APPROVAL AJPTC 07.12.03
Drail
• Brown & Root Construction Pty Ltd
• Barclay Mowlem Construction Limited
• Macmahon Contractors Pty Ltd
• John Holland Pty Ltd
ALICE SPRINGS - DARWIN RAILWAY PROJECT
BERRIMAH FREIGHT TERMINAL
WATER SUPPLY & FIRE SERVICES
LAYOUT PLAN
SHEET 2 OF 4
DRAWING NUMBER 01-3000-8201
REVISION CODE AB


CH 103300
CH 103200
CH 103100
CH 103000
CH 102900
CONTAINER HANDLING & STORAGE
REEFERS (20)
HV AERIALS CONTINUE - REFER DWG 01-3000-8217, AREA D
SUB S3 100 kVA
MSB No. 3 (MOUNTED ON POLE)
TRANSPOSE HV PHASES
CAR LOADING RAMP
SANDING
LOCO FUELLING
PUMP STATION No. 2
SPS
HV AERIALS & U/G CABLING CONTINUES - REFER DWG 01-3000-8214, AREA A
TRANSPOSE HV PHASES FROM POLE 8
HV AERIALS CONTINUE - REFER AREA B BELOW
FUTURE ROAD
MSB No. 1
SUB S1 200 kVA
OFFICE
PUMP STATION No. 1
GATE HOUSE
POWER AND WATER HV CT METERING POLE - SUPPLIED & INSTALLED BY CONTRACTOR
NEW 2955T
NEW 2958
NEW 2954
NEW 2954
EXPORT DRIVE
EXISTING 515658
EXISTING HV/LV AERIALS CONTINUE
TO BERRIMAH ROAD
EXISTING 515659
EXISTING HV/LV AERIALS CONTINUE
NOTE: FOR COMPLETE INFORMATION THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH PROJECT QUALITY ASSURANCE AND CONSTRUCTION RECORDS
PART ELECTRICAL & ROAD LIGHTING RETICULATION LAYOUT - AREA B
PART ELECTRICAL RETICULATION & ROAD LIGHTING LAYOUT - AREA C
FINAL DESIGN DOCUMENTATION
B1
CAD FILE AGA192-2E3
REFERENCE FILES
PLOT SCALE 1:1
SCALES USED 1:500
SCALE 1:500
AGA CONSULTING ENGINEERS PTY LTD
ELECTRICAL & MECHANICAL
ACN 078 262 276
GPO BOX 3697 DARWIN NT 0801
TELEPHONE 08 8941 0582
FACSIMILE 08 8941 2540
AR 12.11.03 Final Design Documentation CWD CWD
6 11.07.03 Pole Spacing Adjacent Poles & Offsets Added CWD CWD
3 12.06.03 Poles 1 to 7 Amended, Street Lights Added CWD CWD
2 07.04.03 Approved for Construction CWD CWD
1 21.01.03 Pole Terminations Cables Added, Pole Heights Amended CWD CWD
0 7.11.02 Initial Approvals Issued for Authority Approval CWD CWD
CODE DATE DESCRIPTION DR PA
REVISIONS AND ISSUES
DESIGNER A.GANGUR JULY 02
DRAWN R. GAULT JULY 02
DESIGN CHECKER A.GANGUR JULY 02
DRAFTING CHECKER A.GANGUR JULY 02
DESIGN APPROVAL CWD 7.11.02
QUALITY CHECK G.H 7.11.02
PROJECT APPROVAL CWD 7.11.02
PRINCIPAL APPROVAL
Drail
• Brown & Root Construction Pty Ltd
• Barclay Mowlem Construction Limited
• Macmahon Contractors Pty Ltd
• John Holland Pty Ltd
ALICE SPRINGS - DARWIN RAILWAY PROJECT
BERRIMAH FREIGHT TERMINAL
ELECTRICAL RETICULATION & ROAD LIGHTING LAYOUT
DRAWING NUMBER 01-3000-8215
REVISION CODE AB

DRAFT



NOTES

1 - FIRE HYDRANT IT-OFF'S FROM MAIN WATER LINE) ARE LOCATED ON NORTHERN SIDE OF MAIN LINE STARTING AT CHAINAGE 103658 WITH LAST FIRE HYDRANT AT CHAINAGE 105358, WITH 100m BETWEEN EACH FIRE HYDRANT AT EACH CROSSOVER, CONTRACTOR SHALL PROVIDE MINIMUM 1200 COVER FOR FLOODLIGHTING ELECTRICAL CABLING OR CABLE/CONDUIT TO GO UNDER FIRE HYDRANT WATER LINE T-OFF!

COMMS CABLE/CONDUIT SCHEDULE	
TELSTRA LEAD IN TO MDF	50 PAIR/100 COMMS CONDUIT
MDF TO OFFICE	20 PAIR/50 COMMS CONDUIT
MDF TO GATE HOUSE	20 PAIR/50 COMMS CONDUIT
MDF TO PIT (S)	50 PAIR/100 COMMS CONDUIT
PIT (S) TO PERWAY OFFICE	10 PAIR/32 COMMS CONDUIT
PIT (S) TO LUNCH AMMENITIES	10 PAIR/32 COMMS CONDUIT
PIT (S) TO LOCO MAINTENANCE	20 PAIR/50 COMMS CONDUIT

NOTE: FOR COMPLETE INFORMATION THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH PROJECT QUALITY ASSURANCE AND CONSTRUCTION RECORDS

PART COMMS & FLOODLIGHTING LAYOUT - AREA B

PART COMMS LAYOUT - AREA C

FINAL DESIGN DOCUMENTATION

B1

CAD FILE: AGA192-2_E4-2

REFERENCE FILES:

PLOT SCALE: 1:1

SCALES USED: 1:500

SCALE 1:500

AGA CONSULTING ENGINEERS PTY LTD
ELECTRICAL & MECHANICAL
ACN 072 232 238
GPO Box 2697
Darwin NT 0801
TELEPHONE (08) 8941 8700
FACSIMILE (08) 8941 7400

CODE	DATE	DESCRIPTION	DA	PA
AB	12.05.03	FINAL 25% DOCUMENTATION	EWC	EWC
1	23.04.03	ACOMA LINE AMENDED	EWC	EWC
2	11.04.03	APPROVED FOR CONSTRUCTION	EWC	EWC
1	21.01.03	100KVA UNIT ADDED TO BOOMGATE BUILDING	EWC	EWC
A	7.11.02	ISSUED APPROVED ISSUED FOR AUTHORITY APPROVAL	EWC	EWC

REVISIONS AND ISSUES

DESIGNER	A GANGUR	30.7.02
DRAFTSP	L.GAULT	30.7.02
DESIGN CHECKER	A GANGUR	30.7.02
DRAFTING CHECKER	A GANGUR	30.7.02
DESIGN APPROVAL	CWD	7.11.02
QUALITY CHECK	GJH	7.11.02
PROJECT APPROVAL	CWD	7.11.02
PRINCIPAL APPROVAL	APTC	26.02.03

ADrail

- Brown & Root Construction Pty Ltd
- Barclay Mowlem Construction Limited
- Macmahon Contractors Pty Ltd
- John Holland Pty Ltd

ALICE SPRINGS - DARWIN RAILWAY PROJECT

BERRIMAH FREIGHT TERMINAL COMMS RETICULATION & FLOODLIGHTING LAYOUT

DRAWING NUMBER: 01-3000-8216

REVISION NUMBER: AB

DRAFT

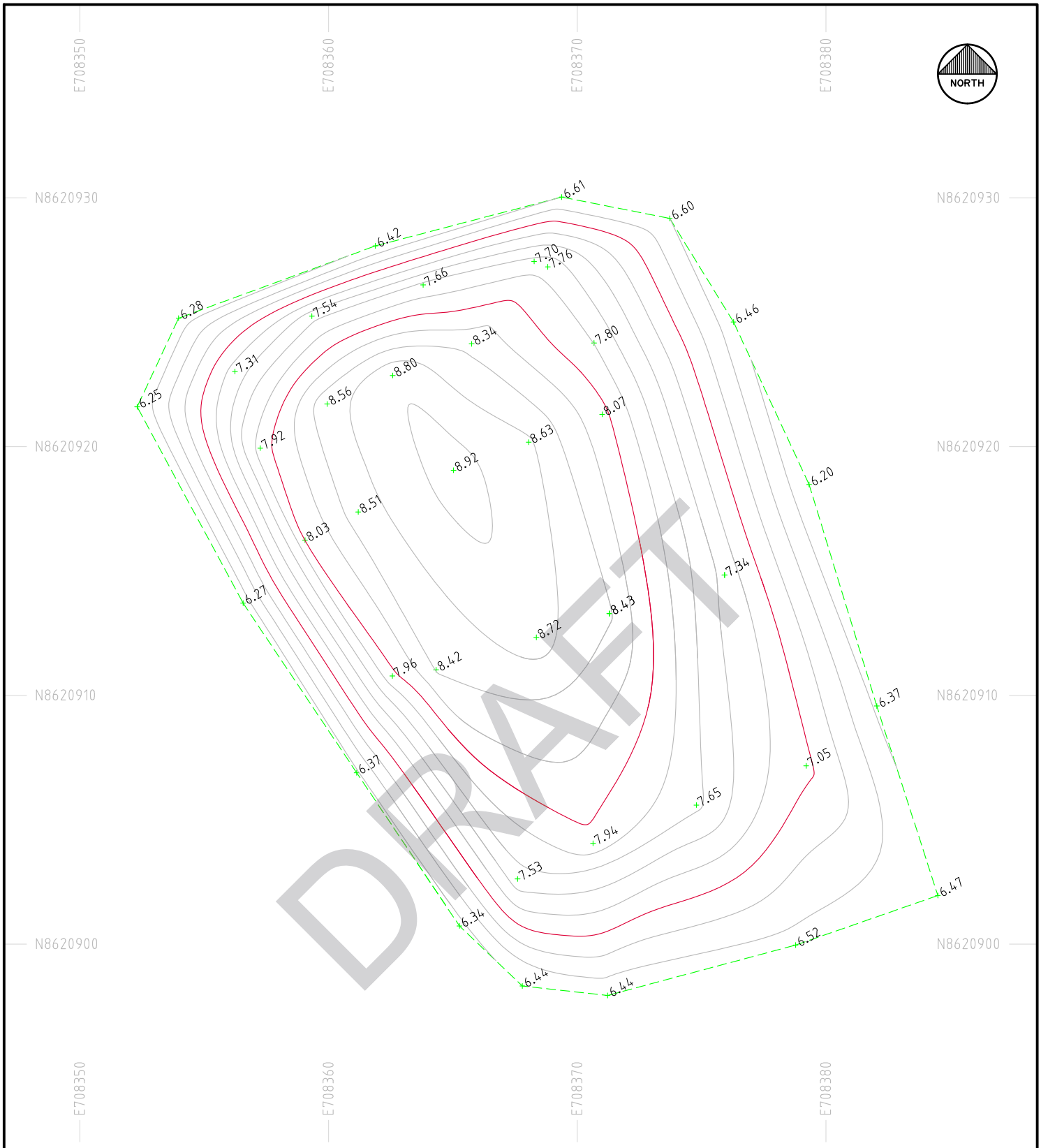
Diesel Spill – Detailed Site Investigation

One Rail Australia

Berrimah Freight Terminal, Export Drive, Berrimah NT

Appendix C STOCKPILE SURVEY

DRAFT



FYFE
HEAD OFFICE
Lvl 2, 124 Sth Terrace
Adelaide SA 5000
GPO Box 2450
Adelaide SA 5001
www.fyfe.com.au

PROJECT OFFICE
T412, Building 4, Lvl 1
631 Stuart Highway
PO Box 1726
Berrimah NT 0828
Telephone 61 8 8944 7888

ECAAS ISO 9001 CERTIFIED QUALITY MANAGEMENT

LEGEND

INDEX CONTOUR (1m INTERVAL)
CONTOUR (0.2m INTERVAL)
NATURAL SURFACE

VOLUME = 795m³

0 3 6 9 12 15

SCALE 1: 150

LEVEL DATUM :	AHD	DATE OF SURVEY :	11/02/2021
LEVEL AUTHORITY :	CRM S97185066	SURVEYOR:	TSJ
CO-ORD DATUM :	MGA94 (ZONE 52)	TITLE REF:	N/A

ONE RAIL AUSTRALIA PTY LTD

VOLUME SURVEY
CONTAMINATED STOCKPILE
BERRIMAH TERMINAL, O'SULLIVAN CIRCUIT
EAST ARM

DRAWING: 73488-2-SV-TO01-r0.dwg

INSTRUCTION	73488-2
DATE	12/02/2021
SHEET	1 OF 1
REV.	0

ORIGINAL SIZE A3

FILE PATH: \\FYFE07.COM.AU\LOCAL\PROJECTS\DARWIN\70000\73000\73488\73488-2 BERRIMAH TERMINAL\09_CAD\0901_SUDT\090101_DRAWINGS\73488-2-SV-TO01-R0.DWG

Diesel Spill – Detailed Site Investigation

One Rail Australia

Berrimah Freight Terminal, Export Drive, Berrimah NT

Appendix D LABORATORY CERTIFICATES – SOIL

DRAFT

CHAIN OF CUSTODY RECORD

Eurofins | mgt 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 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**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Greencap NT P/L
Address	11/14 Winnellie Road, Winnellie, NT, 0800
Contact Name	Stuart Carroll
Phone №	0466 776 038
Special Directions	
Purchase Order	
Quote ID №	

Project №	J168829
Project Name	One Rail - Diesel Spill Investigation
Project Manager	Stuart Carroll
EDD Format (ESdat, EQuIS etc)	
Sampler(s)	Staurt Carroll & Robin Birua
Handed over by	N/A
Email for Results	Stuart.Carroll@greencap.com.au & robin.birua@greencap.com.au

№				Matrix Solid (S) Water (W)	Suite B1	BTEX	Containers: 500mL Plastic - Unpreserved	500mL Plastic - Sodium Thiosulfate	60mL Plastic - Metals	200mL Amber Glass	40mL VOA Glass Vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	TP01	0.00	2/06/20	Soil									1		
2		0.10	2/06/20	Soil									1		
3		0.70	2/06/20	Soil									1		
4		1.20	2/06/20	Soil									1		
5	TP02	0.00	2/06/20	Soil									1		
6		0.10	2/06/20	Soil									1		
7		0.60	2/06/20	Soil									1		
8		1.10	2/06/20	Soil									1		
9	TP03	0.00	2/06/20	Soil									1		
6		0.09	2/06/20	Soil									1		
6		0.20	2/06/20	Soil									1		
6		0.75	2/06/20	Soil									1		
6		1.50	2/06/20	Soil									1		
6		2.00	2/06/20	Soil									1		
6	TP04	0.00	3/06/20	Soil									1		
6		0.10	3/06/20	Soil									1		
6		0.40	3/06/20	Soil									1		
6		0.60	3/06/20	Soil									1		
6		1.10	3/06/20	Soil									1		
6		1.80	3/06/20	Soil									1		
6		2.05	3/06/20	Soil									1		
6	TP05	0.00	3/06/20	Soil									1		
6		0.65	3/06/20	Soil									1		
6		1.00	3/06/20	Soil	1								1		
6	TP06	0.00	3/06/20	Soil									1		
6		0.75	3/06/20	Soil									1		
6	TP07	0.00	3/06/20	Soil									1		
6		0.10	3/06/20	Soil									1		
6		0.70	3/06/20	Soil									1		
6		1.20	3/06/20	Soil	1								1		
6		1.50	3/06/20	Soil									1		
		1.60	3/06/20	Soil									1		
		1.90	3/06/20	Soil									1		

Containers: Change container type & size if necessary

Required Turnaround Time (TAT): Default will be 5 days if not ticked.

♦Surcharge will apply

- ☐ Overnight (reporting by 9am)♦
- ☐ Same day♦
- ☑ 1 day♦
- ☐ 2 days♦
- ☐ 3 days♦
- ☐ 5 days (Standard)
- ☐ Other( )

Catheus
tr
10/6 10.12 a.m

724946

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| | | |

eurofins | Environment Testing

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Sample Receipt Advice

Company name:	**Greencap NT P/L**
Contact name:	Stuart Carroll
Project name:	One Rail - Diesel Spill Investigation
Project ID:	J168829
COC number:	Not provided
Turn around time:	1 Day
Date/Time received:	Jun 10, 2020 10:12 AM
Eurofins reference:	**724546**

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

BH16-1.20 RECEIVED BROKEN. TP07-1.5 & BH11-0.0 NOT RECEIVED. BH01-0.08, BH01-0.15, BH01-0.5 (DATED 03/06), BH17-3.0, BH04-0.0A, TP06-1.5 RECEIVED EXTRA AND PLACED ON HOLD

Contact notes

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

Michael Morrison on Phone : 03 8564 5933 or by e.mail: MichaelMorrison@eurofins.com

Results will be delivered electronically via e.mail to Stuart Carroll - stuart.carroll@greencap.com.au.

Note: A copy of these results will also be delivered to the general Greencap NT P/L email address.

DRAFT

Greencap NT P/L
11/14 Winnellie Road
Winnellie
NT 0800

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Stuart Carroll**

Report **724546-S**
Project name One Rail - Diesel Spill Investigation
Project ID J168829
Received Date Jun 10, 2020

Client Sample ID			**TP05-1.00**	**TP07-1.20**	**TP08-1.70**	**TP09-0.00**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M20-Jn14047**	**M20-Jn14048**	**M20-Jn14049**	**M20-Jn14050**
Date Sampled			**Jun 03, 2020**	**Jun 03, 2020**	**Jun 03, 2020**	**Jun 03, 2020**
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-C36 (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	%	114	101	124	119
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
% Moisture	1	%	30	46	19	9.0

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Client Sample ID			TP10-0.25	BH03-0.00	BH03-0.60	BH03-2.00
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn14051	M20-Jn14052	M20-Jn14053	M20-Jn14054
Date Sampled			Jun 05, 2020	Jun 04, 2020	Jun 04, 2020	Jun 04, 2020
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	90	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	70	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	160	< 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	%	131	124	116	119
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	110	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	110	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	220	< 100	< 100
% Moisture	1	%	2.7	5.4	11	6.8

Client Sample ID			BH04-0.00	BH06-0.70	BH07-0.50	BH07-1.35
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn14055	M20-Jn14056	M20-Jn14057	M20-Jn14058
Date Sampled			Jun 04, 2020	Jun 04, 2020	Jun 04, 2020	Jun 04, 2020
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	120	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	120	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	240	< 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	%	133	124	122	123

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Client Sample ID			BH04-0.00	BH06-0.70	BH07-0.50	BH07-1.35
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn14055	M20-Jn14056	M20-Jn14057	M20-Jn14058
Date Sampled			Jun 04, 2020	Jun 04, 2020	Jun 04, 2020	Jun 04, 2020
Test/Reference	LOR	Unit				
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	160	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	180	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	340	< 100	< 100	< 100
% Moisture	1	%	5.0	8.6	10	8.3

Client Sample ID			BH08A-2.50	BH08A-3.50	BH12-0.03	BH13-0.25
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn14059	M20-Jn14060	M20-Jn14062	M20-Jn14063
Date Sampled			Jun 04, 2020	Jun 04, 2020	Jun 04, 2020	Jun 05, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 200
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	15000
TRH C15-C28	50	mg/kg	< 50	< 50	96	32000
TRH C29-C36	50	mg/kg	< 50	< 50	170	< 5000
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	266	47000
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	1.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	2.7
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	8.9
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	6.4
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	15
4-Bromofluorobenzene (surr.)	1	%	120	118	132	104
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	290
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	270
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	24000
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	24000
TRH >C16-C34	100	mg/kg	< 100	< 100	180	20000
TRH >C34-C40	100	mg/kg	< 100	< 100	230	< 10000
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	410	44000
% Moisture	1	%	7.1	18	4.7	9.0

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Client Sample ID			BH13-0.55	BH14-0.25	BH14-0.60	BH14-0.90
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn14064	M20-Jn14065	M20-Jn14066	M20-Jn14067
Date Sampled			Jun 05, 2020	Jun 05, 2020	Jun 05, 2020	Jun 05, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 200	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	13000	< 20	79
TRH C15-C28	50	mg/kg	< 50	26000	82	220
TRH C29-C36	50	mg/kg	< 50	< 5000	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	39000	82	299
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	4.0	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	6.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	20	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	12	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	32	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	100	88	100	86
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	470	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	430	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	20000	< 50	140
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	20000	< 50	140
TRH >C16-C34	100	mg/kg	< 100	16000	< 100	150
TRH >C34-C40	100	mg/kg	< 100	< 10000	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	36000	< 100	290
% Moisture	1	%	15	3.8	11	7.9

Client Sample ID			BH14-3.10	BH15-0.25	BH15-0.30	BH15-0.80
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn14068	M20-Jn14069	M20-Jn14070	M20-Jn14071
Date Sampled			Jun 05, 2020	Jun 05, 2020	Jun 05, 2020	Jun 05, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 200	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	18000	270	< 20
TRH C15-C28	50	mg/kg	< 50	36000	1000	< 50
TRH C29-C36	50	mg/kg	< 50	< 5000	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	54000	1270	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	2.6	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	5.2	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	17	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	11	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	28	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	89	141	101	94

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Client Sample ID			BH14-3.10	BH15-0.25	BH15-0.30	BH15-0.80
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn14068	M20-Jn14069	M20-Jn14070	M20-Jn14071
Date Sampled			Jun 05, 2020	Jun 05, 2020	Jun 05, 2020	Jun 05, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	480	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	440	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	27000	550	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	27000	550	< 50
TRH >C16-C34	100	mg/kg	< 100	23000	730	< 100
TRH >C34-C40	100	mg/kg	< 100	< 10000	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	50000	1280	< 100
% Moisture	1	%	17	8.1	7.8	6.9

Client Sample ID			BH15-3.05	BH16-0.00	BH16-0.30	BH17-0.00
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn14072	M20-Jn14073	M20-Jn14074	M20-Jn14075
Date Sampled			Jun 05, 2020	Jun 05, 2020	Jun 05, 2020	Jun 05, 2020
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-C36 (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	%	102	103	96	108
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
% Moisture	1	%	15	7.0	9.3	6.5

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Client Sample ID			BH17-0.45	QA05	QA07
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			M20-Jn14076	M20-Jn14077	M20-Jn14078
Date Sampled			Jun 05, 2020	Jun 04, 2020	Jun 05, 2020
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	740	< 20	< 20
TRH C15-C28	50	mg/kg	1500	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	2240	< 50	< 50
BTEX					
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	0.3	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	1.1	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	0.7	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	1.8	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	104	130	113
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	45	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	43	< 20	< 20
TRH >C10-C16	50	mg/kg	1200	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	1200	< 50	< 50
TRH >C16-C34	100	mg/kg	990	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	2190	< 100	< 100
% Moisture	1	%	9.1	7.4	19

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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
Eurofins | mgt Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jun 10, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Jun 10, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 10, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 10, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
% Moisture	Melbourne	Jun 10, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

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Company Name: Greencap NT P/L
Address: 11/14 Winnellie Road
Winnellie
NT 0800

Project Name: One Rail - Diesel Spill Investigation
Project ID: J168829

Order No.:
Report #: 724546
Phone: 61 8 8984 4244
Fax: 61 8 8984 3105

Received: Jun 10, 2020 10:12 AM
Due: Jun 11, 2020
Priority: 1 Day
Contact Name: Stuart Carroll

Eurofins Analytical Services Manager : Michael Morrison

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Sample Detail						HOLD	BTEX	Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	TP05-1.00	Jun 03, 2020		Soil	M20-Jn14047			X	X
2	TP07-1.20	Jun 03, 2020		Soil	M20-Jn14048			X	X
3	TP08-1.70	Jun 03, 2020		Soil	M20-Jn14049			X	X
4	TP09-0.00	Jun 03, 2020		Soil	M20-Jn14050			X	X
5	TP10-0.25	Jun 05, 2020		Soil	M20-Jn14051			X	X
6	BH03-0.00	Jun 04, 2020		Soil	M20-Jn14052			X	X
7	BH03-0.60	Jun 04, 2020		Soil	M20-Jn14053			X	X
8	BH03-2.00	Jun 04, 2020		Soil	M20-Jn14054			X	X
9	BH04-0.00	Jun 04, 2020		Soil	M20-Jn14055			X	X
10	BH06-0.70	Jun 04, 2020		Soil	M20-Jn14056			X	X

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Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
11	BH07-0.50	Jun 04, 2020		Soil	M20-Jn14057			X	X
12	BH07-1.35	Jun 04, 2020		Soil	M20-Jn14058			X	X
13	BH08A-2.50	Jun 04, 2020		Soil	M20-Jn14059			X	X
14	BH08A-3.50	Jun 04, 2020		Soil	M20-Jn14060			X	X
15	BH12-0.03	Jun 04, 2020		Soil	M20-Jn14062			X	X
16	BH13-0.25	Jun 05, 2020		Soil	M20-Jn14063			X	X
17	BH13-0.55	Jun 05, 2020		Soil	M20-Jn14064			X	X
18	BH14-0.25	Jun 05, 2020		Soil	M20-Jn14065			X	X
19	BH14-0.60	Jun 05, 2020		Soil	M20-Jn14066			X	X
20	BH14-0.90	Jun 05, 2020		Soil	M20-Jn14067			X	X
21	BH14-3.10	Jun 05, 2020		Soil	M20-Jn14068			X	X
22	BH15-0.25	Jun 05, 2020		Soil	M20-Jn14069			X	X
23	BH15-0.30	Jun 05, 2020		Soil	M20-Jn14070			X	X

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Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
24	BH15-0.80	Jun 05, 2020		Soil	M20-Jn14071			X	X
25	BH15-3.05	Jun 05, 2020		Soil	M20-Jn14072			X	X
26	BH16-0.00	Jun 05, 2020		Soil	M20-Jn14073			X	X
27	BH16-0.30	Jun 05, 2020		Soil	M20-Jn14074			X	X
28	BH17-0.00	Jun 05, 2020		Soil	M20-Jn14075			X	X
29	BH17-0.45	Jun 05, 2020		Soil	M20-Jn14076			X	X
30	QA05	Jun 04, 2020		Soil	M20-Jn14077			X	X
31	QA07	Jun 05, 2020		Soil	M20-Jn14078			X	X
32	TP01-0.00	Jun 02, 2020		Soil	M20-Jn14079	X			
33	TP01-0.10	Jun 02, 2020		Soil	M20-Jn14080	X			
34	TP01-0.70	Jun 02, 2020		Soil	M20-Jn14081	X			
35	TP01-1.20	Jun 02, 2020		Soil	M20-Jn14082	X			
36	TP02-0.00	Jun 02, 2020		Soil	M20-Jn14083	X			

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Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
37	TP02-0.10	Jun 02, 2020		Soil	M20-Jn14084	X			
38	TP02-0.60	Jun 02, 2020		Soil	M20-Jn14085	X			
39	TP02-1.10	Jun 02, 2020		Soil	M20-Jn14086	X			
40	TP03-0.00	Jun 02, 2020		Soil	M20-Jn14087	X			
41	TP03-0.09	Jun 02, 2020		Soil	M20-Jn14088	X			
42	TP03-0.20	Jun 02, 2020		Soil	M20-Jn14089	X			
43	TP03-0.75	Jun 02, 2020		Soil	M20-Jn14090	X			
44	TP03-1.50	Jun 02, 2020		Soil	M20-Jn14091	X			
45	TP03-2.00	Jun 02, 2020		Soil	M20-Jn14092	X			
46	TP04-0.00	Jun 03, 2020		Soil	M20-Jn14093	X			
47	TP04-0.10	Jun 03, 2020		Soil	M20-Jn14094	X			
48	TP04-0.40	Jun 03, 2020		Soil	M20-Jn14095	X			
49	TP04-0.60	Jun 03, 2020		Soil	M20-Jn14096	X			

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Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
50	TP04-1.10	Jun 03, 2020		Soil	M20-Jn14097	X			
51	TP04-1.80	Jun 03, 2020		Soil	M20-Jn14098	X			
52	TP04-2.05	Jun 03, 2020		Soil	M20-Jn14099	X			
53	TP05-0.00	Jun 03, 2020		Soil	M20-Jn14100	X			
54	TP05-0.65	Jun 03, 2020		Soil	M20-Jn14101	X			
55	TP06-0.00	Jun 03, 2020		Soil	M20-Jn14102	X			
56	TP06-0.75	Jun 03, 2020		Soil	M20-Jn14103	X			
57	TP07-0.00	Jun 03, 2020		Soil	M20-Jn14104	X			
58	TP07-0.10	Jun 03, 2020		Soil	M20-Jn14105	X			
59	TP07-0.70	Jun 03, 2020		Soil	M20-Jn14106	X			
60	TP07-1.60	Jun 03, 2020		Soil	M20-Jn14108	X			
61	TP07-1.90	Jun 03, 2020		Soil	M20-Jn14109	X			
62	TP08-0.00	Jun 03, 2020		Soil	M20-Jn14110	X			

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Perth Laboratory - NATA Site # 23736									
63	TP08-0.05	Jun 03, 2020		Soil	M20-Jn14111	X			
64	TP08-0.45	Jun 03, 2020		Soil	M20-Jn14112	X			
65	TP08-0.65	Jun 03, 2020		Soil	M20-Jn14113	X			
66	TP08-1.30	Jun 03, 2020		Soil	M20-Jn14114	X			
67	TP09-0.15	Jun 03, 2020		Soil	M20-Jn14115	X			
68	TP09-0.50	Jun 03, 2020		Soil	M20-Jn14116	X			
69	TP09-1.00	Jun 03, 2020		Soil	M20-Jn14117	X			
70	TP09-1.50	Jun 03, 2020		Soil	M20-Jn14118	X			
71	TP09-2.00	Jun 03, 2020		Soil	M20-Jn14119	X			
72	TP09-2.15	Jun 03, 2020		Soil	M20-Jn14120	X			
73	TP10-0.35	Jun 05, 2020		Soil	M20-Jn14121	X			
74	BH01-0.0	Jun 04, 2020		Soil	M20-Jn14122	X			
75	BH01-0.30	Jun 04, 2020		Soil	M20-Jn14123	X			

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76	BH01-0.50	Jun 04, 2020		Soil	M20-Jn14124	X			
77	BH01-0.80	Jun 04, 2020		Soil	M20-Jn14125	X			
78	BH01-1.20	Jun 04, 2020		Soil	M20-Jn14126	X			
79	BH01-1.50	Jun 04, 2020		Soil	M20-Jn14127	X			
80	BH02-0.00	Jun 04, 2020		Soil	M20-Jn14128	X			
81	BH02-0.40	Jun 04, 2020		Soil	M20-Jn14129	X			
82	BH02-0.80	Jun 04, 2020		Soil	M20-Jn14130	X			
83	BH02-1.30	Jun 04, 2020		Soil	M20-Jn14131	X			
84	BH02-1.50	Jun 04, 2020		Soil	M20-Jn14132	X			
85	BH03-0.35	Jun 04, 2020		Soil	M20-Jn14133	X			
86	BH03-1.40	Jun 04, 2020		Soil	M20-Jn14134	X			
87	BH03-1.60	Jun 04, 2020		Soil	M20-Jn14135	X			
88	BH03-3.10	Jun 04, 2020		Soil	M20-Jn14136	X			

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89	BH03-3.20	Jun 04, 2020		Soil	M20-Jn14137	X			
90	BH03-4.00	Jun 04, 2020		Soil	M20-Jn14138	X			
91	BH03-4.50	Jun 04, 2020		Soil	M20-Jn14139	X			
92	BH04-0.25	Jun 04, 2020		Soil	M20-Jn14140	X			
93	BH04-0.45	Jun 04, 2020		Soil	M20-Jn14141	X			
94	BH04-0.80	Jun 04, 2020		Soil	M20-Jn14142	X			
95	BH04-1.35	Jun 04, 2020		Soil	M20-Jn14143	X			
96	BH05-0.00	Jun 04, 2020		Soil	M20-Jn14144	X			
97	BH05-0.45	Jun 04, 2020		Soil	M20-Jn14145	X			
98	BH05-0.80	Jun 04, 2020		Soil	M20-Jn14146	X			
99	BH05-1.40	Jun 04, 2020		Soil	M20-Jn14147	X			
100	BH06-0.00	Jun 04, 2020		Soil	M20-Jn14148	X			
101	BH06-0.30	Jun 04, 2020		Soil	M20-Jn14149	X			

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
102	BH06-1.17	Jun 04, 2020		Soil	M20-Jn14150	X			
103	BH06-1.40	Jun 04, 2020		Soil	M20-Jn14151	X			
104	BH07-0.20	Jun 04, 2020		Soil	M20-Jn14152	X			
105	BH07-0.80	Jun 04, 2020		Soil	M20-Jn14153	X			
106	BH08-0.17	Jun 04, 2020		Soil	M20-Jn14154	X			
107	BH08-0.40	Jun 04, 2020		Soil	M20-Jn14155	X			
108	BH08-1.05	Jun 04, 2020		Soil	M20-Jn14156	X			
109	BH08-1.40	Jun 04, 2020		Soil	M20-Jn14157	X			
110	BH08A-2.00	Jun 04, 2020		Soil	M20-Jn14158	X			
111	BH08A-3.00	Jun 04, 2020		Soil	M20-Jn14159	X			
112	BH08A-3.90	Jun 04, 2020		Soil	M20-Jn14160	X			
113	BH09-0.25	Jun 04, 2020		Soil	M20-Jn14161	X			
114	BH09-0.60	Jun 04, 2020		Soil	M20-Jn14162	X			

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Company Name: Greencap NT P/L
Address: 11/14 Winnellie Road
Winnellie
NT 0800

Project Name: One Rail - Diesel Spill Investigation
Project ID: J168829

Order No.:
Report #: 724546
Phone: 61 8 8984 4244
Fax: 61 8 8984 3105

Received: Jun 10, 2020 10:12 AM
Due: Jun 11, 2020
Priority: 1 Day
Contact Name: Stuart Carroll

Eurofins Analytical Services Manager : Michael Morrison

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Perth Laboratory - NATA Site # 23736									
115	BH09-1.07	Jun 04, 2020		Soil	M20-Jn14163	X			
116	BH09-1.35	Jun 04, 2020		Soil	M20-Jn14164	X			
117	BH10-0.00	Jun 04, 2020		Soil	M20-Jn14165	X			
118	BH10-0.30	Jun 04, 2020		Soil	M20-Jn14166	X			
119	BH10-0.80	Jun 04, 2020		Soil	M20-Jn14167	X			
120	BH11-0.03	Jun 04, 2020		Soil	M20-Jn14168	X			
121	BH11-0.30	Jun 04, 2020		Soil	M20-Jn14169	X			
122	BH11-0.50	Jun 04, 2020		Soil	M20-Jn14170	X			
123	BH11-1.00	Jun 04, 2020		Soil	M20-Jn14171	X			
124	BH11-1.50	Jun 04, 2020		Soil	M20-Jn14172	X			
125	BH11-2.00	Jun 04, 2020		Soil	M20-Jn14173	X			
126	BH11-2.20	Jun 04, 2020		Soil	M20-Jn14174	X			
127	BH11-2.60	Jun 04, 2020		Soil	M20-Jn14175	X			

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Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
128	BH12-0.20	Jun 04, 2020		Soil	M20-Jn14176	X			
129	BH12-0.50	Jun 04, 2020		Soil	M20-Jn14177	X			
130	BH12-1.40	Jun 04, 2020		Soil	M20-Jn14178	X			
131	BH12-1.50	Jun 04, 2020		Soil	M20-Jn14179	X			
132	BH13-0.90	Jun 05, 2020		Soil	M20-Jn14180	X			
133	BH13-1.20	Jun 05, 2020		Soil	M20-Jn14181	X			
134	BH14-0.40	Jun 05, 2020		Soil	M20-Jn14182	X			
135	BH14-0.70	Jun 05, 2020		Soil	M20-Jn14183	X			
136	BH14-0.80	Jun 05, 2020		Soil	M20-Jn14184	X			
137	BH14-1.50	Jun 05, 2020		Soil	M20-Jn14185	X			
138	BH14-2.00	Jun 05, 2020		Soil	M20-Jn14186	X			
139	BH14-3.00	Jun 05, 2020		Soil	M20-Jn14187	X			
140	BH14-3.50	Jun 05, 2020		Soil	M20-Jn14188	X			

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Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
141	BH15-0.60	Jun 05, 2020		Soil	M20-Jn14189	X			
142	BH15-1.20	Jun 05, 2020		Soil	M20-Jn14190	X			
143	BH15-1.25	Jun 05, 2020		Soil	M20-Jn14191	X			
144	BH15-2.00	Jun 05, 2020		Soil	M20-Jn14192	X			
145	BH15-3.50	Jun 05, 2020		Soil	M20-Jn14193	X			
146	BH16-0.50	Jun 05, 2020		Soil	M20-Jn14196	X			
147	BH16-0.85	Jun 05, 2020		Soil	M20-Jn14197	X			
148	BH16-1.40	Jun 05, 2020		Soil	M20-Jn14199	X			
149	BH16-2.40	Jun 05, 2020		Soil	M20-Jn14200	X			
150	BH16-2.60	Jun 05, 2020		Soil	M20-Jn14201	X			
151	BH16-3.00	Jun 05, 2020		Soil	M20-Jn14202	X			
152	BH17-0.65	Jun 05, 2020		Soil	M20-Jn14203	X			
153	BH17-1.15	Jun 05, 2020		Soil	M20-Jn14204	X			

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Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
154	BH17-1.65	Jun 05, 2020		Soil	M20-Jn14205	X			
155	BH17-2.40	Jun 05, 2020		Soil	M20-Jn14206	X			
156	BH17-3.40	Jun 05, 2020		Soil	M20-Jn14207	X			
157	QA01	Jun 02, 2020		Soil	M20-Jn14208	X			
158	QA03	Jun 04, 2020		Soil	M20-Jn14209	X			
159	QA09	Jun 05, 2020		Soil	M20-Jn14210	X			
160	TB01	Jun 02, 2020		Water	M20-Jn14211		X		
161	TB02	Jun 03, 2020		Water	M20-Jn14212		X		
162	TB03	Jun 04, 2020		Water	M20-Jn14213		X		
163	TB04	Jun 05, 2020		Water	M20-Jn14214		X		
164	BH01-0.08	Jun 04, 2020		Soil	M20-Jn14215	X			
165	BH17-3.00	Jun 05, 2020		Soil	M20-Jn14216	X			
166	BH04-0.0A	Jun 04, 2020		Soil	M20-Jn14217	X			

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Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
167	TP06-1.5	Jun 04, 2020		Soil	M20-Jn14218	X			
168	BH01-0.15	Jun 03, 2020		Soil	M20-Jn14219	X			
169	BH01-0.5 (03/06)	Jun 03, 2020		Soil	M20-Jn14222	X			
Test Counts						134	4	31	31

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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.

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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	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	119			70-130	Pass	
TRH C10-C14	%	92			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	120			70-130	Pass	
Toluene	%	105			70-130	Pass	
Ethylbenzene	%	106			70-130	Pass	
m&p-Xylenes	%	105			70-130	Pass	
Xylenes - Total*	%	105			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	102			70-130	Pass	
TRH C6-C10	%	120			70-130	Pass	
TRH >C10-C16	%	87			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	M20-Jn14054	CP	%	106			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M20-Jn14054	CP	%	101			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M20-Jn14066	CP	%	112			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M20-Jn14066	CP	%	105			70-130	Pass	
Toluene	M20-Jn14066	CP	%	103			70-130	Pass	

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Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Ethylbenzene	M20-Jn14066	CP	%	106			70-130	Pass	
m&p-Xylenes	M20-Jn14066	CP	%	104			70-130	Pass	
o-Xylene	M20-Jn14066	CP	%	108			70-130	Pass	
Xylenes - Total*	M20-Jn14066	CP	%	105			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M20-Jn14066	CP	%	119			70-130	Pass	
TRH C6-C10	M20-Jn14066	CP	%	111			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M20-Jn14075	CP	%	119			70-130	Pass	
TRH C10-C14	M20-Jn14075	CP	%	109			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M20-Jn14075	CP	%	114			70-130	Pass	
Toluene	M20-Jn14075	CP	%	113			70-130	Pass	
Ethylbenzene	M20-Jn14075	CP	%	117			70-130	Pass	
m&p-Xylenes	M20-Jn14075	CP	%	114			70-130	Pass	
o-Xylene	M20-Jn14075	CP	%	118			70-130	Pass	
Xylenes - Total*	M20-Jn14075	CP	%	115			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M20-Jn14075	CP	%	123			70-130	Pass	
TRH C6-C10	M20-Jn14075	CP	%	114			70-130	Pass	
TRH >C10-C16	M20-Jn14075	CP	%	100			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M20-Jn14053	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M20-Jn14053	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M20-Jn14053	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M20-Jn14053	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M20-Jn14053	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M20-Jn14053	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M20-Jn14053	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M20-Jn14053	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M20-Jn14053	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	M20-Jn14053	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M20-Jn14053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M20-Jn14053	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M20-Jn14053	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M20-Jn14053	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M20-Jn14053	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M20-Jn14053	CP	%	11	10	6.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M20-Jn14064	CP	%	15	13	15	30%	Pass	

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Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M20-Jn14074	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M20-Jn14074	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M20-Jn14074	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M20-Jn14074	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M20-Jn14074	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M20-Jn14074	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M20-Jn14074	CP	%	9.3	9.1	2.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M20-Jn14078	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M20-Jn14078	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M20-Jn14078	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M20-Jn14078	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M20-Jn14078	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M20-Jn14078	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	M20-Jn14078	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M20-Jn14078	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M20-Jn14078	CP	mg/kg	< 20	< 20	<1	30%	Pass	

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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
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.

Authorised By

Michael Morrison	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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Greencap NT P/L
11/14 Winnellie Road
Winnellie
NT 0800

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Stuart Carroll**

Report **724546-W**
Project name One Rail - Diesel Spill Investigation
Project ID J168829
Received Date Jun 10, 2020

Client Sample ID			**TB01**	**TB02**	**TB03**	**TB04**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**M20-Jn14211**	**M20-Jn14212**	**M20-Jn14213**	**M20-Jn14214**
Date Sampled			**Jun 02, 2020**	**Jun 03, 2020**	**Jun 04, 2020**	**Jun 05, 2020**
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	93	87	92	89

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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
Eurofins | mgt Suite B1			
BTEX	Melbourne	Jun 10, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			

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Company Name: Greencap NT P/L
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NT 0800

Project Name: One Rail - Diesel Spill Investigation
Project ID: J168829

Order No.:
Report #: 724546
Phone: 61 8 8984 4244
Fax: 61 8 8984 3105

Received: Jun 10, 2020 10:12 AM
Due: Jun 11, 2020
Priority: 1 Day
Contact Name: Stuart Carroll

Eurofins Analytical Services Manager : Michael Morrison

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Sample Detail						HOLD	BTEX	Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	TP05-1.00	Jun 03, 2020		Soil	M20-Jn14047			X	X
2	TP07-1.20	Jun 03, 2020		Soil	M20-Jn14048			X	X
3	TP08-1.70	Jun 03, 2020		Soil	M20-Jn14049			X	X
4	TP09-0.00	Jun 03, 2020		Soil	M20-Jn14050			X	X
5	TP10-0.25	Jun 05, 2020		Soil	M20-Jn14051			X	X
6	BH03-0.00	Jun 04, 2020		Soil	M20-Jn14052			X	X
7	BH03-0.60	Jun 04, 2020		Soil	M20-Jn14053			X	X
8	BH03-2.00	Jun 04, 2020		Soil	M20-Jn14054			X	X
9	BH04-0.00	Jun 04, 2020		Soil	M20-Jn14055			X	X
10	BH06-0.70	Jun 04, 2020		Soil	M20-Jn14056			X	X

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Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
11	BH07-0.50	Jun 04, 2020		Soil	M20-Jn14057			X	X
12	BH07-1.35	Jun 04, 2020		Soil	M20-Jn14058			X	X
13	BH08A-2.50	Jun 04, 2020		Soil	M20-Jn14059			X	X
14	BH08A-3.50	Jun 04, 2020		Soil	M20-Jn14060			X	X
15	BH12-0.03	Jun 04, 2020		Soil	M20-Jn14062			X	X
16	BH13-0.25	Jun 05, 2020		Soil	M20-Jn14063			X	X
17	BH13-0.55	Jun 05, 2020		Soil	M20-Jn14064			X	X
18	BH14-0.25	Jun 05, 2020		Soil	M20-Jn14065			X	X
19	BH14-0.60	Jun 05, 2020		Soil	M20-Jn14066			X	X
20	BH14-0.90	Jun 05, 2020		Soil	M20-Jn14067			X	X
21	BH14-3.10	Jun 05, 2020		Soil	M20-Jn14068			X	X
22	BH15-0.25	Jun 05, 2020		Soil	M20-Jn14069			X	X
23	BH15-0.30	Jun 05, 2020		Soil	M20-Jn14070			X	X

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Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
24	BH15-0.80	Jun 05, 2020		Soil	M20-Jn14071			X	X
25	BH15-3.05	Jun 05, 2020		Soil	M20-Jn14072			X	X
26	BH16-0.00	Jun 05, 2020		Soil	M20-Jn14073			X	X
27	BH16-0.30	Jun 05, 2020		Soil	M20-Jn14074			X	X
28	BH17-0.00	Jun 05, 2020		Soil	M20-Jn14075			X	X
29	BH17-0.45	Jun 05, 2020		Soil	M20-Jn14076			X	X
30	QA05	Jun 04, 2020		Soil	M20-Jn14077			X	X
31	QA07	Jun 05, 2020		Soil	M20-Jn14078			X	X
32	TP01-0.00	Jun 02, 2020		Soil	M20-Jn14079	X			
33	TP01-0.10	Jun 02, 2020		Soil	M20-Jn14080	X			
34	TP01-0.70	Jun 02, 2020		Soil	M20-Jn14081	X			
35	TP01-1.20	Jun 02, 2020		Soil	M20-Jn14082	X			
36	TP02-0.00	Jun 02, 2020		Soil	M20-Jn14083	X			

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Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
37	TP02-0.10	Jun 02, 2020		Soil	M20-Jn14084	X			
38	TP02-0.60	Jun 02, 2020		Soil	M20-Jn14085	X			
39	TP02-1.10	Jun 02, 2020		Soil	M20-Jn14086	X			
40	TP03-0.00	Jun 02, 2020		Soil	M20-Jn14087	X			
41	TP03-0.09	Jun 02, 2020		Soil	M20-Jn14088	X			
42	TP03-0.20	Jun 02, 2020		Soil	M20-Jn14089	X			
43	TP03-0.75	Jun 02, 2020		Soil	M20-Jn14090	X			
44	TP03-1.50	Jun 02, 2020		Soil	M20-Jn14091	X			
45	TP03-2.00	Jun 02, 2020		Soil	M20-Jn14092	X			
46	TP04-0.00	Jun 03, 2020		Soil	M20-Jn14093	X			
47	TP04-0.10	Jun 03, 2020		Soil	M20-Jn14094	X			
48	TP04-0.40	Jun 03, 2020		Soil	M20-Jn14095	X			
49	TP04-0.60	Jun 03, 2020		Soil	M20-Jn14096	X			

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Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
50	TP04-1.10	Jun 03, 2020		Soil	M20-Jn14097	X			
51	TP04-1.80	Jun 03, 2020		Soil	M20-Jn14098	X			
52	TP04-2.05	Jun 03, 2020		Soil	M20-Jn14099	X			
53	TP05-0.00	Jun 03, 2020		Soil	M20-Jn14100	X			
54	TP05-0.65	Jun 03, 2020		Soil	M20-Jn14101	X			
55	TP06-0.00	Jun 03, 2020		Soil	M20-Jn14102	X			
56	TP06-0.75	Jun 03, 2020		Soil	M20-Jn14103	X			
57	TP07-0.00	Jun 03, 2020		Soil	M20-Jn14104	X			
58	TP07-0.10	Jun 03, 2020		Soil	M20-Jn14105	X			
59	TP07-0.70	Jun 03, 2020		Soil	M20-Jn14106	X			
60	TP07-1.60	Jun 03, 2020		Soil	M20-Jn14108	X			
61	TP07-1.90	Jun 03, 2020		Soil	M20-Jn14109	X			
62	TP08-0.00	Jun 03, 2020		Soil	M20-Jn14110	X			

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Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
63	TP08-0.05	Jun 03, 2020		Soil	M20-Jn14111	X			
64	TP08-0.45	Jun 03, 2020		Soil	M20-Jn14112	X			
65	TP08-0.65	Jun 03, 2020		Soil	M20-Jn14113	X			
66	TP08-1.30	Jun 03, 2020		Soil	M20-Jn14114	X			
67	TP09-0.15	Jun 03, 2020		Soil	M20-Jn14115	X			
68	TP09-0.50	Jun 03, 2020		Soil	M20-Jn14116	X			
69	TP09-1.00	Jun 03, 2020		Soil	M20-Jn14117	X			
70	TP09-1.50	Jun 03, 2020		Soil	M20-Jn14118	X			
71	TP09-2.00	Jun 03, 2020		Soil	M20-Jn14119	X			
72	TP09-2.15	Jun 03, 2020		Soil	M20-Jn14120	X			
73	TP10-0.35	Jun 05, 2020		Soil	M20-Jn14121	X			
74	BH01-0.0	Jun 04, 2020		Soil	M20-Jn14122	X			
75	BH01-0.30	Jun 04, 2020		Soil	M20-Jn14123	X			

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Fax: 61 8 8984 3105

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
76	BH01-0.50	Jun 04, 2020		Soil	M20-Jn14124	X			
77	BH01-0.80	Jun 04, 2020		Soil	M20-Jn14125	X			
78	BH01-1.20	Jun 04, 2020		Soil	M20-Jn14126	X			
79	BH01-1.50	Jun 04, 2020		Soil	M20-Jn14127	X			
80	BH02-0.00	Jun 04, 2020		Soil	M20-Jn14128	X			
81	BH02-0.40	Jun 04, 2020		Soil	M20-Jn14129	X			
82	BH02-0.80	Jun 04, 2020		Soil	M20-Jn14130	X			
83	BH02-1.30	Jun 04, 2020		Soil	M20-Jn14131	X			
84	BH02-1.50	Jun 04, 2020		Soil	M20-Jn14132	X			
85	BH03-0.35	Jun 04, 2020		Soil	M20-Jn14133	X			
86	BH03-1.40	Jun 04, 2020		Soil	M20-Jn14134	X			
87	BH03-1.60	Jun 04, 2020		Soil	M20-Jn14135	X			
88	BH03-3.10	Jun 04, 2020		Soil	M20-Jn14136	X			

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Perth Laboratory - NATA Site # 23736									
89	BH03-3.20	Jun 04, 2020		Soil	M20-Jn14137	X			
90	BH03-4.00	Jun 04, 2020		Soil	M20-Jn14138	X			
91	BH03-4.50	Jun 04, 2020		Soil	M20-Jn14139	X			
92	BH04-0.25	Jun 04, 2020		Soil	M20-Jn14140	X			
93	BH04-0.45	Jun 04, 2020		Soil	M20-Jn14141	X			
94	BH04-0.80	Jun 04, 2020		Soil	M20-Jn14142	X			
95	BH04-1.35	Jun 04, 2020		Soil	M20-Jn14143	X			
96	BH05-0.00	Jun 04, 2020		Soil	M20-Jn14144	X			
97	BH05-0.45	Jun 04, 2020		Soil	M20-Jn14145	X			
98	BH05-0.80	Jun 04, 2020		Soil	M20-Jn14146	X			
99	BH05-1.40	Jun 04, 2020		Soil	M20-Jn14147	X			
100	BH06-0.00	Jun 04, 2020		Soil	M20-Jn14148	X			
101	BH06-0.30	Jun 04, 2020		Soil	M20-Jn14149	X			

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Perth Laboratory - NATA Site # 23736									
102	BH06-1.17	Jun 04, 2020		Soil	M20-Jn14150	X			
103	BH06-1.40	Jun 04, 2020		Soil	M20-Jn14151	X			
104	BH07-0.20	Jun 04, 2020		Soil	M20-Jn14152	X			
105	BH07-0.80	Jun 04, 2020		Soil	M20-Jn14153	X			
106	BH08-0.17	Jun 04, 2020		Soil	M20-Jn14154	X			
107	BH08-0.40	Jun 04, 2020		Soil	M20-Jn14155	X			
108	BH08-1.05	Jun 04, 2020		Soil	M20-Jn14156	X			
109	BH08-1.40	Jun 04, 2020		Soil	M20-Jn14157	X			
110	BH08A-2.00	Jun 04, 2020		Soil	M20-Jn14158	X			
111	BH08A-3.00	Jun 04, 2020		Soil	M20-Jn14159	X			
112	BH08A-3.90	Jun 04, 2020		Soil	M20-Jn14160	X			
113	BH09-0.25	Jun 04, 2020		Soil	M20-Jn14161	X			
114	BH09-0.60	Jun 04, 2020		Soil	M20-Jn14162	X			

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Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
115	BH09-1.07	Jun 04, 2020		Soil	M20-Jn14163	X			
116	BH09-1.35	Jun 04, 2020		Soil	M20-Jn14164	X			
117	BH10-0.00	Jun 04, 2020		Soil	M20-Jn14165	X			
118	BH10-0.30	Jun 04, 2020		Soil	M20-Jn14166	X			
119	BH10-0.80	Jun 04, 2020		Soil	M20-Jn14167	X			
120	BH11-0.03	Jun 04, 2020		Soil	M20-Jn14168	X			
121	BH11-0.30	Jun 04, 2020		Soil	M20-Jn14169	X			
122	BH11-0.50	Jun 04, 2020		Soil	M20-Jn14170	X			
123	BH11-1.00	Jun 04, 2020		Soil	M20-Jn14171	X			
124	BH11-1.50	Jun 04, 2020		Soil	M20-Jn14172	X			
125	BH11-2.00	Jun 04, 2020		Soil	M20-Jn14173	X			
126	BH11-2.20	Jun 04, 2020		Soil	M20-Jn14174	X			
127	BH11-2.60	Jun 04, 2020		Soil	M20-Jn14175	X			

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Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
128	BH12-0.20	Jun 04, 2020		Soil	M20-Jn14176	X			
129	BH12-0.50	Jun 04, 2020		Soil	M20-Jn14177	X			
130	BH12-1.40	Jun 04, 2020		Soil	M20-Jn14178	X			
131	BH12-1.50	Jun 04, 2020		Soil	M20-Jn14179	X			
132	BH13-0.90	Jun 05, 2020		Soil	M20-Jn14180	X			
133	BH13-1.20	Jun 05, 2020		Soil	M20-Jn14181	X			
134	BH14-0.40	Jun 05, 2020		Soil	M20-Jn14182	X			
135	BH14-0.70	Jun 05, 2020		Soil	M20-Jn14183	X			
136	BH14-0.80	Jun 05, 2020		Soil	M20-Jn14184	X			
137	BH14-1.50	Jun 05, 2020		Soil	M20-Jn14185	X			
138	BH14-2.00	Jun 05, 2020		Soil	M20-Jn14186	X			
139	BH14-3.00	Jun 05, 2020		Soil	M20-Jn14187	X			
140	BH14-3.50	Jun 05, 2020		Soil	M20-Jn14188	X			

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Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
141	BH15-0.60	Jun 05, 2020		Soil	M20-Jn14189	X			
142	BH15-1.20	Jun 05, 2020		Soil	M20-Jn14190	X			
143	BH15-1.25	Jun 05, 2020		Soil	M20-Jn14191	X			
144	BH15-2.00	Jun 05, 2020		Soil	M20-Jn14192	X			
145	BH15-3.50	Jun 05, 2020		Soil	M20-Jn14193	X			
146	BH16-0.50	Jun 05, 2020		Soil	M20-Jn14196	X			
147	BH16-0.85	Jun 05, 2020		Soil	M20-Jn14197	X			
148	BH16-1.40	Jun 05, 2020		Soil	M20-Jn14199	X			
149	BH16-2.40	Jun 05, 2020		Soil	M20-Jn14200	X			
150	BH16-2.60	Jun 05, 2020		Soil	M20-Jn14201	X			
151	BH16-3.00	Jun 05, 2020		Soil	M20-Jn14202	X			
152	BH17-0.65	Jun 05, 2020		Soil	M20-Jn14203	X			
153	BH17-1.15	Jun 05, 2020		Soil	M20-Jn14204	X			

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Brisbane Laboratory - NATA Site # 20794									
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154	BH17-1.65	Jun 05, 2020		Soil	M20-Jn14205	X			
155	BH17-2.40	Jun 05, 2020		Soil	M20-Jn14206	X			
156	BH17-3.40	Jun 05, 2020		Soil	M20-Jn14207	X			
157	QA01	Jun 02, 2020		Soil	M20-Jn14208	X			
158	QA03	Jun 04, 2020		Soil	M20-Jn14209	X			
159	QA09	Jun 05, 2020		Soil	M20-Jn14210	X			
160	TB01	Jun 02, 2020		Water	M20-Jn14211		X		
161	TB02	Jun 03, 2020		Water	M20-Jn14212		X		
162	TB03	Jun 04, 2020		Water	M20-Jn14213		X		
163	TB04	Jun 05, 2020		Water	M20-Jn14214		X		
164	BH01-0.08	Jun 04, 2020		Soil	M20-Jn14215	X			
165	BH17-3.00	Jun 05, 2020		Soil	M20-Jn14216	X			
166	BH04-0.0A	Jun 04, 2020		Soil	M20-Jn14217	X			

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Sydney Laboratory - NATA Site # 18217									
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Perth Laboratory - NATA Site # 23736									
167	TP06-1.5	Jun 04, 2020		Soil	M20-Jn14218	X			
168	BH01-0.15	Jun 03, 2020		Soil	M20-Jn14219	X			
169	BH01-0.5 (03/06)	Jun 03, 2020		Soil	M20-Jn14222	X			
Test Counts						134	4	31	31

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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.

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Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	99			70-130	Pass	
Toluene	%	97			70-130	Pass	
Ethylbenzene	%	95			70-130	Pass	
m&p-Xylenes	%	95			70-130	Pass	
Xylenes - Total*	%	96			70-130	Pass	

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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

Authorised By

Michael Morrison	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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.

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CHAIN OF CUSTODY RECORD

Eurofins | mgt 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 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** 6 Monterey Road Dandenong South VIC 3175 03 8564 5000 EnviroSampleVic@eurofins.com

Company	Greencap NT P/L	Project №	J168829	Project Manager	Stuart Carroll
Address	11/14 Winnellie Road, Winnellie, NT, 0800	Project Name	One Rail - Diesel Spill Investigation	EDD Format (ESdat, EQuIS etc)	
Contact Name	Stuart Carroll				
Phone №	0466 776 038				
Special Directions					
Purchase Order	275593				
Quote ID №					

Sampler(s)	Staurt Carroll & Robin Birua
Handed over by	N/A
Email for Results	Stuart.Carroll@greencap.com.au & robin.birua@greencap.com.au

Containers (Change container type & size if necessary.)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked.)

♦Surcharge will apply

☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☑ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☐ 5 days (Standard)
☐ Other( )

№	Client Sample ID		Date	Matrix Solid (S) Water (W)	Suite B1	BTEX	500mL Plastic - Unpreserved	500mL Plastic - Sodium Thiosulfate	60mL Plastic - Metals	200mL Amber Glass	40mL VOA Glass Vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	NDTP01_0.0		10/06/20	Soil									1		
2	NDTP01_0.5		10/06/20	Soil	1								1		
3	NDTP02_0.5		10/06/20	Soil	1								1		
4	NDTP03_0.0		10/06/20	Soil									1		
5	NDTP03_0.5		10/06/20	Soil	1								1		
6	NDTP04_0.1		10/06/20	Soil									1		
7	NDTP04_0.6		10/06/20	Soil	1								1		
8	NDTP05_0.2		10/06/20	Soil	1								1		
9	NDTP06_0.0		10/06/20	Soil									1		
6	NDTP06_0.35		10/06/20	Soil	1								1		
6	TP11_0.35		10/06/20	Soil	1								1		
6	TP11_0.55		10/06/20	Soil									1		
6	TP11_0.80		10/06/20	Soil	1								1		
6	TP12_0.0		10/06/20	Soil	1								1		
6	TP12_0.2		10/06/20	Soil									1		
6	TP12_0.6		10/06/20	Soil	1								1		
6	TP13_0.0		10/06/20	Soil									1		
6	TP13_0.35		10/06/20	Soil									1		
6	TP13_0.6		10/06/20	Soil									1		
6	TP13_1.0		10/06/20	Soil									1		
6	TP14_0.0		10/06/20	Soil									1		
6	TP14_0.2		10/06/20	Soil									1		
6	TP_0.4		10/06/20	Soil									1		
6	TP15_0.3		10/06/20	Soil	1								1		
6	TP16_0.35		10/06/20	Soil									1		
6	TP16_0.45		10/06/20	Soil									1		
6	TP16_0.7		10/06/20	Soil									1		
6	TP16_1.0		10/06/20	Soil									1		
6	TP17_xx		10/06/20	Soil									1		

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24 Hr TAT Please

6	TP17_xx		10/06/20	Soil																				1	
6	TP18_00		10/06/20	Soil		1																		1	
	TP18_0.1		10/06/20	Soil		1																		1	
	TP19_0.0		10/06/20	Soil																				1	
	TP19_0.35		10/06/20	Soil		1																		1	
	TP19_1.2		10/06/20	Soil																				1	
	TP20_0.0		10/06/20	Soil																				1	
	TP20_0.4		10/06/20	Soil																				1	
	TP20_0.9		10/06/20	Soil		1																		1	
	TP20_1.3		10/06/20	Soil																				1	
	TP21_0.35		10/06/20	Soil		1																		1	
	TP21_0.4		10/06/20	Soil																				1	
	TP21_0.6		10/06/20	Soil																				1	
	TP22_0.35		10/06/20	Soil		1																		1	
	TP22_0.6		10/06/20	Soil																				1	
	TP23_0.30		10/06/20	Soil																				1	
	TP23_0.35		10/06/20	Soil																				1	
	TP23_0.6		10/06/20	Soil																				1	
	TP24_0.3		10/06/20	Soil		1																		1	
	TP24_0.35		10/06/20	Soil																				1	
	TP25_0.35		10/06/20	Soil																				1	
	TP25_0.4		10/06/20	Soil																				1	
	TP25_0.7		10/06/20	Soil																				1	
	TP26_0.35		10/06/20	Soil		1																		1	
	TP26_0.40		10/06/20	Soil																				1	
	TP27_0.35		10/06/20	Soil		1																		1	
	TP27_0.45		10/06/20	Soil																				1	
	TP28_0.3		10/06/20	Soil		1																		1	
	TP28_0.35		10/06/20	Soil																				1	
	TP28_0.45		10/06/20	Soil		1																		1	
	TP29_0.35		10/06/20	Soil		1																		1	
	TP29_0.4		10/06/20	Soil																				1	
	TP29_0.6		10/06/20	Soil																				1	
	TP29_0.8		10/06/20	Soil																				1	
	TP29_1.0		10/06/20	Soil		1																		1	
	QA11		10/06/20	Soil																				1	
	QA13		10/06/20	Soil		1																		1	
	QA15		11/06/20	Soil		1																		1	
	QA17		11/06/20	Soil																				1	
	QA19		11/06/20	Soil		1																		1	
	RB05		10/06/20	Water		1																1			
	RB06		11/06/20	Water		1																1			
	TB05		10/06/20	water			1																2		
	TB06		11/06/20	water			1																2		

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SP01		11/06/20	Soil		1																				1				
SP02		11/06/20	Soil		1																				1				
SP03		11/06/20	Soil		1																				1				
SP04		11/06/20	Soil		1																				1				
SP05		11/06/20	Soil		1																				1				
SP06		11/06/20	Soil		1																				1				
SP07		11/06/20	Soil		1																				1				
SP08		11/06/20	Soil		1																				1				
SP09		11/06/20	Soil		1																				1				
SP10		11/06/20	Soil		1																				1				
SP11		11/06/20	Soil																						1				
SP12		11/06/20	Soil																						1				
Add new rows			Total Counts		39	2																	2	4		81			

Method of Shipment	Courier (#	)	Hand Delivered		Postal		Name	Robin Birua		Signature				Date												Time			
Eurofins | mgt Laboratory Use Only	Received By	Jake		SYD | BNE | MEL | PER | ADL | NTL | DRW			Signature			Date: 12/06/2020			Time	9:00											Temperature			
	Received By			SYD | BNE | MEL | PER | ADL | NTL | DRW			Signature			Date			Time											Report №	725276		

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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

PROJECT INFORMATION

Date Received: _____

Company: Greencap NT

Contact person: _____

Contact Number: _____

Contact E-mail: _____

Project Name/site: _____

_____

Project Number: J168829

DRAFT

COC: **Attached** ☐
E-mailed ☐
Not received ☐

No ice

18.3
12/6/20
9.00am

eurofins | Environment Testing

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

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**Greencap NT P/L**
Contact name:	Stuart Carroll
Project name:	One Rail - Diesel Spill Investigation
Project ID:	J168829
COC number:	Not provided
Turn around time:	1 Day
Date/Time received:	Jun 12, 2020 9:00 AM
Eurofins reference:	**725276**

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

TP27_0.35 - Received limited sample. Samples TP27_0.45, TP28_0.30 and NDTP06_0.0 were not received. Extra samples TP16_0.0, TP24_0.6 and TP29_1.2.

Contact notes

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

Michael Morrison on Phone : 03 8564 5933 or by e.mail: MichaelMorrison@eurofins.com

Results will be delivered electronically via e.mail to Stuart Carroll - stuart.carroll@greencap.com.au.

Note: A copy of these results will also be delivered to the general Greencap NT P/L email address.

DRAFT

Greencap NT P/L
11/14 Winnellie Road
Winnellie
NT 0800

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Stuart Carroll**

Report **725276-S**
Project name One Rail - Diesel Spill Investigation
Project ID J168829
Received Date Jun 12, 2020

Client Sample ID			**NDTP01_0.5**	**NDTP02_0.5**	**NDTP03_0.5**	**NDTP04_0.6**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M20-Jn21222**	**M20-Jn21223**	**M20-Jn21224**	**M20-Jn21225**
Date Sampled			**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**
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-C36 (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	%	139	131	102	104
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
% Moisture	1	%	10	7.9	7.4	2.4

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Client Sample ID			NDTP05_0.2	NDTP06_0.35	TP11_0.35	TP11_0.80
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn21226	M20-Jn21227	M20-Jn21228	M20-Jn21229
Date Sampled			Jun 10, 2020	Jun 10, 2020	Jun 10, 2020	Jun 10, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 200	< 20	< 40	< 20
TRH C10-C14	20	mg/kg	11000	< 20	4600	47
TRH C15-C28	50	mg/kg	23000	< 50	10000	150
TRH C29-C36	50	mg/kg	< 250	64	1000	< 50
TRH C10-C36 (Total)	50	mg/kg	34000	64	15600	197
BTEX						
Benzene	0.1	mg/kg	< 1	< 0.1	< 0.2	< 0.1
Toluene	0.1	mg/kg	< 1	< 0.1	< 0.2	< 0.1
Ethylbenzene	0.1	mg/kg	2.3	< 0.1	< 0.2	< 0.1
m&p-Xylenes	0.2	mg/kg	11	< 0.2	3.2	< 0.2
o-Xylene	0.1	mg/kg	7.4	< 0.1	2.2	< 0.1
Xylenes - Total*	0.3	mg/kg	18	< 0.3	5.4	< 0.3
4-Bromofluorobenzene (surr.)	1	%	97	106	106	86
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 10	< 0.5	1.5	< 0.5
TRH C6-C10	20	mg/kg	< 200	< 20	110	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 200	< 20	100	< 20
TRH >C10-C16	50	mg/kg	17000	< 50	7200	90
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	17000	< 50	7198.5	90
TRH >C16-C34	100	mg/kg	15000	< 100	7800	120
TRH >C34-C40	100	mg/kg	< 500	< 100	730	< 100
TRH >C10-C40 (total)*	100	mg/kg	32000	< 100	15730	210
% Moisture	1	%	4.9	7.1	9.0	11

Client Sample ID			TP12_0.0	TP12_0.6	TP15_0.3	TP18_00
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn21230	M20-Jn21231	M20-Jn21232	M20-Jn21233
Date Sampled			Jun 10, 2020	Jun 10, 2020	Jun 10, 2020	Jun 10, 2020
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	210	170
TRH C15-C28	50	mg/kg	86	< 50	2000	2000
TRH C29-C36	50	mg/kg	170	< 50	440	< 50
TRH C10-C36 (Total)	50	mg/kg	256	< 50	2650	2170
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	%	94	81	87	92

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Client Sample ID			TP12_0.0	TP12_0.6	TP15_0.3	TP18_00
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn21230	M20-Jn21231	M20-Jn21232	M20-Jn21233
Date Sampled			Jun 10, 2020	Jun 10, 2020	Jun 10, 2020	Jun 10, 2020
Test/Reference	LOR	Unit				
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	610	550
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	610	550
TRH >C16-C34	100	mg/kg	170	< 100	1900	1600
TRH >C34-C40	100	mg/kg	250	< 100	240	< 100
TRH >C10-C40 (total)*	100	mg/kg	420	< 100	2750	2150
% Moisture	1	%	< 1	11	8.2	2.3

Client Sample ID			TP18_0.1	TP19_0.35	TP20_0.9	TP21_0.35
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn21234	M20-Jn21235	M20-Jn21236	M20-Jn21237
Date Sampled			Jun 10, 2020	Jun 10, 2020	Jun 10, 2020	Jun 10, 2020
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	110	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	1400	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	1510	< 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	%	94	85	76	88
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	360	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	360	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	1100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	1460	< 100	< 100	< 100
% Moisture	1	%	5.5	15	8.7	6.0

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Client Sample ID			TP22_0.35	TP24_0.3	TP26_0.35	TP27_0.35
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn21238	M20-Jn21239	M20-Jn21240	M20-Jn21241
Date Sampled			Jun 10, 2020	Jun 10, 2020	Jun 10, 2020	Jun 10, 2020
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	340
TRH C15-C28	50	mg/kg	< 50	440	< 50	860
TRH C29-C36	50	mg/kg	< 50	870	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	1310	< 50	1200
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	0.2
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	0.4
4-Bromofluorobenzene (surr.)	1	%	76	83	85	78
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	600
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	600
TRH >C16-C34	100	mg/kg	< 100	1000	< 100	570
TRH >C34-C40	100	mg/kg	< 100	490	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	1490	< 100	1170
% Moisture	1	%	8.2	6.9	5.4	2.7

Client Sample ID			TP28_0.45	TP29_0.35	TP29_1.0	QA13
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn21242	M20-Jn21243	M20-Jn21244	M20-Jn21245
Date Sampled			Jun 10, 2020	Jun 10, 2020	Jun 10, 2020	Jun 10, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 200	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	4900	25	130
TRH C15-C28	50	mg/kg	< 50	12000	75	1200
TRH C29-C36	50	mg/kg	< 50	< 250	< 50	260
TRH C10-C36 (Total)	50	mg/kg	< 50	16900	100	1590
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	57	58	74	70

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Client Sample ID			TP28_0.45	TP29_0.35	TP29_1.0	QA13
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn21242	M20-Jn21243	M20-Jn21244	M20-Jn21245
Date Sampled			Jun 10, 2020	Jun 10, 2020	Jun 10, 2020	Jun 10, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 200	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 200	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	8000	< 50	370
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	8000	< 50	370
TRH >C16-C34	100	mg/kg	< 100	8000	< 100	1100
TRH >C34-C40	100	mg/kg	< 100	< 500	< 100	130
TRH >C10-C40 (total)*	100	mg/kg	< 100	16000	< 100	1600
% Moisture	1	%	10	7.8	10	7.6

Client Sample ID			QA15	QA19	SP01	SP02
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn21246	M20-Jn21247	M20-Jn21252	M20-Jn21253
Date Sampled			Jun 11, 2020	Jun 11, 2020	Jun 11, 2020	Jun 11, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 200	< 200	< 200
TRH C10-C14	20	mg/kg	< 20	16000	16000	13000
TRH C15-C28	50	mg/kg	< 50	36000	36000	41000
TRH C29-C36	50	mg/kg	< 50	< 500	< 500	< 500
TRH C10-C36 (Total)	50	mg/kg	< 50	52000	52000	54000
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 1	< 1	< 1
Toluene	0.1	mg/kg	< 0.1	< 1	< 1	< 1
Ethylbenzene	0.1	mg/kg	< 0.1	2.0	2.0	< 1
m&p-Xylenes	0.2	mg/kg	< 0.2	6.8	7.1	3.3
o-Xylene	0.1	mg/kg	< 0.1	4.8	4.8	2.1
Xylenes - Total*	0.3	mg/kg	< 0.3	12	12	5.4
4-Bromofluorobenzene (surr.)	1	%	75	79	75	86
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 10	< 10	< 10
TRH C6-C10	20	mg/kg	< 20	< 200	< 200	< 200
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 200	< 200	< 200
TRH >C10-C16	50	mg/kg	< 50	26000	26000	24000
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	26000	26000	24000
TRH >C16-C34	100	mg/kg	< 100	23000	23000	28000
TRH >C34-C40	100	mg/kg	< 100	< 1000	< 1000	< 1000
TRH >C10-C40 (total)*	100	mg/kg	< 100	49000	49000	52000
% Moisture	1	%	8.7	6.0	5.1	2.2

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Client Sample ID			SP03	SP04	SP05	SP06
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn21254	M20-Jn21255	M20-Jn21256	M20-Jn21257
Date Sampled			Jun 11, 2020	Jun 11, 2020	Jun 11, 2020	Jun 11, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 200	< 400	< 400	< 400
TRH C10-C14	20	mg/kg	16000	8800	5500	16000
TRH C15-C28	50	mg/kg	36000	24000	16000	38000
TRH C29-C36	50	mg/kg	< 500	< 250	< 250	< 500
TRH C10-C36 (Total)	50	mg/kg	52000	32800	21500	54000
BTEX						
Benzene	0.1	mg/kg	< 1	< 2	< 2	< 2
Toluene	0.1	mg/kg	< 1	< 2	< 2	< 2
Ethylbenzene	0.1	mg/kg	2.9	< 2	< 2	< 2
m&p-Xylenes	0.2	mg/kg	10	< 4	< 4	5.7
o-Xylene	0.1	mg/kg	6.5	< 2	< 2	4.2
Xylenes - Total*	0.3	mg/kg	16	< 6	< 6	9.9
4-Bromofluorobenzene (surr.)	1	%	106	51	86	137
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 10	< 10	< 10	< 10
TRH C6-C10	20	mg/kg	< 200	< 400	< 400	460
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 200	< 400	< 400	450
TRH >C10-C16	50	mg/kg	26000	16000	9900	27000
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	26000	16000	9900	27000
TRH >C16-C34	100	mg/kg	24000	16000	11000	25000
TRH >C34-C40	100	mg/kg	< 1000	< 500	< 500	< 1000
TRH >C10-C40 (total)*	100	mg/kg	50000	32000	20900	52000
% Moisture	1	%	3.3	3.7	2.0	2.9

Client Sample ID			SP07	SP08	SP09	SP10
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn21258	M20-Jn21259	M20-Jn21260	M20-Jn21261
Date Sampled			Jun 11, 2020	Jun 11, 2020	Jun 11, 2020	Jun 11, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 400	< 100	< 100	< 100
TRH C10-C14	20	mg/kg	8100	4400	2400	2400
TRH C15-C28	50	mg/kg	28000	12000	7200	6500
TRH C29-C36	50	mg/kg	< 250	< 250	< 250	< 250
TRH C10-C36 (Total)	50	mg/kg	36100	16400	9600	8900
BTEX						
Benzene	0.1	mg/kg	< 2	< 0.5	< 0.5	< 0.5
Toluene	0.1	mg/kg	< 2	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.1	mg/kg	< 2	< 0.5	< 0.5	< 0.5
m&p-Xylenes	0.2	mg/kg	< 4	< 1	< 1	< 1
o-Xylene	0.1	mg/kg	3.2	0.8	0.6	< 0.5
Xylenes - Total*	0.3	mg/kg	< 6	< 1.5	< 1.5	< 1.5
4-Bromofluorobenzene (surr.)	1	%	68	102	111	103

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Client Sample ID			SP07	SP08	SP09	SP10
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn21258	M20-Jn21259	M20-Jn21260	M20-Jn21261
Date Sampled			Jun 11, 2020	Jun 11, 2020	Jun 11, 2020	Jun 11, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 10	< 2.5	< 2.5	< 2.5
TRH C6-C10	20	mg/kg	< 400	< 100	< 100	< 100
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 400	< 100	< 100	< 100
TRH >C10-C16	50	mg/kg	16000	7800	4300	4200
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	16000	7800	4300	4200
TRH >C16-C34	100	mg/kg	19000	8200	5000	4400
TRH >C34-C40	100	mg/kg	< 500	< 500	< 500	< 500
TRH >C10-C40 (total)*	100	mg/kg	35000	16000	9300	8600
% Moisture	1	%	2.2	5.1	4.3	4.3

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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
Eurofins | mgt Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jun 12, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Jun 12, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 12, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 12, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
% Moisture	Melbourne	Jun 12, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

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Company Name: Greencap NT P/L
Address: 11/14 Winnellie Road
Winnellie
NT 0800

Project Name: One Rail - Diesel Spill Investigation
Project ID: J168829

Order No.:
Report #: 725276
Phone: 61 8 8984 4244
Fax: 61 8 8984 3105

Received: Jun 12, 2020 9:00 AM
Due: Jun 15, 2020
Priority: 1 Day
Contact Name: Stuart Carroll

Eurofins Analytical Services Manager : Michael Morrison

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Sample Detail						HOLD	Total Recoverable Hydrocarbons - 1999 NEPM Fractions	BTEX	Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	NDTP01_0.5	Jun 10, 2020		Soil	M20-Jn21222					X	X
2	NDTP02_0.5	Jun 10, 2020		Soil	M20-Jn21223					X	X
3	NDTP03_0.5	Jun 10, 2020		Soil	M20-Jn21224					X	X
4	NDTP04_0.6	Jun 10, 2020		Soil	M20-Jn21225					X	X
5	NDTP05_0.2	Jun 10, 2020		Soil	M20-Jn21226					X	X
6	NDTP06_0.35	Jun 10, 2020		Soil	M20-Jn21227					X	X
7	TP11_0.35	Jun 10, 2020		Soil	M20-Jn21228					X	X
8	TP11_0.80	Jun 10, 2020		Soil	M20-Jn21229					X	X
9	TP12_0.0	Jun 10, 2020		Soil	M20-Jn21230					X	X
10	TP12_0.6	Jun 10, 2020		Soil	M20-Jn21231					X	X

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Company Name: Greencap NT P/L
Address: 11/14 Winnellie Road
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NT 0800

Project Name: One Rail - Diesel Spill Investigation
Project ID: J168829

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Sample Detail						HOLD	Total Recoverable Hydrocarbons - 1999 NEPM Fractions	BTEX	Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
11	TP15_0.3	Jun 10, 2020		Soil	M20-Jn21232					X	X
12	TP18_00	Jun 10, 2020		Soil	M20-Jn21233					X	X
13	TP18_0.1	Jun 10, 2020		Soil	M20-Jn21234					X	X
14	TP19_0.35	Jun 10, 2020		Soil	M20-Jn21235					X	X
15	TP20_0.9	Jun 10, 2020		Soil	M20-Jn21236					X	X
16	TP21_0.35	Jun 10, 2020		Soil	M20-Jn21237					X	X
17	TP22_0.35	Jun 10, 2020		Soil	M20-Jn21238					X	X
18	TP24_0.3	Jun 10, 2020		Soil	M20-Jn21239					X	X
19	TP26_0.35	Jun 10, 2020		Soil	M20-Jn21240					X	X
20	TP27_0.35	Jun 10, 2020		Soil	M20-Jn21241					X	X
21	TP28_0.45	Jun 10, 2020		Soil	M20-Jn21242					X	X
22	TP29_0.35	Jun 10, 2020		Soil	M20-Jn21243					X	X
23	TP29_1.0	Jun 10, 2020		Soil	M20-Jn21244					X	X

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Project ID: J168829

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Sample Detail						HOLD	Total Recoverable Hydrocarbons - 1999 NEPM Fractions	BTEX	Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
24	QA13	Jun 10, 2020		Soil	M20-Jn21245					X	X
25	QA15	Jun 11, 2020		Soil	M20-Jn21246					X	X
26	QA19	Jun 11, 2020		Soil	M20-Jn21247					X	X
27	RB05	Jun 10, 2020		Water	M20-Jn21248		X		X		
28	RB06	Jun 11, 2020		Water	M20-Jn21249		X		X		
29	TB05	Jun 10, 2020		Water	M20-Jn21250			X			
30	TB06	Jun 11, 2020		Water	M20-Jn21251			X			
31	SP01	Jun 11, 2020		Soil	M20-Jn21252					X	X
32	SP02	Jun 11, 2020		Soil	M20-Jn21253					X	X
33	SP03	Jun 11, 2020		Soil	M20-Jn21254					X	X
34	SP04	Jun 11, 2020		Soil	M20-Jn21255					X	X
35	SP05	Jun 11, 2020		Soil	M20-Jn21256					X	X
36	SP06	Jun 11, 2020		Soil	M20-Jn21257					X	X

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Phone : 0800 856 450
IANZ # 1290

Company Name: Greencap NT P/L
Address: 11/14 Winnellie Road
Winnellie
NT 0800

Project Name: One Rail - Diesel Spill Investigation
Project ID: J168829

Order No.:
Report #: 725276
Phone: 61 8 8984 4244
Fax: 61 8 8984 3105

Received: Jun 12, 2020 9:00 AM
Due: Jun 15, 2020
Priority: 1 Day
Contact Name: Stuart Carroll

Eurofins Analytical Services Manager : Michael Morrison

DRAFT

Sample Detail						HOLD	Total Recoverable Hydrocarbons - 1999 NEPM Fractions	BTEX	Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
37	SP07	Jun 11, 2020		Soil	M20-Jn21258					X	X
38	SP08	Jun 11, 2020		Soil	M20-Jn21259					X	X
39	SP09	Jun 11, 2020		Soil	M20-Jn21260					X	X
40	SP10	Jun 11, 2020		Soil	M20-Jn21261					X	X
41	NDTP01_0.0	Jun 10, 2020		Soil	M20-Jn21262	X					
42	NDTP03_0.0	Jun 10, 2020		Soil	M20-Jn21263	X					
43	NDTP04_0.1	Jun 10, 2020		Soil	M20-Jn21264	X					
44	TP11_0.55	Jun 10, 2020		Soil	M20-Jn21265	X					
45	TP12_0.2	Jun 10, 2020		Soil	M20-Jn21266	X					
46	TP13_0.0	Jun 10, 2020		Soil	M20-Jn21267	X					
47	TP13_0.35	Jun 10, 2020		Soil	M20-Jn21268	X					
48	TP13_0.6	Jun 10, 2020		Soil	M20-Jn21269	X					
49	TP13_1.0	Jun 10, 2020		Soil	M20-Jn21270	X					

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Site # 1254 & 14271

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NATA # 1261 Site # 20794

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Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
50	TP14_0.0	Jun 10, 2020		Soil	M20-Jn21271	X					
51	TP14_0.2	Jun 10, 2020		Soil	M20-Jn21272	X					
52	TP_0.4	Jun 10, 2020		Soil	M20-Jn21273	X					
53	TP16_0.35	Jun 10, 2020		Soil	M20-Jn21274	X					
54	TP16_0.45	Jun 10, 2020		Soil	M20-Jn21275	X					
55	TP16_0.7	Jun 10, 2020		Soil	M20-Jn21276	X					
56	TP16_1.0	Jun 10, 2020		Soil	M20-Jn21277	X					
57	TP17 (1)	Jun 10, 2020		Soil	M20-Jn21278	X					
58	TP17 (2)	Jun 10, 2020		Soil	M20-Jn21279	X					
59	TP17_0.9	Jun 10, 2020		Soil	M20-Jn21280	X					
60	TP19_0.0	Jun 10, 2020		Soil	M20-Jn21281	X					
61	TP19_1.2	Jun 10, 2020		Soil	M20-Jn21282	X					
62	TP20_0.0	Jun 10, 2020		Soil	M20-Jn21283	X					

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Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
63	TP20_0.4	Jun 10, 2020		Soil	M20-Jn21284	X					
64	TP20_1.3	Jun 10, 2020		Soil	M20-Jn21285	X					
65	TP21_0.4	Jun 10, 2020		Soil	M20-Jn21286	X					
66	TP21_0.6	Jun 10, 2020		Soil	M20-Jn21287	X					
67	TP22_0.6	Jun 10, 2020		Soil	M20-Jn21288	X					
68	TP23_0.30	Jun 10, 2020		Soil	M20-Jn21289	X					
69	TP23_0.35	Jun 10, 2020		Soil	M20-Jn21290	X					
70	TP23_0.6	Jun 10, 2020		Soil	M20-Jn21291	X					
71	TP24_0.35	Jun 10, 2020		Soil	M20-Jn21292	X					
72	TP25_0.35	Jun 10, 2020		Soil	M20-Jn21293	X					
73	TP25_0.4	Jun 10, 2020		Soil	M20-Jn21294	X					
74	TP25_0.7	Jun 10, 2020		Soil	M20-Jn21295	X					
75	TP26_0.40	Jun 10, 2020		Soil	M20-Jn21296	X					

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
76	TP28_0.35	Jun 10, 2020		Soil	M20-Jn21297	X					
77	TP29_0.4	Jun 10, 2020		Soil	M20-Jn21298	X					
78	TP29_0.6	Jun 10, 2020		Soil	M20-Jn21299	X					
79	TP29_0.8	Jun 10, 2020		Soil	M20-Jn21300	X					
80	QA11	Jun 10, 2020		Soil	M20-Jn21301	X					
81	QA17	Jun 11, 2020		Soil	M20-Jn21302	X					
82	SP11	Jun 11, 2020		Soil	M20-Jn21303	X					
83	SP12	Jun 11, 2020		Soil	M20-Jn21304	X					
84	TP16_0.0	Jun 10, 2020		Soil	M20-Jn21305	X					
85	TP24_0.6	Jun 10, 2020		Soil	M20-Jn21306	X					
86	TP29_1.2	Jun 10, 2020		Soil	M20-Jn21307	X					
Test Counts						46	2	2	2	36	36

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

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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							
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	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	86			70-130	Pass	
TRH C10-C14	%	104			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	95			70-130	Pass	
Toluene	%	93			70-130	Pass	
Ethylbenzene	%	96			70-130	Pass	
m&p-Xylenes	%	96			70-130	Pass	
Xylenes - Total*	%	96			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	124			70-130	Pass	
TRH C6-C10	%	82			70-130	Pass	
TRH >C10-C16	%	98			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	M20-Jn21230	CP	%	109			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M20-Jn21230	CP	%	102			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M20-Jn21231	CP	%	74			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M20-Jn21231	CP	%	84			70-130	Pass	
Toluene	M20-Jn21231	CP	%	82			70-130	Pass	

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Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Ethylbenzene	M20-Jn21231	CP	%	84			70-130	Pass	
m&p-Xylenes	M20-Jn21231	CP	%	71			70-130	Pass	
o-Xylene	M20-Jn21231	CP	%	72			70-130	Pass	
Xylenes - Total*	M20-Jn21231	CP	%	72			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M20-Jn21231	CP	%	92			70-130	Pass	
TRH C6-C10	M20-Jn21231	CP	%	71			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M20-Jn21240	CP	%	108			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M20-Jn21240	CP	%	103			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M20-Jn21229	CP	mg/kg	47	41	13	30%	Pass	
TRH C15-C28	M20-Jn21229	CP	mg/kg	150	120	25	30%	Pass	
TRH C29-C36	M20-Jn21229	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M20-Jn21229	CP	mg/kg	90	72	23	30%	Pass	
TRH >C16-C34	M20-Jn21229	CP	mg/kg	120	< 100	28	30%	Pass	
TRH >C34-C40	M20-Jn21229	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M20-Jn21230	CP	%	< 1	< 1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M20-Jn21239	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M20-Jn21239	CP	mg/kg	440	240	57	30%	Fail	Q15
TRH C29-C36	M20-Jn21239	CP	mg/kg	870	480	57	30%	Fail	Q15
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M20-Jn21239	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M20-Jn21239	CP	mg/kg	1000	560	58	30%	Fail	Q15
TRH >C34-C40	M20-Jn21239	CP	mg/kg	490	280	54	30%	Fail	Q15
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M20-Jn21240	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M20-Jn21240	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M20-Jn21240	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M20-Jn21240	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M20-Jn21240	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M20-Jn21240	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	M20-Jn21240	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M20-Jn21240	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M20-Jn21240	CP	mg/kg	< 20	< 20	<1	30%	Pass	

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Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M20-Jn21240	CP	%	5.4	6.5	19	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M20-Jn21254	CP	%	3.3	3.4	3.0	30%	Pass	

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

Authorised By

Michael Morrison	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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DRAFT

Greencap NT P/L
11/14 Winnellie Road
Winnellie
NT 0800

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Stuart Carroll**

Report **725276-W**
Project name One Rail - Diesel Spill Investigation
Project ID J168829
Received Date Jun 12, 2020

Client Sample ID			**RB05**	**RB06**	**TB05**	**TB06**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**M20-Jn21248**	**M20-Jn21249**	**M20-Jn21250**	**M20-Jn21251**
Date Sampled			**Jun 10, 2020**	**Jun 11, 2020**	**Jun 10, 2020**	**Jun 11, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	-	-
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	-	-
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	-	-
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	-	-
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	-	-
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	-	-
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	-	-
BTEX						
Benzene	0.001	mg/L	-	-	< 0.001	< 0.001
Toluene	0.001	mg/L	-	-	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	-	-	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	-	-	< 0.002	< 0.002
o-Xylene	0.001	mg/L	-	-	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	-	-	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	-	-	102	74

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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
Eurofins | mgt Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jun 12, 2020	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 12, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Jun 12, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			

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Company Name: Greencap NT P/L
Address: 11/14 Winnellie Road
Winnellie
NT 0800

Project Name: One Rail - Diesel Spill Investigation
Project ID: J168829

Order No.:
Report #: 725276
Phone: 61 8 8984 4244
Fax: 61 8 8984 3105

Received: Jun 12, 2020 9:00 AM
Due: Jun 15, 2020
Priority: 1 Day
Contact Name: Stuart Carroll

Eurofins Analytical Services Manager : Michael Morrison

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Sample Detail						HOLD	Total Recoverable Hydrocarbons - 1999 NEPM Fractions	BTEX	Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	NDTP01_0.5	Jun 10, 2020		Soil	M20-Jn21222					X	X
2	NDTP02_0.5	Jun 10, 2020		Soil	M20-Jn21223					X	X
3	NDTP03_0.5	Jun 10, 2020		Soil	M20-Jn21224					X	X
4	NDTP04_0.6	Jun 10, 2020		Soil	M20-Jn21225					X	X
5	NDTP05_0.2	Jun 10, 2020		Soil	M20-Jn21226					X	X
6	NDTP06_0.35	Jun 10, 2020		Soil	M20-Jn21227					X	X
7	TP11_0.35	Jun 10, 2020		Soil	M20-Jn21228					X	X
8	TP11_0.80	Jun 10, 2020		Soil	M20-Jn21229					X	X
9	TP12_0.0	Jun 10, 2020		Soil	M20-Jn21230					X	X
10	TP12_0.6	Jun 10, 2020		Soil	M20-Jn21231					X	X

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
11	TP15_0.3	Jun 10, 2020		Soil	M20-Jn21232					X	X
12	TP18_00	Jun 10, 2020		Soil	M20-Jn21233					X	X
13	TP18_0.1	Jun 10, 2020		Soil	M20-Jn21234					X	X
14	TP19_0.35	Jun 10, 2020		Soil	M20-Jn21235					X	X
15	TP20_0.9	Jun 10, 2020		Soil	M20-Jn21236					X	X
16	TP21_0.35	Jun 10, 2020		Soil	M20-Jn21237					X	X
17	TP22_0.35	Jun 10, 2020		Soil	M20-Jn21238					X	X
18	TP24_0.3	Jun 10, 2020		Soil	M20-Jn21239					X	X
19	TP26_0.35	Jun 10, 2020		Soil	M20-Jn21240					X	X
20	TP27_0.35	Jun 10, 2020		Soil	M20-Jn21241					X	X
21	TP28_0.45	Jun 10, 2020		Soil	M20-Jn21242					X	X
22	TP29_0.35	Jun 10, 2020		Soil	M20-Jn21243					X	X
23	TP29_1.0	Jun 10, 2020		Soil	M20-Jn21244					X	X

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
24	QA13	Jun 10, 2020		Soil	M20-Jn21245					X	X
25	QA15	Jun 11, 2020		Soil	M20-Jn21246					X	X
26	QA19	Jun 11, 2020		Soil	M20-Jn21247					X	X
27	RB05	Jun 10, 2020		Water	M20-Jn21248		X		X		
28	RB06	Jun 11, 2020		Water	M20-Jn21249		X		X		
29	TB05	Jun 10, 2020		Water	M20-Jn21250			X			
30	TB06	Jun 11, 2020		Water	M20-Jn21251			X			
31	SP01	Jun 11, 2020		Soil	M20-Jn21252					X	X
32	SP02	Jun 11, 2020		Soil	M20-Jn21253					X	X
33	SP03	Jun 11, 2020		Soil	M20-Jn21254					X	X
34	SP04	Jun 11, 2020		Soil	M20-Jn21255					X	X
35	SP05	Jun 11, 2020		Soil	M20-Jn21256					X	X
36	SP06	Jun 11, 2020		Soil	M20-Jn21257					X	X

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
37	SP07	Jun 11, 2020		Soil	M20-Jn21258					X	X
38	SP08	Jun 11, 2020		Soil	M20-Jn21259					X	X
39	SP09	Jun 11, 2020		Soil	M20-Jn21260					X	X
40	SP10	Jun 11, 2020		Soil	M20-Jn21261					X	X
41	NDTP01_0.0	Jun 10, 2020		Soil	M20-Jn21262	X					
42	NDTP03_0.0	Jun 10, 2020		Soil	M20-Jn21263	X					
43	NDTP04_0.1	Jun 10, 2020		Soil	M20-Jn21264	X					
44	TP11_0.55	Jun 10, 2020		Soil	M20-Jn21265	X					
45	TP12_0.2	Jun 10, 2020		Soil	M20-Jn21266	X					
46	TP13_0.0	Jun 10, 2020		Soil	M20-Jn21267	X					
47	TP13_0.35	Jun 10, 2020		Soil	M20-Jn21268	X					
48	TP13_0.6	Jun 10, 2020		Soil	M20-Jn21269	X					
49	TP13_1.0	Jun 10, 2020		Soil	M20-Jn21270	X					

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
50	TP14_0.0	Jun 10, 2020		Soil	M20-Jn21271	X					
51	TP14_0.2	Jun 10, 2020		Soil	M20-Jn21272	X					
52	TP_0.4	Jun 10, 2020		Soil	M20-Jn21273	X					
53	TP16_0.35	Jun 10, 2020		Soil	M20-Jn21274	X					
54	TP16_0.45	Jun 10, 2020		Soil	M20-Jn21275	X					
55	TP16_0.7	Jun 10, 2020		Soil	M20-Jn21276	X					
56	TP16_1.0	Jun 10, 2020		Soil	M20-Jn21277	X					
57	TP17 (1)	Jun 10, 2020		Soil	M20-Jn21278	X					
58	TP17 (2)	Jun 10, 2020		Soil	M20-Jn21279	X					
59	TP17_0.9	Jun 10, 2020		Soil	M20-Jn21280	X					
60	TP19_0.0	Jun 10, 2020		Soil	M20-Jn21281	X					
61	TP19_1.2	Jun 10, 2020		Soil	M20-Jn21282	X					
62	TP20_0.0	Jun 10, 2020		Soil	M20-Jn21283	X					

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
63	TP20_0.4	Jun 10, 2020		Soil	M20-Jn21284	X					
64	TP20_1.3	Jun 10, 2020		Soil	M20-Jn21285	X					
65	TP21_0.4	Jun 10, 2020		Soil	M20-Jn21286	X					
66	TP21_0.6	Jun 10, 2020		Soil	M20-Jn21287	X					
67	TP22_0.6	Jun 10, 2020		Soil	M20-Jn21288	X					
68	TP23_0.30	Jun 10, 2020		Soil	M20-Jn21289	X					
69	TP23_0.35	Jun 10, 2020		Soil	M20-Jn21290	X					
70	TP23_0.6	Jun 10, 2020		Soil	M20-Jn21291	X					
71	TP24_0.35	Jun 10, 2020		Soil	M20-Jn21292	X					
72	TP25_0.35	Jun 10, 2020		Soil	M20-Jn21293	X					
73	TP25_0.4	Jun 10, 2020		Soil	M20-Jn21294	X					
74	TP25_0.7	Jun 10, 2020		Soil	M20-Jn21295	X					
75	TP26_0.40	Jun 10, 2020		Soil	M20-Jn21296	X					

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
76	TP28_0.35	Jun 10, 2020		Soil	M20-Jn21297	X					
77	TP29_0.4	Jun 10, 2020		Soil	M20-Jn21298	X					
78	TP29_0.6	Jun 10, 2020		Soil	M20-Jn21299	X					
79	TP29_0.8	Jun 10, 2020		Soil	M20-Jn21300	X					
80	QA11	Jun 10, 2020		Soil	M20-Jn21301	X					
81	QA17	Jun 11, 2020		Soil	M20-Jn21302	X					
82	SP11	Jun 11, 2020		Soil	M20-Jn21303	X					
83	SP12	Jun 11, 2020		Soil	M20-Jn21304	X					
84	TP16_0.0	Jun 10, 2020		Soil	M20-Jn21305	X					
85	TP24_0.6	Jun 10, 2020		Soil	M20-Jn21306	X					
86	TP29_1.2	Jun 10, 2020		Soil	M20-Jn21307	X					
Test Counts						46	2	2	2	36	36

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.

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Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C10-C14	%	81			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	82			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	102			70-130	Pass	
Toluene	%	100			70-130	Pass	
Ethylbenzene	%	97			70-130	Pass	
m&p-Xylenes	%	96			70-130	Pass	
Xylenes - Total*	%	97			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	B20-Jn18078	NCP	%	79			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	B20-Jn18078	NCP	%	76			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	P20-Jn11084	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	P20-Jn11084	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	P20-Jn11084	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	P20-Jn11084	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	P20-Jn11084	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	P20-Jn11084	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

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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

Authorised By

Michael Morrison	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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.

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CHAIN OF CUSTODY RECORD

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

Company	Greencap NT P/L	Project №	J168829	Project Manager	Stuart Carroll
Address	11/14 Winnellie Road, Winnellie, NT, 0800	Project Name	One Rail - Diesel Spill Investigation	EDD Format (ESdat, EQuIS etc)	
Contact Name	Stuart Carroll				
Phone №	0466 776 038				
Special Directions					
Purchase Order	275691				
Quote ID №					

Sampler(s)	Staurt Carroll
Handed over by	Stuart Carroll
Email for Results	Stuart.Carroll@greencap.com.au & robin.birua@greencap.com.au

Containers (Change container type & size if necessary)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked)

♦Surcharge will apply
☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☑ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☐ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Date	Matrix (Solid (S) Water (W))	Suite B1	BTEX	500mL Plastic - Unpreserved	500mL Plastic - Sodium Thiosulfate	60mL Plastic - Metals	200mL Amber Glass	40mL VOA Glass Vvial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	TP27_0.35	11/06/20	Soil	1								1		
2	TP27_0.45	11/06/20	Soil									1		
3														
4	RB01	2/06/20	Water	1								1		
5	RB02	3/06/20	Water	1								1		
6	RB03	4/06/20	Water	1								1		
7	RB04	5/06/20	Water	1								1		
8														
9														
10														
11														
12														
	Add new rows		Total Counts	5								6		

24 Hr TAT Please

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Method of Shipment	Courier (#)	☑ Hand Delivered	Postal	Name	Robin Birua	Signature		Date		Time	
Eurofins | mgt Laboratory Use Only	Received By	Ashvin Desai	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date: 15/06/20		Time	2:45	Temperature	14.0C
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	275529

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

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

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

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**Greencap NT P/L**
Contact name:	Stuart Carroll
Project name:	ONE RAIL - DIESEL SPILL INVESTIGATION
Project ID:	J168829
COC number:	Not provided
Turn around time:	1 Day
Date/Time received:	Jun 15, 2020
Eurofins reference:	**725527**

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).

Contact notes

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

Michael Morrison on Phone : 03 8564 5933 or by e.mail: MichaelMorrison@eurofins.com

Results will be delivered electronically via e.mail to Stuart Carroll - stuart.carroll@greencap.com.au.

Note: A copy of these results will also be delivered to the general Greencap NT P/L email address.

DRAFT

Greencap NT P/L
11/14 Winnellie Road
Winnellie
NT 0800

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Stuart Carroll**

Report **725527-S-V2**
Project name ONE RAIL - DIESEL SPILL INVESTIGATION
Project ID J168829
Received Date Jun 15, 2020

Client Sample ID			**TP27A_0.35**	**TP27A_0.45**
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**M20-Jn23518**	**M20-Jn23519**
Date Sampled			**Jun 11, 2020**	**Jun 11, 2020**
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50
BTEX				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	67	55
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100
% Moisture	1	%	6.7	8.8

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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
Eurofins | mgt Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jun 16, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Jun 16, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 16, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 16, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
% Moisture	Melbourne	Jun 15, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

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eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
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Lane Cove West NSW 2066
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NATA # 1261 Site # 20794

Perth
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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Greencap NT P/L
Address: 11/14 Winnellie Road
Winnellie
NT 0800

Project Name: ONE RAIL - DIESEL SPILL INVESTIGATION
Project ID: J168829

Order No.: 275691
Report #: 725527
Phone: 61 8 8984 4244
Fax: 61 8 8984 3105

Received: Jun 15, 2020 12:00 AM
Due: Jun 16, 2020
Priority: 1 Day
Contact Name: Stuart Carroll

Eurofins Analytical Services Manager : Michael Morrison

Sample Detail						Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	TP27A_0.35	Jun 11, 2020		Soil	M20-Jn23518	X	X
2	TP27A_0.45	Jun 11, 2020		Soil	M20-Jn23519	X	X
3	RB01	Jun 02, 2020		Water	M20-Jn23520		X
4	RB02	Jun 03, 2020		Water	M20-Jn23521		X
5	RB03	Jun 04, 2020		Water	M20-Jn23522		X
6	RB04	Jun 05, 2020		Water	M20-Jn23523		X
Test Counts						2	6

DRAFT

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

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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.
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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.

DRAFT

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	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	118			70-130	Pass	
TRH C10-C14	%	101			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	100			70-130	Pass	
Toluene	%	107			70-130	Pass	
Ethylbenzene	%	101			70-130	Pass	
m&p-Xylenes	%	123			70-130	Pass	
Xylenes - Total*	%	116			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	83			70-130	Pass	
TRH C6-C10	%	94			70-130	Pass	
TRH >C10-C16	%	95			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 C6-C9	M20-Jn26140	NCP	%	127			70-130	Pass	
TRH C10-C14	M20-Jn22187	NCP	%	99			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M20-Jn26140	NCP	%	102			70-130	Pass	
Toluene	M20-Jn26140	NCP	%	115			70-130	Pass	
Ethylbenzene	M20-Jn26140	NCP	%	107			70-130	Pass	
m&p-Xylenes	M20-Jn26140	NCP	%	128			70-130	Pass	
o-Xylene	M20-Jn26140	NCP	%	103			70-130	Pass	
Xylenes - Total*	M20-Jn26140	NCP	%	119			70-130	Pass	
Spike - % Recovery									

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Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M20-Jn26140	NCP	%	80			70-130	Pass	
TRH C6-C10	M20-Jn26140	NCP	%	103			70-130	Pass	
TRH >C10-C16	M20-Jn22187	NCP	%	93			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M20-Jn22183	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M20-Jn20675	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M20-Jn20675	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M20-Jn20675	NCP	mg/kg	70	75	8.0	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M20-Jn22183	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M20-Jn22183	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M20-Jn22183	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M20-Jn22183	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M20-Jn22183	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	M20-Jn22183	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M20-Jn22183	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M20-Jn22183	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M20-Jn20675	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M20-Jn20675	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M20-Jn20675	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M20-Jn23518	CP	%	6.7	6.7	<1	30%	Pass	

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Comments

V2: This report has been amended with updated sample id's for samples M20-Jn23518 and M20-Jn23519 as requested by SC 22/6/20.

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.

Authorised By

Michael Morrison	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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Greencap NT P/L
11/14 Winnellie Road
Winnellie
NT 0800

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Stuart Carroll**

Report **725527-W-V2**
Project name ONE RAIL - DIESEL SPILL INVESTIGATION
Project ID J168829
Received Date Jun 15, 2020

Client Sample ID			**RB01**	**RB02**	**RB03**	**RB04**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**M20-Jn23520**	**M20-Jn23521**	**M20-Jn23522**	**M20-Jn23523**
Date Sampled			**Jun 02, 2020**	**Jun 03, 2020**	**Jun 04, 2020**	**Jun 05, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	92	98	88	98
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1

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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
Eurofins | mgt Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jun 16, 2020	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Jun 16, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 16, 2020	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 16, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			

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eurofins | Environment Testing

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Site # 1254 & 14271

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NATA # 1261 Site # 20794

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43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Greencap NT P/L
Address: 11/14 Winnellie Road
Winnellie
NT 0800

Project Name: ONE RAIL - DIESEL SPILL INVESTIGATION
Project ID: J168829

Order No.: 275691
Report #: 725527
Phone: 61 8 8984 4244
Fax: 61 8 8984 3105

Received: Jun 15, 2020 12:00 AM
Due: Jun 16, 2020
Priority: 1 Day
Contact Name: Stuart Carroll

Eurofins Analytical Services Manager : Michael Morrison

Sample Detail						Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	TP27A_0.35	Jun 11, 2020		Soil	M20-Jn23518	X	X
2	TP27A_0.45	Jun 11, 2020		Soil	M20-Jn23519	X	X
3	RB01	Jun 02, 2020		Water	M20-Jn23520		X
4	RB02	Jun 03, 2020		Water	M20-Jn23521		X
5	RB03	Jun 04, 2020		Water	M20-Jn23522		X
6	RB04	Jun 05, 2020		Water	M20-Jn23523		X
Test Counts						2	6

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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.

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Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	127			70-130	Pass	
TRH C10-C14	%	79			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	104			70-130	Pass	
Toluene	%	111			70-130	Pass	
Ethylbenzene	%	98			70-130	Pass	
m&p-Xylenes	%	120			70-130	Pass	
Xylenes - Total*	%	113			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	75			70-130	Pass	
TRH C6-C10	%	109			70-130	Pass	
TRH >C10-C16	%	75			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	M20-Jn20337	NCP	%	102			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M20-Jn20337	NCP	%	91			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M20-Jn22205	NCP	mg/L	0.28	0.28	1.0	30%	Pass	
TRH C15-C28	M20-Jn22205	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M20-Jn22205	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

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Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M20-Jn22205	NCP	mg/L	0.20	0.20	1.0	30%	Pass	
TRH >C16-C34	M20-Jn22205	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M20-Jn22205	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

DRAFT

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
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.

Authorised By

Michael Morrison	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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DRAFT

#AU_CAU001_EnviroSampleVic

From: Stuart Carroll <Stuart.Carroll@greencap.com.au>
Sent: Tuesday, 16 June 2020 3:22 PM
To: Michael Morrison; #AU_CAU001_EnviroSampleVic
Cc: Robin Birua
Subject: RE: [EXT]:RE: 724546 & 725276

Hi Michael,

Yes, please go ahead with it. 3 days is ok.

725863.

Stuart Carroll

Senior Consultant - Environment | Greencap

Unit 11 / 14 Winnellie Road Winnellie, NT 0820
D: 08 7906 1312 | M: 0466 776 038 | E: Stuart.Carroll@greencap.com.au | in: LinkedIn

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From: MichaelMorrison@eurofins.com <MichaelMorrison@eurofins.com>
Sent: Tuesday, 16 June 2020 2:03 PM
To: Stuart Carroll <Stuart.Carroll@greencap.com.au>; EnviroSampleVic@eurofins.com
Cc: Robin Birua <Robin.Birua@greencap.com.au>
Subject: [EXT]:RE: 724546 & 725276

CAUTION: This email originated from outside of the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Hi Stuart
Do you need the Volatiles on zero headspace leached?
This analysis is done in Sydney and the fastest we can do it is 3 days.

Kind Regards,

Michael Morrison
Analytical Services Manager
Phone: 03 8564 5933
Mobile: 0499 201 025
Email : michaelmorrison@eurofins.com

From: Stuart Carroll <Stuart.Carroll@greencap.com.au>
Sent: Tuesday, 16 June 2020 2:28 PM
To: Michael Morrison <MichaelMorrison@eurofins.com>
Cc: Robin Birua <Robin.Birua@greencap.com.au>
Subject: 724546 & 725276

DRAFT

EXTERNAL EMAIL*

Hi Michael,

Can you please schedule ASLP followed by analysis of suite B1 for the following samples:
- Mn20-Jn14069 – RT541
- Mn20-Jn21228 – RT556
- Mn20-Jn21243 – RT557.

On 24 hour TAT or ASAP please. Thanks a heap

Regards

Stuart Carroll

Senior Consultant - Environment | Greencap

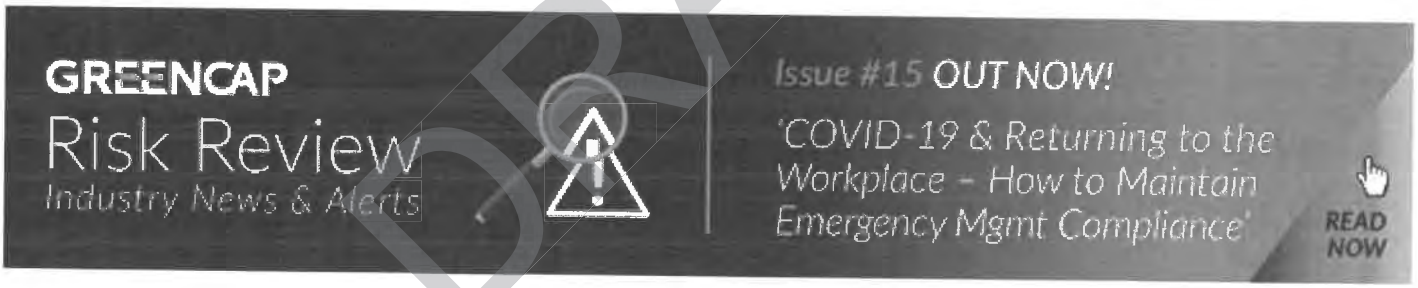
Unit 11 / 14 Winnellie Road Winnellie, NT 0820
D: 08 7906 1312 | M: 0466 776 038 | E: Stuart.Carroll@greencap.com.au | in: LinkedIn

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NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**Greencap NT P/L**
Contact name:	Stuart Carroll
Project name:	One Rail - Diesel Spill Investigation
Project ID:	J168829
COC number:	Not provided
Turn around time:	3 Day
Date/Time received:	Jun 16, 2020 3:22 PM
Eurofins reference:	**725863**

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).

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Contact notes

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

Michael Morrison on Phone : 03 8564 5933 or by e.mail: MichaelMorrison@eurofins.com

Results will be delivered electronically via e.mail to Stuart Carroll - stuart.carroll@greencap.com.au.

Note: A copy of these results will also be delivered to the general Greencap NT P/L email address.

Greencap NT P/L
11/14 Winnellie Road
Winnellie
NT 0800

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Stuart Carroll**

Report **725863-L**
Project name One Rail - Diesel Spill Investigation
Project ID J168829
Received Date Jun 16, 2020

Client Sample ID			**BH15-0.25**	**TP11_0.35**	**TP29_0.35**
Sample Matrix			**AUS Leachate**	**AUS Leachate**	**AUS Leachate**
Eurofins Sample No.			**M20-Jn25576**	**M20-Jn25577**	**M20-Jn25578**
Date Sampled			**Jun 05, 2020**	**Jun 05, 2020**	**Jun 05, 2020**
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	1	mg/L	< 1	< 1	< 1
TRH C10-C14	0.1	mg/L	0.7	0.4	0.7
TRH C15-C28	0.2	mg/L	1.2	0.3	1.6
TRH C29-C36	0.2	mg/L	< 0.2	< 0.2	< 0.2
TRH C10-C36 (Total)	0.5	mg/L	1.9	0.7	2.3
BTEX					
Benzene	0.02	mg/L	< 0.02	< 0.02	< 0.02
Toluene	0.02	mg/L	0.04	< 0.02	< 0.02
Ethylbenzene	0.02	mg/L	< 0.02	< 0.02	< 0.02
m&p-Xylenes	0.02	mg/L	< 0.02	< 0.02	< 0.02
o-Xylene	0.02	mg/L	0.04	< 0.02	< 0.02
Xylenes - Total*	0.06	mg/L	< 0.06	< 0.06	< 0.06
4-Bromofluorobenzene (surr.)	1	%	71	76	68
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.02	mg/L	< 0.1	< 0.1	< 0.1
TRH C6-C10	1	mg/L	< 1	< 1	< 1
TRH C6-C10 less BTEX (F1)[N04]	1	mg/L	< 1	< 1	< 1
TRH >C10-C16	0.05	mg/L	0.77	0.41	1.2
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	0.77	0.41	1.2
TRH >C16-C34	0.1	mg/L	0.8	0.2	1.0
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	1.57	0.61	2.2
AUS Leaching Procedure					
Leachate Fluid[C01]		comment	1.0	1.0	1.0
pH (initial)	0.1	pH Units	5.4	6.1	5.9
pH (Leachate fluid)	0.1	pH Units	5.0	5.0	5.0
pH (off)	0.1	pH Units	5.0	5.0	5.1
AUS Leaching Procedure - ZHE					
Leachate Fluid		comment	4.0	4.0	4.0
pH (AUS ZHE - off)	0.1	pH Units	8.0	8.4	8.8
pH (Leachate Fluid)	0.1	pH Units	6.0	6.0	6.0

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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
Eurofins | mgt Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jun 17, 2020	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Jun 17, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 17, 2020	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 16, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
AUS Leaching Procedure			
pH (initial)	Melbourne	Jun 16, 2020	0 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
pH (Leachate fluid)	Melbourne	Jun 16, 2020	0 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
pH (off)	Melbourne	Jun 16, 2020	0 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			

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Christchurch
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Rolleston, Christchurch 7675
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IANZ # 1290

Company Name: Greencap NT P/L
Address: 11/14 Winnellie Road
Winnellie
NT 0800

Project Name: One Rail - Diesel Spill Investigation
Project ID: J168829

Order No.:
Report #: 725863
Phone: 61 8 8984 4244
Fax: 61 8 8984 3105

Received: Jun 16, 2020 3:22 PM
Due: Jun 19, 2020
Priority: 3 Day
Contact Name: Stuart Carroll

Eurofins Analytical Services Manager : Michael Morrison

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Sample Detail						AUS Leaching Procedure	AUS Leaching Procedure - ZHE	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X
Sydney Laboratory - NATA Site # 18217							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	BH15-0.25	Jun 05, 2020		AUS Leachate	M20-Jn25576	X	X	X
2	TP11_0.35	Jun 05, 2020		AUS Leachate	M20-Jn25577	X	X	X
3	TP29_0.35	Jun 05, 2020		AUS Leachate	M20-Jn25578	X	X	X
Test Counts						3	3	3

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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.

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Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 1			1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.02			0.02	Pass	
Toluene	mg/L	< 0.02			0.02	Pass	
Ethylbenzene	mg/L	< 0.02			0.02	Pass	
m&p-Xylenes	mg/L	< 0.02			0.02	Pass	
o-Xylene	mg/L	< 0.02			0.02	Pass	
Xylenes - Total*	mg/L	< 0.06			0.06	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.02			0.02	Pass	
TRH C6-C10	mg/L	< 1			1	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	120			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	103			70-130	Pass	
Toluene	%	108			70-130	Pass	
Ethylbenzene	%	106			70-130	Pass	
m&p-Xylenes	%	108			70-130	Pass	
o-Xylene	%	106			70-130	Pass	
Xylenes - Total*	%	107			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	92			70-130	Pass	
TRH C6-C10	%	115			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	B20-Jn21379	NCP	mg/L	< 1	< 1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B20-Jn21379	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Toluene	B20-Jn21379	NCP	mg/L	0.03	0.04	6.0	30%	Pass	
Ethylbenzene	B20-Jn21379	NCP	mg/L	0.07	0.07	4.0	30%	Pass	
m&p-Xylenes	B20-Jn21379	NCP	mg/L	0.37	0.38	4.0	30%	Pass	
o-Xylene	B20-Jn21379	NCP	mg/L	0.19	0.19	4.0	30%	Pass	
Xylenes - Total*	B20-Jn21379	NCP	mg/L	0.56	0.58	4.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	B20-Jn21379	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C6-C10	B20-Jn21379	NCP	mg/L	1.8	1.9	6.0	30%	Pass	

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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
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
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.

Authorised By

Michael Morrison	Analytical Services Manager
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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CHAIN OF CUSTODY RECORD

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Unit 2 91 Leach Highway Kewdale WA 6105 08 9251 9600 EnviroSampleWA@eurofins.com
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Greencap NT P/L	Project №	J168829	Project Manager	Stuart Carroll
Address	11/14 Winnellie Road, Winnellie, NT, 0800	Project Name	One Rail - Diesel Spill Investigation	EDD Format (ESdat, EQuIS etc)	
Contact Name	Stuart Carroll				
Phone №	0466 776 038/ 0435 807 659				
Special Directions					
Purchase Order	PO - 275791				
Quote ID №					

Sampler(s)	Staurt Carroll & Robin Birua
Handed over by	N/A
Email for Results	Stuart.Carroll@greencap.com.au & robin.birua@greencap.com.au

Containers (Change container type & size if necessary)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked. ♦Surcharge will apply)

- ☐ Overnight (reporting by 9am)♦
- ☐ Same day♦ ☐ 1 day♦
- ☐ 2 days♦ ☐ 3 days♦
- ☑ 5 days (Standard)
- ☐ Other( )

№	Client Sample ID		Date	Matrix Solid (S) Water (W)	Suite B1	BTEX	500mL Plastic - Unpreserved	500mL Plastic - Sodium Thiosulfate	60mL Plastic - Metals	200mL Amber Glass	40mL VOA Glass Vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	V02-0.3		16/06/20	Soil	1								1		
2	V03-0.3		16/06/20	Soil	1								1		
3	V04-0.3		16/06/20	Soil	1								1		
4	V05-0.3		16/06/20	Soil	1								1		
5	V06-0.5		16/06/20	Soil	1								1		
6	V07-0.6		16/06/20	Soil	1								1		
7	V08-0.4		16/06/20	Soil	1								1		
8	V09-0.4		16/06/20	Soil	1								1		
9	V10-0.4		16/06/20	Soil	1								1		
8	V11-0.3		16/06/20	Soil	1								1		
6	V12-.25		16/06/20	Soil	1								1		
6	V13-0.5		16/06/20	Soil	1								1		
6	V14-0.3		16/06/20	Soil	1								1		
6	V15-0.3		16/06/20	Soil	1								1		
6	V16-0.3		16/06/20	Soil	1								1		
6	V17-0.3		16/06/20	Soil	1								1		
6	V18-0.3		16/06/20	Soil	1								1		
6	V19-0.3		16/06/20	Soil	1								1		
6															
	VQA01		16/06/20	Soil	1								1		
	RB07		16/06/20	Water		1				1					
	TB07		16/06/20	water		1					2				
	Add new rows		Total Counts		19	2				1	2		19		

STANDRAD TAT Please

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Method of Shipment	Courier (#)	Hand Delivered	Postal	Name	Robin Birua	Signature		Date	Time
Eurofins | mgt Laboratory Use Only	Received By	Ashvin Desai	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	adw	Date: 17/06/2020	Time	Temperature	25.3c
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time	Report №	726076

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

#AU09_EnviroSampleDRW

From: Robin Birua <Robin.Birua@greencap.com.au>
Sent: Thursday, 18 June 2020 9:36 AM
To: #AU09_EnviroSampleDRW; Michael Morrison
Cc: Stuart Carroll
Subject: Samples from Yesterday 726076
Attachments: 726076_COC.pdf

Hi Michael,

Would you be able to put on hold for the soil samples we submitted yesterday. We are still waiting for confirmation from our managers to give us a final number on samples and tests requirement.

Sorry for the inconvenience.

Kind regards,

Robin Birua

Consultant Environment | Greencap

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D: 08 7906 1309 | M: 0435 807 659 | E: Robin.Birua@greencap.com.au | in: LinkedIn

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Sample Receipt Advice

Company name:	**Greencap NT P/L**
Contact name:	Stuart Carroll
Project name:	ONE RAIL - DIESEL SPILL INVESTIGATION
Project ID:	J68829
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Jun 17, 2020
Eurofins reference:	**726076**

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

RB07 RECIEVED IN 60ML RED METAL PLASTIC BOTTLE.

Contact notes

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

Michael Morrison on Phone : 03 8564 5933 or by e.mail: MichaelMorrison@eurofins.com

Results will be delivered electronically via e.mail to Stuart Carroll - stuart.carroll@greencap.com.au.

Note: A copy of these results will also be delivered to the general Greencap NT P/L email address.

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Greencap NT P/L
11/14 Winnellie Road
Winnellie
NT 0800

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Stuart Carroll**

Report **726076-S-V2**
Project name ONE RAIL - DIESEL SPILL INVESTIGATION
Project ID J68829
Received Date Jun 17, 2020

Client Sample ID			**V02_0.03**	**V03_0.03**	**V04_0.03**	**V05_0.03**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M20-Jn27268**	**M20-Jn27269**	**M20-Jn27270**	**M20-Jn27271**
Date Sampled			**Jun 16, 2020**	**Jun 16, 2020**	**Jun 16, 2020**	**Jun 16, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 200	< 20	< 200	< 200
TRH C10-C14	20	mg/kg	8100	< 20	3600	2600
TRH C15-C28	50	mg/kg	22000	< 50	7800	7400
TRH C29-C36	50	mg/kg	190	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	30290	< 50	11400	10000
BTEX						
Benzene	0.1	mg/kg	< 1	< 0.1	< 1	< 1
Toluene	0.1	mg/kg	1.3	< 0.1	< 1	< 1
Ethylbenzene	0.1	mg/kg	2.4	< 0.1	1.2	< 1
m&p-Xylenes	0.2	mg/kg	8.5	< 0.2	4.1	< 2
o-Xylene	0.1	mg/kg	5.6	< 0.1	2.6	0.7
Xylenes - Total*	0.3	mg/kg	14	< 0.3	6.7	< 3
4-Bromofluorobenzene (surr.)	1	%	97	101	117	87
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 5	< 0.5	< 5	< 5
TRH C6-C10	20	mg/kg	240	< 20	< 200	< 200
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	220	< 20	< 200	< 200
TRH >C10-C16	50	mg/kg	14000	< 50	5500	4500
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	14000	< 50	5500	4500
TRH >C16-C34	100	mg/kg	15000	< 100	5200	5100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	29000	< 100	10700	9600
% Moisture	1	%	6.5	5.0	6.4	7.5

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Client Sample ID			V06_0.05	V07_0.06	V08_0.04	V09_0.04
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn27272	M20-Jn27273	M20-Jn27274	M20-Jn27275
Date Sampled			Jun 16, 2020	Jun 16, 2020	Jun 16, 2020	Jun 16, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 200	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	2900	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	11000	< 50	97	90
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	13900	< 50	97	90
BTEX						
Benzene	0.1	mg/kg	< 1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.4	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	84	82	78	80
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 200	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 200	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	5600	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	5600	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	7700	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	13300	< 100	< 100	< 100
% Moisture	1	%	6.6	6.3	5.1	4.5

Client Sample ID			V10_0.04	V11_0.03	V12_0.025	V13_0.05
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn27276	M20-Jn27277	M20-Jn27278	M20-Jn27279
Date Sampled			Jun 16, 2020	Jun 16, 2020	Jun 16, 2020	Jun 16, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 200	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	12000	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	29000	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	69	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	41069	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	1.3	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	4.4	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	3.2	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	7.6	< 0.3
4-Bromofluorobenzene (surr.)	1	%	78	86	90	81

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Client Sample ID			V10_0.04	V11_0.03	V12_0.025	V13_0.05
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn27276	M20-Jn27277	M20-Jn27278	M20-Jn27279
Date Sampled			Jun 16, 2020	Jun 16, 2020	Jun 16, 2020	Jun 16, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 200	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 200	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	20000	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	20000	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	19000	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	39000	< 100
% Moisture	1	%	4.0	4.3	3.5	9.1

Client Sample ID			V14_0.03	V15_0.03	V16_0.03	V17_0.03
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn27280	M20-Jn27281	M20-Jn27282	M20-Jn27283
Date Sampled			Jun 16, 2020	Jun 16, 2020	Jun 16, 2020	Jun 16, 2020
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	160	98	61	99
TRH C15-C28	50	mg/kg	2100	1700	2100	1100
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	2260	1798	2161	1199
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	%	83	77	82	121
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	480	330	320	300
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	480	330	320	300
TRH >C16-C34	100	mg/kg	1700	1400	1800	840
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	2180	1730	2120	1140
% Moisture	1	%	2.3	1.7	1.6	< 1

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Client Sample ID			V18_0.03	V19_0.03	VQA01
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			M20-Jn27284	M20-Jn27285	M20-Jn27286
Date Sampled			Jun 16, 2020	Jun 16, 2020	Jun 16, 2020
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 200	< 200	< 200
TRH C10-C14	20	mg/kg	12000	1300	15000
TRH C15-C28	50	mg/kg	53000	10000	64000
TRH C29-C36	50	mg/kg	420	150	230
TRH C10-C36 (Total)	50	mg/kg	65420	11450	79230
BTEX					
Benzene	0.1	mg/kg	< 1	< 1	< 1
Toluene	0.1	mg/kg	< 1	< 1	< 1
Ethylbenzene	0.1	mg/kg	< 1	< 1	< 1
m&p-Xylenes	0.2	mg/kg	2.3	< 2	3.1
o-Xylene	0.1	mg/kg	1.9	< 1	2.6
Xylenes - Total*	0.3	mg/kg	4.2	< 3	5.7
4-Bromofluorobenzene (surr.)	1	%	146	80	101
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	< 5	< 5	< 5
TRH C6-C10	20	mg/kg	< 200	< 200	< 200
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 200	< 200	< 200
TRH >C10-C16	50	mg/kg	25000	3500	32000
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	25000	3500	32000
TRH >C16-C34	100	mg/kg	38000	7700	44000
TRH >C34-C40	100	mg/kg	170	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	63170	11200	76000
% Moisture	1	%	2.8	1.7	2.9

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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
Eurofins | mgt Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jun 25, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Jun 25, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 25, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 25, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
% Moisture	Melbourne	Jun 25, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

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Company Name: Greencap NT P/L
Address: 11/14 Winnellie Road
Winnellie
NT 0800

Project Name: ONE RAIL - DIESEL SPILL INVESTIGATION
Project ID: J68829

Order No.: PO-275791
Report #: 726076
Phone: 61 8 8984 4244
Fax: 61 8 8984 3105

Received: Jun 25, 2020 12:10 PM
Due: Jun 29, 2020
Priority: 2 Day
Contact Name: Stuart Carroll

Eurofins Analytical Services Manager : Michael Morrison

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Sample Detail						HOLD	BTEX	Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	V02_0.03	Jun 16, 2020		Soil	M20-Jn27268			X	X
2	V03_0.03	Jun 16, 2020		Soil	M20-Jn27269			X	X
3	V04_0.03	Jun 16, 2020		Soil	M20-Jn27270			X	X
4	V05_0.03	Jun 16, 2020		Soil	M20-Jn27271			X	X
5	V06_0.05	Jun 16, 2020		Soil	M20-Jn27272			X	X
6	V07_0.06	Jun 16, 2020		Soil	M20-Jn27273			X	X
7	V08_0.04	Jun 16, 2020		Soil	M20-Jn27274			X	X
8	V09_0.04	Jun 16, 2020		Soil	M20-Jn27275			X	X
9	V10_0.04	Jun 16, 2020		Soil	M20-Jn27276			X	X
10	V11_0.03	Jun 16, 2020		Soil	M20-Jn27277			X	X

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Company Name: Greencap NT P/L
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Eurofins Analytical Services Manager : Michael Morrison

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Sample Detail						HOLD	BTEX	Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
11	V12_0.025	Jun 16, 2020		Soil	M20-Jn27278			X	X
12	V13_0.05	Jun 16, 2020		Soil	M20-Jn27279			X	X
13	V14_0.03	Jun 16, 2020		Soil	M20-Jn27280			X	X
14	V15_0.03	Jun 16, 2020		Soil	M20-Jn27281			X	X
15	V16_0.03	Jun 16, 2020		Soil	M20-Jn27282			X	X
16	V17_0.03	Jun 16, 2020		Soil	M20-Jn27283			X	X
17	V18_0.03	Jun 16, 2020		Soil	M20-Jn27284			X	X
18	V19_0.03	Jun 16, 2020		Soil	M20-Jn27285			X	X
19	VQA01	Jun 16, 2020		Soil	M20-Jn27286			X	X
20	RB07	Jun 16, 2020		Water	M20-Jn27287	X			
21	TB07	Jun 16, 2020		Water	M20-Jn27288		X		
Test Counts						1	1	19	19

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.

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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	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	101			70-130	Pass	
TRH C10-C14	%	105			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	88			70-130	Pass	
Toluene	%	113			70-130	Pass	
Ethylbenzene	%	115			70-130	Pass	
m&p-Xylenes	%	107			70-130	Pass	
Xylenes - Total*	%	111			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	125			70-130	Pass	
TRH C6-C10	%	82			70-130	Pass	
TRH >C10-C16	%	100			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	M20-Jn27269	CP	%	97			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M20-Jn27269	CP	%	91			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M20-Jn27279	CP	%	114			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M20-Jn27279	CP	%	108			70-130	Pass	
Spike - % Recovery									

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Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M20-Jn27281	CP	%	74			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M20-Jn27281	CP	%	77			70-130	Pass	
Toluene	M20-Jn27281	CP	%	81			70-130	Pass	
Ethylbenzene	M20-Jn27281	CP	%	86			70-130	Pass	
m&p-Xylenes	M20-Jn27281	CP	%	81			70-130	Pass	
o-Xylene	M20-Jn27281	CP	%	86			70-130	Pass	
Xylenes - Total*	M20-Jn27281	CP	%	83			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M20-Jn27281	CP	%	92			70-130	Pass	
TRH C6-C10	M20-Jn27281	CP	%	73			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M20-Jn45577	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M20-Jn45577	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M20-Jn45577	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M20-Jn45577	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M20-Jn45577	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M20-Jn45577	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M20-Jn27268	CP	%	6.5	6.4	2.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M20-Jn27277	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M20-Jn27277	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M20-Jn27277	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M20-Jn27277	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M20-Jn27277	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M20-Jn27277	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	M20-Jn27277	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M20-Jn27277	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M20-Jn27277	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M20-Jn27278	CP	%	3.5	4.7	28	30%	Pass	

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Comments

V2: This report has been amended with updated sample Id's (as in appended COC) as requested by SC 29/6/20

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.

Authorised By

Michael Morrison	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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.

DRAFT

Greencap NT P/L
11/14 Winnellie Road
Winnellie
NT 0800

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Stuart Carroll**

Report **726076-W-V2**
Project name ONE RAIL - DIESEL SPILL INVESTIGATION
Project ID J68829
Received Date Jun 17, 2020

Client Sample ID			**TB07**
Sample Matrix			**Water**
Eurofins Sample No.			**M20-Jn27288**
Date Sampled			**Jun 16, 2020**
Test/Reference	LOR	Unit	
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	105

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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
Eurofins | mgt Suite B1			
BTEX	Melbourne	Jun 25, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			

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eurofins | Environment Testing

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Australia

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6 Monterey Road
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NATA # 1261
Site # 1254 & 14271

Sydney
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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

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name:	Greencap NT P/L	**Order No.:**	PO-275791
Address:	11/14 Winnellie Road Winnellie NT 0800	**Report #:**	726076
		Phone:	61 8 8984 4244
		Fax:	61 8 8984 3105
Project Name:	ONE RAIL - DIESEL SPILL INVESTIGATION		
Project ID:	J68829		

Received:	Jun 25, 2020 12:10 PM	
Due:	Jun 29, 2020	
Priority:	2 Day	
Contact Name:	Stuart Carroll	

Eurofins Analytical Services Manager : Michael Morrison

Sample Detail						HOLD	BTEX	Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	V02_0.03	Jun 16, 2020		Soil	M20-Jn27268			X	X
2	V03_0.03	Jun 16, 2020		Soil	M20-Jn27269			X	X
3	V04_0.03	Jun 16, 2020		Soil	M20-Jn27270			X	X
4	V05_0.03	Jun 16, 2020		Soil	M20-Jn27271			X	X
5	V06_0.05	Jun 16, 2020		Soil	M20-Jn27272			X	X
6	V07_0.06	Jun 16, 2020		Soil	M20-Jn27273			X	X
7	V08_0.04	Jun 16, 2020		Soil	M20-Jn27274			X	X
8	V09_0.04	Jun 16, 2020		Soil	M20-Jn27275			X	X
9	V10_0.04	Jun 16, 2020		Soil	M20-Jn27276			X	X
10	V11_0.03	Jun 16, 2020		Soil	M20-Jn27277			X	X

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Eurofins Analytical Services Manager : Michael Morrison

DRAFT

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Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
11	V12_0.025	Jun 16, 2020		Soil	M20-Jn27278			X	X
12	V13_0.05	Jun 16, 2020		Soil	M20-Jn27279			X	X
13	V14_0.03	Jun 16, 2020		Soil	M20-Jn27280			X	X
14	V15_0.03	Jun 16, 2020		Soil	M20-Jn27281			X	X
15	V16_0.03	Jun 16, 2020		Soil	M20-Jn27282			X	X
16	V17_0.03	Jun 16, 2020		Soil	M20-Jn27283			X	X
17	V18_0.03	Jun 16, 2020		Soil	M20-Jn27284			X	X
18	V19_0.03	Jun 16, 2020		Soil	M20-Jn27285			X	X
19	VQA01	Jun 16, 2020		Soil	M20-Jn27286			X	X
20	RB07	Jun 16, 2020		Water	M20-Jn27287	X			
21	TB07	Jun 16, 2020		Water	M20-Jn27288		X		
Test Counts						1	1	19	19

eurofins | Environment Testing

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
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TEQ	Toxic Equivalency Quotient

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

Results <10 times the LOR : No Limit

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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.

DRAFT

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	101			70-130	Pass	
Toluene	%	100			70-130	Pass	
Ethylbenzene	%	95			70-130	Pass	
m&p-Xylenes	%	95			70-130	Pass	
Xylenes - Total*	%	95			70-130	Pass	

DRAFT

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

Authorised By

Michael Morrison	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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.

DRAFT

#AU_CAU001_EnviroSampleVic

From: Michael Morrison
Sent: Friday, 19 June 2020 10:43 AM
To: #AU_CAU001_EnviroSampleVic
Cc: Catherine Wilson
Subject: FW: [EXT]:RE: 725276

Hi Adlin
Please book this same day in for B1 and BTEX for the samples mentioned below.
Don't worry about the photos I sent them yesterday.

Kind Regards,

Michael Morrison
Analytical Services Manager
Phone: 03 8564 5933
Mobile: 0499 201 025
Email : michaelmorrison@eurofins.com

From: Stuart Carroll <Stuart.Carroll@greencap.com.au>
Sent: Friday, 19 June 2020 10:34 AM
To: Michael Morrison <MichaelMorrison@eurofins.com>
Cc: Robin Birua <Robin.Birua@greencap.com.au>
Subject: RE: [EXT]:RE: 725276

EXTERNAL EMAIL*

Hi Michael,

Sorry to be pushy, can you please ask Sample Receipt to take the photos ASAP. There are a number of additional samples in this batch which we may need to request analysis of e.g. TP14 & TP17.

Also, can you please undertake analysis of the following samples from batch 724546:

- BH17_0.65 (M20-Jn14203) HT0068
- BH17_2.4 (Mn-Jn14206)
- BH17_3.4 (Mn-Jn14207)

Please put on same day TAT if possible as the holding time is due to expire today. Let me know if there are any issues.

Much appreciated.

726580
19/6 1043

Stuart Carroll

Senior Consultant - Environment | Greencap

Unit 11 / 14 Winnellie Road Winnellie, NT 0820
D: 08 7906 1312 | M: 0466 776 038 | E: Stuart.Carroll@greencap.com.au | in: LinkedIn

DRAFT

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NATA # 1261
Site # 1254 & 14271

Sydney
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Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

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

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

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**Greencap NT P/L**
Contact name:	Stuart Carroll
Project name:	One Rail - Diesel Spill Investigation
Project ID:	J168829
COC number:	Not provided
Turn around time:	Same day
Date/Time received:	Jun 19, 2020 10:43 AM
Eurofins reference:	**726580**

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).

DRAFT

Contact notes

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

Michael Morrison on Phone : 03 8564 5933 or by e.mail: MichaelMorrison@eurofins.com

Results will be delivered electronically via e.mail to Stuart Carroll - stuart.carroll@greencap.com.au.

Note: A copy of these results will also be delivered to the general Greencap NT P/L email address.

Greencap NT P/L
11/14 Winnellie Road
Winnellie
NT 0800

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Stuart Carroll**

Report **726580-S**
Project name One Rail - Diesel Spill Investigation
Project ID J168829
Received Date Jun 19, 2020

Client Sample ID			**BH17_0.65**	**BH17_2.4**	**BH17_3.4**
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M20-Jn32160**	**M20-Jn32161**	**M20-Jn32162**
Date Sampled			**Jun 03, 2020**	**Jun 03, 2020**	**Jun 03, 2020**
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	55	77	< 20
TRH C15-C28	50	mg/kg	160	220	100
TRH C29-C36	50	mg/kg	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	215	297	100
BTEX					
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	92	115	116
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	95	140	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	95	140	< 50
TRH >C16-C34	100	mg/kg	120	160	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	215	300	< 100
% Moisture	1	%	10	9.2	13

DRAFT

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
Eurofins | mgt Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jun 19, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Jun 19, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 19, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 19, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
% Moisture	Melbourne	Jun 19, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

DRAFT

eurofins | Environment Testing

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NATA # 1261 Site # 18217

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NATA # 1261 Site # 20794

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IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Greencap NT P/L
Address: 11/14 Winnellie Road
Winnellie
NT 0800

Project Name: One Rail - Diesel Spill Investigation
Project ID: J168829

Order No.:
Report #: 726580
Phone: 61 8 8984 4244
Fax: 61 8 8984 3105

Received: Jun 19, 2020 10:43 AM
Due: Jun 19, 2020
Priority: Same day
Contact Name: Stuart Carroll

Eurofins Analytical Services Manager : Michael Morrison

Sample Detail						Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	BH17_0.65	Jun 03, 2020		Soil	M20-Jn32160	X	X
2	BH17_2.4	Jun 03, 2020		Soil	M20-Jn32161	X	X
3	BH17_3.4	Jun 03, 2020		Soil	M20-Jn32162	X	X
Test Counts						3	3

DRAFT

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.

DRAFT

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	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	105			70-130	Pass	
TRH C10-C14	%	105			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	107			70-130	Pass	
Toluene	%	101			70-130	Pass	
Ethylbenzene	%	101			70-130	Pass	
m&p-Xylenes	%	96			70-130	Pass	
Xylenes - Total*	%	96			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	111			70-130	Pass	
TRH C6-C10	%	101			70-130	Pass	
TRH >C10-C16	%	75			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 C6-C9	M20-Jn32160	CP	%	127			70-130	Pass	
TRH C10-C14	M20-Jn29670	NCP	%	111			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M20-Jn32160	CP	%	104			70-130	Pass	
Toluene	M20-Jn32160	CP	%	95			70-130	Pass	
Ethylbenzene	M20-Jn32160	CP	%	98			70-130	Pass	
m&p-Xylenes	M20-Jn32160	CP	%	93			70-130	Pass	
o-Xylene	M20-Jn32160	CP	%	94			70-130	Pass	
Xylenes - Total*	M20-Jn32160	CP	%	93			70-130	Pass	
Spike - % Recovery									

DRAFT

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M20-Jn32160	CP	%	75			70-130	Pass	
TRH C6-C10	M20-Jn32160	CP	%	120			70-130	Pass	
TRH >C10-C16	M20-Jn29670	NCP	%	107			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M20-Jn30850	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M20-Jn27957	NCP	mg/kg	22	24	8.0	30%	Pass	
TRH C15-C28	M20-Jn27957	NCP	mg/kg	180	230	23	30%	Pass	
TRH C29-C36	M20-Jn27957	NCP	mg/kg	98	110	10	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M20-Jn30850	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M20-Jn30850	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M20-Jn30850	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M20-Jn30850	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M20-Jn30850	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	M20-Jn30850	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M20-Jn30850	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M20-Jn30850	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M20-Jn27957	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M20-Jn27957	NCP	mg/kg	240	290	19	30%	Pass	
TRH >C34-C40	M20-Jn27957	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M20-Jn31922	NCP	%	25	24	3.0	30%	Pass	

DRAFT

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
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.

Authorised By

Michael Morrison	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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DRAFT

#AU_CAU001_EnviroSampleVic

From: Michael Morrison
Sent: Friday, 19 June 2020 11:34 AM
To: #AU_CAU001_EnviroSampleVic
Cc: Catherine Wilson
Subject: FW: [EXT]:RE: 725276

Hi Adlin
Please book this same day in as per below

Kind Regards,

Michael Morrison
Analytical Services Manager
Phone: 03 8564 5933
Mobile: 0499 201 025
Email : michaelmorrison@eurofins.com

From: Stuart Carroll <Stuart.Carroll@greencap.com.au>
Sent: Friday, 19 June 2020 11:31 AM
To: Michael Morrison <MichaelMorrison@eurofins.com>
Cc: Robin Birua <Robin.Birua@greencap.com.au>
Subject: RE: [EXT]:RE: 725276

EXTERNAL EMAIL*

725613
19/6 11:34a

Thanks mate,

Can you please schedule analysis of suite B1 (same day TAT if possible) in the following:

- *TP14_0.0* (M20-Jn21271) - HT101
- *TP14_0.4* (M20-Jn21273)
- *TP17_0.15* (M20-Jn21279)

And report the sample IDs as per the italics above.

Much appreciated.

Stuart Carroll

Senior Consultant - Environment | Greencap

Unit 11 / 14 Winnellie Road Winnellie, NT 0820
D: 08 7906 1312 | M: 0466 776 038 | E: Stuart.Carroll@greencap.com.au | in: LinkedIn

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NATA # 1261 Site # 18217

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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

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

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**Greencap NT P/L**
Contact name:	Stuart Carroll
Project name:	One Rail - Diesel Spill Investigation
Project ID:	J168829
COC number:	Not provided
Turn around time:	Same day
Date/Time received:	Jun 19, 2020 11:34 AM
Eurofins reference:	**726613**

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).

DRAFT

Contact notes

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

Michael Morrison on Phone : 03 8564 5933 or by e.mail: MichaelMorrison@eurofins.com

Results will be delivered electronically via e.mail to Stuart Carroll - stuart.carroll@greencap.com.au.

Note: A copy of these results will also be delivered to the general Greencap NT P/L email address.

Greencap NT P/L
11/14 Winnellie Road
Winnellie
NT 0800

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Stuart Carroll**

Report **726613-S**
Project name One Rail - Diesel Spill Investigation
Project ID J168829
Received Date Jun 19, 2020

Client Sample ID			**TP14_0.0**	**TP14_0.4**	**TP17_0.15**
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M20-Jn32503**	**M20-Jn32504**	**M20-Jn32505**
Date Sampled			**Jun 10, 2020**	**Jun 10, 2020**	**Jun 10, 2020**
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	480
TRH C29-C36	50	mg/kg	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	480
BTEX					
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	145	105	96
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	120
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	120
TRH >C16-C34	100	mg/kg	< 100	< 100	370
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	490
% Moisture	1	%	1.5	10	8.8

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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
Eurofins | mgt Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jun 19, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Jun 19, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 19, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 19, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
% Moisture	Melbourne	Jun 19, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

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eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
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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

New Zealand

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Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Greencap NT P/L
Address: 11/14 Winnellie Road
Winnellie
NT 0800

Project Name: One Rail - Diesel Spill Investigation
Project ID: J168829

Order No.:
Report #: 726613
Phone: 61 8 8984 4244
Fax: 61 8 8984 3105

Received: Jun 19, 2020 11:34 AM
Due: Jun 19, 2020
Priority: Same day
Contact Name: Stuart Carroll

Eurofins Analytical Services Manager : Michael Morrison

Sample Detail						Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	TP14_0.0	Jun 10, 2020		Soil	M20-Jn32503	X	X
2	TP14_0.4	Jun 10, 2020		Soil	M20-Jn32504	X	X
3	TP17_0.15	Jun 10, 2020		Soil	M20-Jn32505	X	X
Test Counts						3	3

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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.

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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	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	122			70-130	Pass	
TRH C10-C14	%	81			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	124			70-130	Pass	
Toluene	%	121			70-130	Pass	
Ethylbenzene	%	124			70-130	Pass	
m&p-Xylenes	%	121			70-130	Pass	
Xylenes - Total*	%	122			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	115			70-130	Pass	
TRH C6-C10	%	116			70-130	Pass	
TRH >C10-C16	%	79			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 C6-C9	M20-Jn29670	NCP	%	112			70-130	Pass	
TRH C10-C14	M20-Jn27949	NCP	%	87			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M20-Jn29670	NCP	%	116			70-130	Pass	
Toluene	M20-Jn29670	NCP	%	113			70-130	Pass	
Ethylbenzene	M20-Jn29670	NCP	%	115			70-130	Pass	
m&p-Xylenes	M20-Jn29670	NCP	%	109			70-130	Pass	
o-Xylene	M20-Jn29670	NCP	%	111			70-130	Pass	
Xylenes - Total*	M20-Jn29670	NCP	%	110			70-130	Pass	
Spike - % Recovery									

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Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M20-Jn29670	NCP	%	104			70-130	Pass	
TRH C6-C10	M20-Jn29670	NCP	%	106			70-130	Pass	
TRH >C10-C16	M20-Jn27949	NCP	%	85			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M20-Jn31922	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M20-Jn31923	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M20-Jn31923	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M20-Jn31923	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M20-Jn31922	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M20-Jn31922	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M20-Jn31922	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M20-Jn31922	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M20-Jn31922	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	M20-Jn31922	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M20-Jn31922	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M20-Jn31922	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M20-Jn31923	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M20-Jn31923	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M20-Jn31923	NCP	mg/kg	< 100	< 100	<1	30%	Pass	

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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
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.

Authorised By

Michael Morrison	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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CHAIN OF CUSTODY RECORD

Eurofins | mgt 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 Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
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08 9251 9600 EnviroSampleWA@eurofins.com

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

Company	Greencap NT P/L
Address	11/14 Winnellie Road, Winnellie, NT, 0800
Contact Name	Stuart Carroll
Phone №	0466 776 038/ 0435 807 659
Special Directions	
Purchase Order	PO - 275974
Quote ID №	
Project №	J168829
Project Name	One Rail - Diesel Spill Investigation
Project Manager	Stuart Carroll
EDD Format (Excel, EQuIS etc)	
Sampler(s)	Robin Birua
Handed over by	N/A
Email for Results	Stuart.Carroll@greencap.com.au & robin.birua@greencap.com.au

Containers (Change container type & size if necessary)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked)

♦Surcharge will apply
- ☐ Overnight (reporting by 9am)♦
- ☐ Same day ♦ ☐ 1 day ♦
- ☐ 2 days ♦ ☐ 3 days ♦
- ☑ 5 days (Standard)
- ☐ Other( )

№	Client Sample ID	Sampling Date	Matrix Soil (S) Water (W)	Suite B1	BTEX	500mL Plastic - Unpreserved	500mL Plastic - Sodium Thiosulfate	60mL Plastic - Metals	200mL Amber Glass	40mL VOA Glass Vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	SP-01	18/06/20	Soil	1								1		
2	SP-02	18/06/20	Soil	1								1		
3	SP-03	18/06/20	Soil	1								1		
4	SP-04	18/06/20	Soil	1								1		
5	SP-05	18/06/20	Soil	1								1		
6	SP-06	18/06/20	Soil	1								1		
7	SP-07	18/06/20	Soil	1								1		
8	SP-08	18/06/20	Soil	1								1		
9	SP-09	18/06/20	Soil	1								1		
6	SP-10	18/06/20	Soil	1								1		
6	SP-11	18/06/20	Soil	1								1		
6	SP-12	18/06/20	Soil	1								1		
6														
6	SPQA01	18/06/20	Soil	1										
6	TPQA01	19/06/20	Soil	1								1		
6	TP30-0.0	19/06/20	Soil	1								1		
6	TP30-0.6	19/06/20	Soil	1								1		
6	TP31-0.0	19/06/20	Soil	1								1		
6	TP32-0.0	19/06/20	Soil	1								1		
	TP32-0.15	19/06/20	Soil	1								1		
	TP32- 0.40	19/06/20	Soil	1								1		
	RB08	18/06/20	Water		1							1		
	TB08	18/06/20	water		1			1						
									2					
	Add new rows		Total Counts	20	2			1	2			20		

STANDRAD TAT Please

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Method of Shipment	Courier (#)	Hand Delivered	Postal	Name	Robin Birua	Signature	Date	Time
Eurofins | mgt Laboratory Use Only	Received By Ashvin Desai	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date: 23/06/2020	Time	2:35PM	Temperature 17.0C
	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time		Report № 727284

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

#AU_CAU001_EnviroSampleVic

From: Michael Morrison
Sent: Tuesday, 23 June 2020 6:35 PM
To: #AU_CAU001_EnviroSampleVic; #AU09_EnviroSampleDRW
Subject: FW: [EXT]:Eurofins Sample Receipt Advice - Report 727254 : Site ONE RAIL - DIESEL SPILL INVESTIGATION (J168829)
Attachments: J168829_MGT_230620.xlsm

Hi Cahn
I think we have these samples now

Kind Regards,

Michael Morrison
Analytical Services Manager
Phone: 03 8564 5933
Mobile: 0499 201 025
Email : michaelmorrison@eurofins.com

From: Stuart Carroll <Stuart.Carroll@greencap.com.au>
Sent: Tuesday, 23 June 2020 6:05 PM
To: #AU09_EnviroSampleDRW <EnviroSampleDRW@eurofins.com>; Michael Morrison <MichaelMorrison@eurofins.com>
Cc: Robin Birua <Robin.Birua@greencap.com.au>
Subject: RE: [EXT]:Eurofins Sample Receipt Advice - Report 727254 : Site ONE RAIL - DIESEL SPILL INVESTIGATION (J168829)

EXTERNAL EMAIL*

Thanks Ashvin.

Can you please process this batch as per the updated COC attached. Much appreciated.

Stuart Carroll

Senior Consultant - Environment | Greencap

Unit 11 / 14 Winnellie Road Winnellie, NT 0820
D: 08 7906 1312 | M: 0466 776 038 | E: Stuart.Carroll@greencap.com.au | in: LinkedIn

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CHAIN OF CUSTODY RECORD

Eurofins | mgt 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 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** 6 Monterey Road Dandenong South VIC 3175 03 8564 5000 EnviroSampleVic@eurofins.com

Company	Greencap NT P/L	Project №	J168829	Project Manager	Stuart Carroll
Address	11/14 Winnellie Road, Winnellie, NT, 0800	Project Name	One Rail - Diesel Spill Investigation	EDD Format (ESdat, EQuIS etc)	
Contact Name	Stuart Carroll				
Phone №	0466 776 038/ 0435 807 659				
Special Directions					
Purchase Order	PO - 275974				
Quote ID №					

Sampler(s)	Robin Birua
Handed over by	N/A
Email for Results	Stuart.Carroll@greencap.com.au & robin.birua@greencap.com.au

Containers (Change container type & size if necessary.)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked)

♦Surcharge will apply

☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☑ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampling Date	Matrix Solid (S) Water (W)	Suite B1	BTEX	500mL Plastic - Unpreserved	500mL Plastic - Sodium Thiosulfate	60mL Plastic - Metals	200mL Amber Glass	40mL VOA Glass Vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	SP-01	18/06/20	Soil	1								1		
2	SP-02	18/06/20	Soil	1								1		
3	SP-03	18/06/20	Soil	1								1		
4	SP-04	18/06/20	Soil	1								1		
5	SP-05	18/06/20	Soil	1								1		
6	SP-06	18/06/20	Soil	1								1		
7	SP-07	18/06/20	Soil	1								1		
8	SP-08	18/06/20	Soil	1								1		
9	SP-09	18/06/20	Soil	1								1		
6	SP-10	18/06/20	Soil	1								1		
6	SP-11	18/06/20	Soil									1		
6	SP-12	18/06/20	Soil									1		
6														
6	SPQA01	18/06/20	Soil									1		
6	TPQA01	19/06/20	Soil									1		
6	TP30-0.0	19/06/20	Soil									1		
6	TP30-0.6	19/06/20	Soil	1								1		
6	TP31-0.0	19/06/20	Soil	1								1		
6	TP32-0.0	19/06/20	Soil									1		
	TP32-0.15	19/06/20	Soil									1		
	TP32- 0.40	19/06/20	Soil									1		
	RB08	18/06/20	Water		1				1					
	TB08	18/06/20	water		1					2				
	Add new rows		Total Counts	12	2				1	2		20		

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48 Hour TAT Please

Method of Shipment	Courier (#)	Hand Delivered	Postal	Name	Robin Birua	Signature		Date	Time
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date: 23/06/2020	Time	Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time	Report №	

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

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

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ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**Greencap NT P/L**
Contact name:	Stuart Carroll
Project name:	ONE RAIL - DIESEL SPILL INVESTIGATION
Project ID:	J168829
COC number:	Not provided
Turn around time:	2 Day
Date/Time received:	Jun 23, 2020 2:35 PM
Eurofins reference:	**727254**

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).

Contact notes

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

Michael Morrison on Phone : 03 8564 5933 or by e.mail: MichaelMorrison@eurofins.com

Results will be delivered electronically via e.mail to Stuart Carroll - stuart.carroll@greencap.com.au.

Note: A copy of these results will also be delivered to the general Greencap NT P/L email address.

DRAFT

Greencap NT P/L
11/14 Winnellie Road
Winnellie
NT 0800

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Stuart Carroll**

Report **727254-S**
Project name ONE RAIL - DIESEL SPILL INVESTIGATION
Project ID J168829
Received Date Jun 23, 2020

Client Sample ID			**SP-01**	**SP-02**	**SP-04**	**SP-05**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M20-Jn38555**	**M20-Jn38556**	**M20-Jn38558**	**M20-Jn38559**
Date Sampled			**Jun 18, 2020**	**Jun 18, 2020**	**Jun 18, 2020**	**Jun 18, 2020**
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	33	490	2100	1800
TRH C15-C28	50	mg/kg	330	3800	7000	7400
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	363	4290	9100	9200
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	0.4	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	0.4	< 0.1	0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	0.9	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	71	88	136	75
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	34	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	33	< 20	< 20
TRH >C10-C16	50	mg/kg	91	1400	4200	4000
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	91	1400	4200	4000
TRH >C16-C34	100	mg/kg	240	2700	4700	5000
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	331	4100	8900	9000
% Moisture	1	%	3.8	3.8	3.9	3.5

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Client Sample ID			SP-06	SP-07	SP-08	SP-09
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn38560	M20-Jn38561	M20-Jn38562	M20-Jn38563
Date Sampled			Jun 18, 2020	Jun 18, 2020	Jun 18, 2020	Jun 18, 2020
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	1200	1100	1100	2400
TRH C15-C28	50	mg/kg	5000	4200	4500	8200
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	6200	5300	5600	10600
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	0.3
o-Xylene	0.1	mg/kg	< 0.1	0.1	< 0.1	0.3
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	0.6
4-Bromofluorobenzene (surr.)	1	%	82	82	119	146
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	22
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	21
TRH >C10-C16	50	mg/kg	2600	2300	2400	4900
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	2600	2300	2400	4900
TRH >C16-C34	100	mg/kg	3400	2900	3100	5600
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	6000	5200	5500	10500
% Moisture	1	%	4.9	4.9	5.9	5.3

Client Sample ID			SP-10	SP-11	SP-12	TP30-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn38564	M20-Jn38565	M20-Jn38566	M20-Jn38570
Date Sampled			Jun 18, 2020	Jun 18, 2020	Jun 18, 2020	Jun 19, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	24	< 20
TRH C10-C14	20	mg/kg	1700	2900	7100	< 20
TRH C15-C28	50	mg/kg	6400	9600	21000	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	8100	12500	28100	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	0.3	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	0.5	< 0.1
m&p-Xylenes	0.2	mg/kg	0.3	< 0.2	3.1	< 0.2
o-Xylene	0.1	mg/kg	0.3	0.2	2.4	< 0.1
Xylenes - Total*	0.3	mg/kg	0.6	0.4	5.4	< 0.3
4-Bromofluorobenzene (surr.)	1	%	92	140	123	65

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Client Sample ID			SP-10	SP-11	SP-12	TP30-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Jn38564	M20-Jn38565	M20-Jn38566	M20-Jn38570
Date Sampled			Jun 18, 2020	Jun 18, 2020	Jun 18, 2020	Jun 19, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	0.7	0.8	< 0.5
TRH C6-C10	20	mg/kg	25	< 20	87	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	24	< 20	81	< 20
TRH >C10-C16	50	mg/kg	3600	5800	14000	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	3600	5799.3	13999.2	< 50
TRH >C16-C34	100	mg/kg	4400	6500	14000	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	8000	12300	28000	< 100
% Moisture	1	%	5.9	5.5	4.1	12

Client Sample ID			TP31-0.0
Sample Matrix			Soil
Eurofins Sample No.			M20-Jn38571
Date Sampled			Jun 19, 2020
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	840
TRH C29-C36	50	mg/kg	< 50
TRH C10-C36 (Total)	50	mg/kg	840
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	68
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	720
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	720
% Moisture	1	%	< 1

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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
Eurofins | mgt Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jun 24, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Jun 24, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 24, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 24, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
% Moisture	Melbourne	Jun 23, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

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NATA # 1261 Site # 18217

Brisbane
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NATA # 1261 Site # 20794

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IANZ # 1290

Company Name:	Greencap NT P/L	**Order No.:**	PO-275974
Address:	11/14 Winnellie Road Winnellie NT 0800	**Report #:**	727254
		Phone:	61 8 8984 4244
		Fax:	61 8 8984 3105
Project Name:	ONE RAIL - DIESEL SPILL INVESTIGATION		
Project ID:	J168829		

Received: Jun 23, 2020 2:35 PM
Due: Jun 25, 2020
Priority: 2 Day
Contact Name: Stuart Carroll

Eurofins Analytical Services Manager : Michael Morrison

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Sample Detail						HOLD	BTEX	Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	SP-01	Jun 18, 2020		Soil	M20-Jn38555			X	X
2	SP-02	Jun 18, 2020		Soil	M20-Jn38556			X	X
3	SP-03	Jun 18, 2020		Soil	M20-Jn38557			X	X
4	SP-04	Jun 18, 2020		Soil	M20-Jn38558			X	X
5	SP-05	Jun 18, 2020		Soil	M20-Jn38559			X	X
6	SP-06	Jun 18, 2020		Soil	M20-Jn38560			X	X
7	SP-07	Jun 18, 2020		Soil	M20-Jn38561			X	X
8	SP-08	Jun 18, 2020		Soil	M20-Jn38562			X	X
9	SP-09	Jun 18, 2020		Soil	M20-Jn38563			X	X
10	SP-10	Jun 18, 2020		Soil	M20-Jn38564			X	X

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Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Greencap NT P/L
Address: 11/14 Winnellie Road
Winnellie
NT 0800

Project Name: ONE RAIL - DIESEL SPILL INVESTIGATION
Project ID: J168829

Order No.: PO-275974
Report #: 727254
Phone: 61 8 8984 4244
Fax: 61 8 8984 3105

Received: Jun 23, 2020 2:35 PM
Due: Jun 25, 2020
Priority: 2 Day
Contact Name: Stuart Carroll

Eurofins Analytical Services Manager : Michael Morrison

DRAFT

Sample Detail						HOLD	BTEX	Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
11	SP-11	Jun 18, 2020		Soil	M20-Jn38565			X	X
12	SP-12	Jun 18, 2020		Soil	M20-Jn38566			X	X
13	SPQA01	Jun 18, 2020		Soil	M20-Jn38567	X			
14	TPQA01	Jun 19, 2020		Soil	M20-Jn38568	X			
15	TP30-0.0	Jun 19, 2020		Soil	M20-Jn38569	X			
16	TP30-0.6	Jun 19, 2020		Soil	M20-Jn38570			X	X
17	TP31-0.0	Jun 19, 2020		Soil	M20-Jn38571			X	X
18	TP32-0.0	Jun 19, 2020		Soil	M20-Jn38572	X			
19	TP32-0.15	Jun 19, 2020		Soil	M20-Jn38573	X			
20	TP32-0.40	Jun 19, 2020		Soil	M20-Jn38574	X			
21	RB08	Jun 18, 2020		Water	M20-Jn38575		X		
22	TB08	Jun 18, 2020		Water	M20-Jn38576		X		
Test Counts						6	2	14	14

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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.

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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	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	104			70-130	Pass	
TRH C10-C14	%	105			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	123			70-130	Pass	
Toluene	%	93			70-130	Pass	
Ethylbenzene	%	83			70-130	Pass	
m&p-Xylenes	%	76			70-130	Pass	
Xylenes - Total*	%	79			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	119			70-130	Pass	
TRH C6-C10	%	99			70-130	Pass	
TRH >C10-C16	%	100			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 C6-C9	M20-Jn38556	CP	%	96			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M20-Jn38556	CP	%	118			70-130	Pass	
Toluene	M20-Jn38556	CP	%	92			70-130	Pass	
Ethylbenzene	M20-Jn38556	CP	%	88			70-130	Pass	
m&p-Xylenes	M20-Jn38556	CP	%	72			70-130	Pass	
o-Xylene	M20-Jn38556	CP	%	87			70-130	Pass	
Xylenes - Total*	M20-Jn38556	CP	%	77			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					

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Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Naphthalene	M20-Jn38556	CP	%	119			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M20-Jn38565	CP	%	93			70-130	Pass	
TRH C10-C14	M20-Jn38565	CP	%	33			70-130	Fail	Q08
Spike - % Recovery									
BTEX				Result 1					
Benzene	M20-Jn38565	CP	%	114			70-130	Pass	
Toluene	M20-Jn38565	CP	%	86			70-130	Pass	
Ethylbenzene	M20-Jn38565	CP	%	84			70-130	Pass	
m&p-Xylenes	M20-Jn38565	CP	%	80			70-130	Pass	
o-Xylene	M20-Jn38565	CP	%	80			70-130	Pass	
Xylenes - Total*	M20-Jn38565	CP	%	80			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M20-Jn38565	CP	%	93			70-130	Pass	
TRH C6-C10	M20-Jn38565	CP	%	81			70-130	Pass	
TRH >C10-C16	M20-Jn38565	CP	%	29			70-130	Fail	Q08
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M20-Jn38555	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M20-Jn38555	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M20-Jn38555	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M20-Jn38555	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M20-Jn38555	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M20-Jn38555	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	M20-Jn38555	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M20-Jn38555	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M20-Jn38555	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M20-Jn38559	CP	%	3.5	2.9	19	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M20-Jn38564	CP	mg/kg	1700	2200	22	30%	Pass	
TRH C15-C28	M20-Jn38564	CP	mg/kg	6400	8000	22	30%	Pass	
TRH C29-C36	M20-Jn38564	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M20-Jn38564	CP	mg/kg	3600	4500	23	30%	Pass	
TRH >C16-C34	M20-Jn38564	CP	mg/kg	4400	5500	22	30%	Pass	
TRH >C34-C40	M20-Jn38564	CP	mg/kg	< 100	< 100	<1	30%	Pass	

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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
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.
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised By

Michael Morrison	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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.

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Greencap NT P/L
11/14 Winnellie Road
Winnellie
NT 0800

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Stuart Carroll**

Report **727254-W**
Project name ONE RAIL - DIESEL SPILL INVESTIGATION
Project ID J168829
Received Date Jun 23, 2020

Client Sample ID			**RB08**	**TB08**
Sample Matrix			**Water**	**Water**
Eurofins Sample No.			**M20-Jn38575**	**M20-Jn38576**
Date Sampled			**Jun 18, 2020**	**Jun 18, 2020**
Test/Reference	LOR	Unit		
BTEX				
Benzene	0.001	mg/L	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	90	89

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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
Eurofins | mgt Suite B1			
BTEX	Melbourne	Jun 24, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			

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eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

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Dandenong South VIC 3175
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NATA # 1261
Site # 1254 & 14271

Sydney
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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
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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

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Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name:	Greencap NT P/L	**Order No.:**	PO-275974
Address:	11/14 Winnellie Road Winnellie NT 0800	**Report #:**	727254
		Phone:	61 8 8984 4244
		Fax:	61 8 8984 3105
Project Name:	ONE RAIL - DIESEL SPILL INVESTIGATION		
Project ID:	J168829		

Received: Jun 23, 2020 2:35 PM
Due: Jun 25, 2020
Priority: 2 Day
Contact Name: Stuart Carroll

Eurofins Analytical Services Manager : Michael Morrison

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Sample Detail						HOLD	BTEX	Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	SP-01	Jun 18, 2020		Soil	M20-Jn38555			X	X
2	SP-02	Jun 18, 2020		Soil	M20-Jn38556			X	X
3	SP-03	Jun 18, 2020		Soil	M20-Jn38557			X	X
4	SP-04	Jun 18, 2020		Soil	M20-Jn38558			X	X
5	SP-05	Jun 18, 2020		Soil	M20-Jn38559			X	X
6	SP-06	Jun 18, 2020		Soil	M20-Jn38560			X	X
7	SP-07	Jun 18, 2020		Soil	M20-Jn38561			X	X
8	SP-08	Jun 18, 2020		Soil	M20-Jn38562			X	X
9	SP-09	Jun 18, 2020		Soil	M20-Jn38563			X	X
10	SP-10	Jun 18, 2020		Soil	M20-Jn38564			X	X

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ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

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Site # 23736

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43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

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Address: 11/14 Winnellie Road
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NT 0800

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DRAFT

Sample Detail						HOLD	BTEX	Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
11	SP-11	Jun 18, 2020		Soil	M20-Jn38565			X	X
12	SP-12	Jun 18, 2020		Soil	M20-Jn38566			X	X
13	SPQA01	Jun 18, 2020		Soil	M20-Jn38567	X			
14	TPQA01	Jun 19, 2020		Soil	M20-Jn38568	X			
15	TP30-0.0	Jun 19, 2020		Soil	M20-Jn38569	X			
16	TP30-0.6	Jun 19, 2020		Soil	M20-Jn38570			X	X
17	TP31-0.0	Jun 19, 2020		Soil	M20-Jn38571			X	X
18	TP32-0.0	Jun 19, 2020		Soil	M20-Jn38572	X			
19	TP32-0.15	Jun 19, 2020		Soil	M20-Jn38573	X			
20	TP32-0.40	Jun 19, 2020		Soil	M20-Jn38574	X			
21	RB08	Jun 18, 2020		Water	M20-Jn38575		X		
22	TB08	Jun 18, 2020		Water	M20-Jn38576		X		
Test Counts						6	2	14	14

eurofins | Environment Testing

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.

DRAFT

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	111			70-130	Pass	
Toluene	%	103			70-130	Pass	
Ethylbenzene	%	97			70-130	Pass	
m&p-Xylenes	%	94			70-130	Pass	
Xylenes - Total*	%	96			70-130	Pass	

DRAFT

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

Authorised By

Michael Morrison	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

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☐ **Brisbane Laboratory** Unit 1 21 Smallwood Place Murarrie QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory** Unit 2 9f 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	Greencap NT P/L	Project №	J168829
Address	11/14 Winnellie Road, Winnellie, NT, 0800	Project Name	One Rail Australia - Diesel Spill
Contact Name	Stuart Carroll	Project Manager	Stuart Carroll
Phone №	0466 776 038	EDD Format (Excel, EQuIS etc)	
Special Directions		Sampler(s)	Stuart Carroll
Purchase Order	276907	Handed over by	Stuart Carroll
Quote ID №		Email for Results	Stuart.Carroll@greencap.com.au & robin.birua@greencap.com.au

Containers (change container type & size if necessary)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked)

*Surcharge will apply

☐ Overnight (reporting by 9am)* ☐ Same day ◆ ☐ 1 day ◆ ☐ 2 days ◆ ☐ 3 days ◆ ☑ 5 days (Standard) ☐ Other( )

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix Solid (S) Water (W)	Suite B1	BTEX	500mL Plastic - Unpreserved	500mL Plastic - Sodium Thiosulfate	60mL Plastic - Metals	200mL Amber Glass	40mL VOA Glass Vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964 WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
3	MW01_3.0	15/07/20	S	1							1			
1	MW01A_3.1	16/07/20	S								1			Please hold
2	MW01A_5.0	16/07/20	S								1			Please hold
4	MW02_2.2	13/07/20	S	1							1			
5	MW02_5.2	13/07/20	S								1			Please hold
6	MW03_3.4	15/07/20	S	1							1			
6	MW03_7.5	15/07/20	S								1			Please hold
6	MW04_3.5	16/07/20	S	1							1			
3	NDTP07	16/07/20	S	1							1			
1	NDTP08	16/07/20	S	1							1			
2	NDTP09	16/07/20	S	1							1			
4	NDTP10	16/07/20	S	1							1			
5	TP33_0.0	16/07/20	S								1			Please hold
6	TP34_0.35	17/07/20	S	1							1			
6	TP34_0.4	17/07/20	S								1			Please hold
6	QA07	15/07/20	S	1							1			
	RB	13/07/20	W	1				1						
	TB	13/07/20	W		1									
	RB	15/07/20	W	1					2					
	TB	15/07/20	W		1			1						
	RB	16/07/20	W	1					2					
	TB	16/07/20	W		1			1						
									2					
	Add new rows	Total Counts		13	3			3	6		16			

Method of Shipment: Courier (#) Hand Delivered Postal Name Signature

Eurofins | mgt Laboratory Use Only — Received By: Ashvin Desai (SYD | BNE | MEL | PER | ADL | NTL | DRW) Signature: adesai Date: 20/07/20 Time: 12:50PM Temperature: 19.3C

Received By (SYD | BNE | MEL | PER | ADL | NTL | DRW) Signature Date Time Report №: 732705

DRAFT

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise.

eurofins | Environment Testing

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NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**Greencap NT P/L**
Contact name:	Stuart Carroll
Project name:	ONE RAIL AUSTRALIA- DIESEL SPILL
Project ID:	J168829
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Jul 20, 2020 12:50 PM
Eurofins reference:	**732705**

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).

Contact notes

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

Michael Morrison on Phone : 03 8564 5933 or by e.mail: MichaelMorrison@eurofins.com

Results will be delivered electronically via e.mail to Stuart Carroll - stuart.carroll@greencap.com.au.

Note: A copy of these results will also be delivered to the general Greencap NT P/L email address.

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Greencap NT P/L
11/14 Winnellie Road
Winnellie
NT 0800

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Stuart Carroll**

Report **732705-S**
Project name ONE RAIL AUSTRALIA- DIESEL SPILL
Project ID J168829
Received Date Jul 20, 2020

Client Sample ID			**MW01_3.0**	**MW02_2.2**	**MW03_3.4**	**MW04_3.5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M20-JI30967**	**M20-JI30968**	**M20-JI30969**	**M20-JI30970**
Date Sampled			**Jul 15, 2020**	**Jul 13, 2020**	**Jul 15, 2020**	**Jul 16, 2020**
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-C36 (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	%	63	57	64	58
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
% Moisture	1	%	13	12	10	19

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Client Sample ID			NDTP07	NDTP08	NDTP09	NDTP10
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-JI30971	M20-JI30972	M20-JI30973	M20-JI30974
Date Sampled			Jul 16, 2020	Jul 16, 2020	Jul 16, 2020	Jul 16, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	270	< 20	97	< 20
TRH C10-C14	20	mg/kg	19000	< 20	8400	< 20
TRH C15-C28	50	mg/kg	33000	< 50	16000	< 50
TRH C29-C36	50	mg/kg	96	< 50	200	< 50
TRH C10-C36 (Total)	50	mg/kg	52096	< 50	24600	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.4	< 0.1	< 0.5	< 0.1
Toluene	0.1	mg/kg	11	< 0.1	1.2	< 0.1
Ethylbenzene	0.1	mg/kg	18	< 0.1	3.0	< 0.1
m&p-Xylenes	0.2	mg/kg	53	< 0.2	11	< 0.2
o-Xylene	0.1	mg/kg	33	< 0.1	6.5	< 0.1
Xylenes - Total*	0.3	mg/kg	86	< 0.3	17	< 0.3
4-Bromofluorobenzene (surr.)	1	%	87	56	106	99
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	2.5	< 0.5	[R16]< 2.5	< 0.5
TRH C6-C10	20	mg/kg	700	< 20	270	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	590	< 20	250	< 20
TRH >C10-C16	50	mg/kg	31000	< 50	14000	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	30997.5	< 50	14000	< 50
TRH >C16-C34	100	mg/kg	20000	< 100	10000	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	510	< 100
TRH >C10-C40 (total)*	100	mg/kg	51000	< 100	24510	< 100
% Moisture	1	%	7.3	11	6.0	3.2

Client Sample ID			TP34_0.35	QA07
Sample Matrix			Soil	Soil
Eurofins Sample No.			M20-JI30975	M20-JI30976
Date Sampled			Jul 17, 2020	Jul 15, 2020
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20
TRH C15-C28	50	mg/kg	67	< 50
TRH C29-C36	50	mg/kg	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	67	< 50
BTEX				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	100	93

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Client Sample ID			TP34_0.35	QA07
Sample Matrix			Soil	Soil
Eurofins Sample No.			M20-JI30975	M20-JI30976
Date Sampled			Jul 17, 2020	Jul 15, 2020
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100
% Moisture	1	%	4.5	12

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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
Eurofins Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jul 21, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Jul 21, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jul 21, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jul 21, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
% Moisture	Melbourne	Jul 20, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

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Site # 1254 & 14271

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NATA # 1261 Site # 18217

Brisbane
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Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name:	Greencap NT P/L	**Order No.:**	276907
Address:	11/14 Winnellie Road Winnellie NT 0800	**Report #:**	732705
		Phone:	61 8 8984 4244
		Fax:	61 8 8984 3105
Project Name:	ONE RAIL AUSTRALIA- DIESEL SPILL		
Project ID:	J168829		

Received:	Jul 20, 2020 12:50 PM	
Due:	Jul 27, 2020	
Priority:	5 Day	
Contact Name:	Stuart Carroll	

Eurofins Analytical Services Manager : Michael Morrison

Sample Detail						HOLD	BTEX	Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	MW01_3.0	Jul 15, 2020		Soil	M20-Jl30967			X	X
2	MW02_2.2	Jul 13, 2020		Soil	M20-Jl30968			X	X
3	MW03_3.4	Jul 15, 2020		Soil	M20-Jl30969			X	X
4	MW04_3.5	Jul 16, 2020		Soil	M20-Jl30970			X	X
5	NDTP07	Jul 16, 2020		Soil	M20-Jl30971			X	X
6	NDTP08	Jul 16, 2020		Soil	M20-Jl30972			X	X
7	NDTP09	Jul 16, 2020		Soil	M20-Jl30973			X	X
8	NDTP10	Jul 16, 2020		Soil	M20-Jl30974			X	X
9	TP34_0.35	Jul 17, 2020		Soil	M20-Jl30975			X	X
10	QA07	Jul 15, 2020		Soil	M20-Jl30976			X	X

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Company Name: Greencap NT P/L
Address: 11/14 Winnellie Road
Winnellie
NT 0800

Project Name: ONE RAIL AUSTRALIA- DIESEL SPILL
Project ID: J168829

Order No.: 276907
Report #: 732705
Phone: 61 8 8984 4244
Fax: 61 8 8984 3105

Received: Jul 20, 2020 12:50 PM
Due: Jul 27, 2020
Priority: 5 Day
Contact Name: Stuart Carroll

Eurofins Analytical Services Manager : Michael Morrison

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Sample Detail						HOLD	BTEX	Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
11	RB	Jul 13, 2020		Water	M20-JI30977				X
12	TB	Jul 13, 2020		Water	M20-JI30978		X		
13	RB	Jul 15, 2020		Water	M20-JI30979				X
14	TB	Jul 15, 2020		Water	M20-JI30980		X		
15	TB	Jul 16, 2020		Water	M20-JI30981		X		
16	RB	Jul 16, 2020		Water	M20-JI30982				X
17	MW01A_3.1	Jul 16, 2020		Soil	M20-JI30983	X			
18	MW01A_5.0	Jul 16, 2020		Soil	M20-JI30984	X			
19	MW02_5.2	Jul 13, 2020		Soil	M20-JI30985	X			
20	MW03_7.5	Jul 15, 2020		Soil	M20-JI30986	X			
21	TP33_0.0	Jul 16, 2020		Soil	M20-JI30987	X			
22	TP34_0.4	Jul 17, 2020		Soil	M20-JI30988	X			
Test Counts						6	3	10	13

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.

DRAFT

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	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	102			70-130	Pass	
TRH C10-C14	%	108			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	108			70-130	Pass	
Toluene	%	115			70-130	Pass	
Ethylbenzene	%	104			70-130	Pass	
m&p-Xylenes	%	103			70-130	Pass	
Xylenes - Total*	%	104			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	108			70-130	Pass	
TRH C6-C10	%	97			70-130	Pass	
TRH >C10-C16	%	101			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 C6-C9	M20-Jl29965	NCP	%	110			70-130	Pass	
TRH C10-C14	M20-Jl29921	NCP	%	127			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M20-Jl29965	NCP	%	98			70-130	Pass	
Toluene	M20-Jl29965	NCP	%	119			70-130	Pass	
Ethylbenzene	M20-Jl29965	NCP	%	104			70-130	Pass	
m&p-Xylenes	M20-Jl29965	NCP	%	106			70-130	Pass	
o-Xylene	M20-Jl29965	NCP	%	112			70-130	Pass	
Xylenes - Total*	M20-Jl29965	NCP	%	108			70-130	Pass	
Spike - % Recovery									

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Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M20-Jl29965	NCP	%	94			70-130	Pass	
TRH C6-C10	M20-Jl29965	NCP	%	106			70-130	Pass	
TRH >C10-C16	M20-Jl29921	NCP	%	126			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M20-Jl30970	CP	%	19	18	4.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M20-Jl30972	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M20-Jl30972	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M20-Jl30972	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M20-Jl30972	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M20-Jl30972	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M20-Jl30972	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	M20-Jl30972	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M20-Jl30972	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M20-Jl30972	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M20-Jl30975	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M20-Jl30975	CP	mg/kg	67	70	3.0	30%	Pass	
TRH C29-C36	M20-Jl30975	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M20-Jl30975	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M20-Jl30975	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M20-Jl30975	CP	mg/kg	< 100	< 100	<1	30%	Pass	

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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
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.
R16	The LORs have been raised due to the high concentration of one or more analytes

Authorised By

Michael Morrison	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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Greencap NT P/L
11/14 Winnellie Road
Winnellie
NT 0800

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Stuart Carroll**

Report **732705-W**
Project name ONE RAIL AUSTRALIA- DIESEL SPILL
Project ID J168829
Received Date Jul 20, 2020

Client Sample ID			**RB**	**TB**	**RB**	**TB**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**M20-JI30977**	**M20-JI30978**	**M20-JI30979**	**M20-JI30980**
Date Sampled			**Jul 13, 2020**	**Jul 13, 2020**	**Jul 15, 2020**	**Jul 15, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	-	< 0.02	-
TRH C10-C14	0.05	mg/L	< 0.05	-	< 0.05	-
TRH C15-C28	0.1	mg/L	< 0.1	-	< 0.1	-
TRH C29-C36	0.1	mg/L	< 0.1	-	< 0.1	-
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	-	< 0.1	-
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	96	88	98	97
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	< 0.01	-	< 0.01	-
TRH C6-C10	0.02	mg/L	< 0.02	-	< 0.02	-
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	-	< 0.02	-
TRH >C10-C16	0.05	mg/L	< 0.05	-	< 0.05	-
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	-	< 0.05	-
TRH >C16-C34	0.1	mg/L	< 0.1	-	< 0.1	-
TRH >C34-C40	0.1	mg/L	< 0.1	-	< 0.1	-
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	-	< 0.1	-

Client Sample ID			**TB**	**RB**
Sample Matrix			**Water**	**Water**
Eurofins Sample No.			**M20-JI30981**	**M20-JI30982**
Date Sampled			**Jul 16, 2020**	**Jul 16, 2020**
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	0.02	mg/L	-	< 0.02
TRH C10-C14	0.05	mg/L	-	0.17
TRH C15-C28	0.1	mg/L	-	0.1
TRH C29-C36	0.1	mg/L	-	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	-	0.27

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Client Sample ID			TB	RB
Sample Matrix			Water	Water
Eurofins Sample No.			M20-JI30981	M20-JI30982
Date Sampled			Jul 16, 2020	Jul 16, 2020
Test/Reference	LOR	Unit		
BTEX				
Benzene	0.001	mg/L	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	95	94
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.01	mg/L	-	< 0.01
TRH C6-C10	0.02	mg/L	-	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	-	< 0.02
TRH >C10-C16	0.05	mg/L	-	0.10
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	-	0.1
TRH >C16-C34	0.1	mg/L	-	0.1
TRH >C34-C40	0.1	mg/L	-	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	-	0.2

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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
Eurofins Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jul 21, 2020	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Jul 21, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jul 21, 2020	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jul 21, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			

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Company Name:	Greencap NT P/L	**Order No.:**	276907
Address:	11/14 Winnellie Road Winnellie NT 0800	**Report #:**	732705
		Phone:	61 8 8984 4244
		Fax:	61 8 8984 3105
Project Name:	ONE RAIL AUSTRALIA- DIESEL SPILL		
Project ID:	J168829		

Received:	Jul 20, 2020 12:50 PM	
Due:	Jul 27, 2020	
Priority:	5 Day	
Contact Name:	Stuart Carroll	

Eurofins Analytical Services Manager : Michael Morrison

Sample Detail						HOLD	BTEX	Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	MW01_3.0	Jul 15, 2020		Soil	M20-Jl30967			X	X
2	MW02_2.2	Jul 13, 2020		Soil	M20-Jl30968			X	X
3	MW03_3.4	Jul 15, 2020		Soil	M20-Jl30969			X	X
4	MW04_3.5	Jul 16, 2020		Soil	M20-Jl30970			X	X
5	NDTP07	Jul 16, 2020		Soil	M20-Jl30971			X	X
6	NDTP08	Jul 16, 2020		Soil	M20-Jl30972			X	X
7	NDTP09	Jul 16, 2020		Soil	M20-Jl30973			X	X
8	NDTP10	Jul 16, 2020		Soil	M20-Jl30974			X	X
9	TP34_0.35	Jul 17, 2020		Soil	M20-Jl30975			X	X
10	QA07	Jul 15, 2020		Soil	M20-Jl30976			X	X

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Company Name: Greencap NT P/L
Address: 11/14 Winnellie Road
Winnellie
NT 0800

Project Name: ONE RAIL AUSTRALIA- DIESEL SPILL
Project ID: J168829

Order No.: 276907
Report #: 732705
Phone: 61 8 8984 4244
Fax: 61 8 8984 3105

Received: Jul 20, 2020 12:50 PM
Due: Jul 27, 2020
Priority: 5 Day
Contact Name: Stuart Carroll

Eurofins Analytical Services Manager : Michael Morrison

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Sample Detail						HOLD	BTEX	Moisture Set	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
11	RB	Jul 13, 2020		Water	M20-JI30977				X
12	TB	Jul 13, 2020		Water	M20-JI30978		X		
13	RB	Jul 15, 2020		Water	M20-JI30979				X
14	TB	Jul 15, 2020		Water	M20-JI30980		X		
15	TB	Jul 16, 2020		Water	M20-JI30981		X		
16	RB	Jul 16, 2020		Water	M20-JI30982				X
17	MW01A_3.1	Jul 16, 2020		Soil	M20-JI30983	X			
18	MW01A_5.0	Jul 16, 2020		Soil	M20-JI30984	X			
19	MW02_5.2	Jul 13, 2020		Soil	M20-JI30985	X			
20	MW03_7.5	Jul 15, 2020		Soil	M20-JI30986	X			
21	TP33_0.0	Jul 16, 2020		Soil	M20-JI30987	X			
22	TP34_0.4	Jul 17, 2020		Soil	M20-JI30988	X			
Test Counts						6	3	10	13

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.

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Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	113			70-130	Pass	
TRH C10-C14	%	83			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	90			70-130	Pass	
Toluene	%	108			70-130	Pass	
Ethylbenzene	%	98			70-130	Pass	
m&p-Xylenes	%	94			70-130	Pass	
Xylenes - Total*	%	93			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	85			70-130	Pass	
TRH C6-C10	%	111			70-130	Pass	
TRH >C10-C16	%	81			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	M20-JI39450	NCP	%	82			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M20-JI39450	NCP	%	80			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M20-JI39424	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M20-JI39424	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M20-JI39424	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

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Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M20-JI39424	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M20-JI39424	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M20-JI39424	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

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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
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.

Authorised By

Michael Morrison	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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CHAIN OF CUSTODY RECORD

Eurofins Env. Testing Australia Pty Ltd (ABN 50 005 085 521)

Sydney Laboratory — Unit 1 / 179 Magowar Road Girraween NSW 2145 — 02 9900 8400 — EnviroSampleAS@eurofins.com

Brisbane Laboratory — Unit 1 / 21 Smallwood Place Murarrie QLD 4172 — 07 3902 4600 — EnviroSampleQL@eurofins.com

Perth Laboratory — Unit 2 / 51 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	Greencap NT P/L
Address	11/14 Winnellie Road, Winnellie, NT, 0800
Contact Name	Stuart Carroll
Phone No	0466 776 038
Special Directions	
Purchase Order	278070
Quote ID No	

Project No	J168829
Project Name	One Rail - DSI/Validation
Project Manager	Stuart Carroll
EDD Format (Excel, Esdat etc)	
Sampler(s)	Stuart Carroll
Handed over by	N/A
Email to Results	Stuart.Carroll@greencap.com.au

Containers (Please confirm type & size if necessary) — Required Turnaround Time (TAT) (Default will be 5 days if not given)

- Overnight (response by 9am)
- Same day
- 1 day
- 2 days
- 3 days
- 5 days (Standard)
- Other

Microbiology not ngaity

No	Client Sample ID	Depth (m)	Date	Matrix (Soil (S) Water (W))	Suite B1	BTEX	500mL Plastic - Unpreserved	500mL Plastic - Sodium Thiosulfate	60mL Plastic - Metals	200mL Amber Glass	40mL VOA Glass Vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (please list e.g. AS5664.1(a) Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	TP35_1.05	1.05	24/08/20	S	1								1		
2	TP36_0.0	0.00	26/08/20	S	0								1		Please Hold
3	TP36_0.5	0.50	26/08/20	S	0								1		Please Hold
4	TP36_1.0	1.00	26/08/20	S	1								1		
5	TP36_1.5	1.50	26/08/20	S	1								1		
6	TP37_1.6	1.60	26/08/20	S	1								1		
7	V20	0.00	24/08/20	S	1								1		
8	V21	0.00	24/08/20	S	1								1		
9	V22	0.00	24/08/20	S	1								1		
10	V23	0.00	24/08/20	S	1								1		
11	V24	0.00	24/08/20	S	1								1		
12	V25	0.00	24/08/20	S	1								1		
13	V26	0.00	24/08/20	S	1								1		
14	V27	0.00	24/08/20	S	1								1		
15	V28	0.00	24/08/20	S	1								1		
16	V29	0.00	24/08/20	S	1								1		
17	V30	0.00	24/08/20	S	1								1		
18	V31	0.00	25/08/20	S	0								1		Please Hold
19	V32	0.00 (N)	25/08/20	S	0								1		Please Hold
20	V33	0.20 (N)	25/08/20	S	0								1		Please Hold
21	V34	0.00 (B)	25/08/20	S	0								1		Please Hold
22	V35	0.20 (S)	25/08/20	S	0								1		Please Hold
23	V36	0.00 (S)	25/08/20	S	0								1		Please Hold
24	V37	0.00 (N)	25/08/20	S	0								1		Please Hold
25	V38	0.20 (N)	25/08/20	S	0								1		Please Hold
26	V39	0.00 (B)	25/08/20	S	0								1		Please Hold
27	V40	0.20 (S)	25/08/20	S	0								1		Please Hold
28	V41	0.00 (S)	25/08/20	S	0								1		Please Hold
29	V42	0.00 (N)	25/08/20	S	0								1		Please Hold
30	V43	0.20 (N)	25/08/20	S	0								1		Please Hold
31	V44	0.00 (B)	25/08/20	S	0								1		Please Hold
32	V45	0.20 (S)	25/08/20	S	0								1		Please Hold
33	V46	0.00 (S)	25/08/20	S	0								1		Please Hold
34	V47	0.00 (N)	25/08/20	S	0								1		Please Hold
35	V48	0.20 (N)	25/08/20	S	0								1		Please Hold
36	V49	0.00 (B)	25/08/20	S	0								1		Please Hold
37	V50	0.20 (S)	25/08/20	S	0								1		Please Hold
38	V51	0.00 (S)	25/08/20	S	0								1		Please Hold
39	V52	0.00 (N)	25/08/20	S	0								1		Please Hold
40	V53	0.20 (N)	25/08/20	S	0								1		Please Hold
41	V54	0.00 (B)	25/08/20	S	0								1		Please Hold
42	V55	0.20 (S)	25/08/20	S	0								1		Please Hold
43	V56	0.00 (S)	25/08/20	S	0								1		Please Hold
44	V57	1.50 (N)	26/08/20	S	1								1		Please Hold
45	V58	0.75 (N)	26/08/20	S	0								1		
46	V59	0.00 (N)	26/08/20	S	0								1		Please Hold
47	V60	1.50 (E)	26/08/20	S	1								1		Please Hold
48	V61	0.75 (E)	26/08/20	S	0								1		
49	V62	0.00 (E)	26/08/20	S	0								1		Please Hold
50	V63	1.75 (B)	26/08/20	S	1								1		Please Hold
51	V64	1.50 (S)	26/08/20	S	1								1		
52	V65	0.75 (S)	26/08/20	S	1								1		
53	V66	0.00 (S)	26/08/20	S	1								1		
54	V67	1.50 (W)	26/08/20	S	1								1		
55	V68	0.75 (W)	26/08/20	S	1								1		
56	V69	0.00 (W)	26/08/20	S	1								1		
57	V70	2.00 (B)	26/08/20	S	1								1		
58	V71	1.50 (W)	26/08/20	S	1								1		
59	V72	0.75 (W)	26/08/20	S	1								1		
60	V73	0.00 (W)	26/08/20	S	1								1		
61	V74	1.50 (S)	26/08/20	S	1								1		
62	V75	0.75 (S)	26/08/20	S	0								1		
63	V76	0.00 (S)	26/08/20	S	0								1		Please Hold
64	V77	2.00 (B)	26/08/20	S	1								1		Please Hold
65	V78	1.50 (E)	24/08/20	S	1								1		
66	V79	0.75 (E)	26/08/20	S	1								1		
67	V80	0.00 (E)	26/08/20	S	1								1		
68	V81	1.75 (N)	26/08/20	S	1								1		
69	V82	1.00 (N)	26/08/20	S	0								1		
70	V83	0.00 (N)	26/08/20	S	0								1		Please Hold
71	V84	2.00 (B)	26/08/20	S	1								1		Please Hold
72	QA01	-	24/08/20	S	1								1		
73	QA03	-	26/08/20	S	1								1		
74	QA05	-	26/08/20	S	1								1		
75													1		
76	RB	-	24/08/20	W	1										
77	RB	-	25/08/20	W	1										
78	RB	-	26/08/20	W	1										
79	TB	-	24/08/20	W		1									
80	TB	-	25/08/20	W		1									
81	TB	-	26/08/20	W		1									
	Add new rows		Total Counts		77		1	1	1	2	2	2	74		

24 Hr TAT Please

DRAFT

Method of Shipment: Courier (#) — Hand Delivered

Eurofins | mgt Laboratory Use Only

	Received By	Print	Name	Signature	Date	Time
Sydney	Ashvin Desai			adai	27/08/20	09:00AM
Brisbane						

Sydney: SYD | ANE | MEL | PER | ADL | NTL | DRW

Brisbane: BYD | ANE | MEL | PER | ADL | NTL | DRW

Temperature: 5.5C

Report No: 740295

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

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#AU09_EnviroSampleDRW

From: Stuart Carroll <Stuart.Carroll@greencap.com.au>
Sent: Thursday, 27 August 2020 9:54 AM
To: #AU09_EnviroSampleDRW
Cc: Michael Morrison
Subject: RE: [EXT]:RE: Soil Sample D/O

Hi Ashvin,

Apologies, 2 day TAT for J168829.

Cheers

Stuart Carroll

Senior Consultant - Environment | Greencap

Unit 11 / 14 Winnellie Road Winnellie, NT 0820
D: 08 7906 1312 | **M:** 0466 776 038 | **E:** Stuart.Carroll@greencap.com.au | **in:** LinkedIn



DRAFT

From: EnviroSampleDRW@eurofins.com <EnviroSampleDRW@eurofins.com>
Sent: Thursday, 27 August 2020 8:58 AM
To: Stuart Carroll <Stuart.Carroll@greencap.com.au>
Cc: MichaelMorrison@eurofins.com
Subject: [EXT]:RE: Soil Sample D/O

CAUTION: This email originated from outside of the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Thanks Stuart!!
Can you please confirm TAT for the project J168829 because its mentioned 24 hr & ticked for 1D & 2Day as well .

Kind Regards,
Ashvin Desai
Sample Receipt Officer

Eurofins
3/83 Coonawarra Road
Winnellie NT 0820
AUSTRALIA
Phone: +61 8 8154 3103
Office Contact: +61 428 489 614

Email : EnviroSampleDRW@eurofins.com
Website : http://environment.eurofins.com.au

From: Stuart Carroll <Stuart.Carroll@greencap.com.au>
Sent: Wednesday, 26 August 2020 7:29 PM
To: #AU09_EnviroSampleDRW <EnviroSampleDRW@eurofins.com>
Cc: Michael Morrison <MichaelMorrison@eurofins.com>
Subject: Soil Sample D/O

Hi Ashvin,

Please see the attached COCs for the two batches of soil samples which I will drop off shortly.

Regards

Stuart Carroll

Senior Consultant - Environment | Greencap

Unit 11 / 14 Winnellie Road Winnellie, NT 0820
D: 08 7906 1312 | **M:** 0466 776 038 | **E:** Stuart.Carroll@greencap.com.au | **in:** LinkedIn



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NATA # 1261 Site # 20794

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Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Sample Receipt Advice

Company name:	Greencap NT P/L
Contact name:	Stuart Carroll
Project name:	ONE RAIL-DSI/VALIDATION
Project ID:	J168829
Turnaround time:	2 Day
Date/Time received	Aug 27, 2020 9:00 AM
Eurofins reference	740295

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.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

DRAFT

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Michael Morrison on phone : 03 8564 5933 or by email: MichaelMorrison@eurofins.com

Results will be delivered electronically via email to Stuart Carroll - stuart.carroll@greencap.com.au.

Note: A copy of these results will also be delivered to the general Greencap NT P/L email address.

Greencap NT P/L
11/14 Winnellie Road
Winnellie
NT 0800

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Stuart Carroll**

Report **740295-S**
Project name ONE RAIL-DSI/VALIDATION
Project ID J168829
Received Date Aug 27, 2020

Client Sample ID			**TP35_1.05**	**TP36_1.0**	**TP36_1.5**	**TP37_1.6**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M20-Au42719**	**M20-Au42720**	**M20-Au42721**	**M20-Au42722**
Date Sampled			**Aug 24, 2020**	**Aug 26, 2020**	**Aug 26, 2020**	**Aug 26, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	23
TRH C10-C14	20	mg/kg	2000	< 20	< 20	2200
TRH C15-C28	50	mg/kg	6000	< 50	< 50	4200
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	8000	< 50	< 50	6400
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	0.2
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.7
m&p-Xylenes	0.2	mg/kg	0.2	< 0.2	< 0.2	2.6
o-Xylene	0.1	mg/kg	0.3	< 0.1	< 0.1	1.8
Xylenes - Total*	0.3	mg/kg	0.5	< 0.3	< 0.3	4.4
4-Bromofluorobenzene (surr.)	1	%	103	95	89	114
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	30	< 20	< 20	91
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	30	< 20	< 20	86
TRH >C10-C16	50	mg/kg	3700	< 50	< 50	3400
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	3700	< 50	< 50	3400
TRH >C16-C34	100	mg/kg	4800	< 100	< 100	3400
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	8500	< 100	< 100	6800
% Moisture	1	%	11	11	11	11

DRAFT

Client Sample ID			V20	V21	V22	V23
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Au42723	M20-Au42724	M20-Au42725	M20-Au42726
Date Sampled			Aug 24, 2020	Aug 24, 2020	Aug 24, 2020	Aug 24, 2020
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	1500	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	1500	< 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	%	93	93	96	93
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	54	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	54	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	1500	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	1554	< 100	< 100	< 100
% Moisture	1	%	1.6	6.8	6.9	5.8

Client Sample ID			V24	V25	V26	V27
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Au42727	M20-Au42728	M20-Au42729	M20-Au42730
Date Sampled			Aug 24, 2020	Aug 24, 2020	Aug 24, 2020	Aug 24, 2020
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-C36 (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	%	105	104	91	91

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Client Sample ID			V24	V25	V26	V27
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Au42727	M20-Au42728	M20-Au42729	M20-Au42730
Date Sampled			Aug 24, 2020	Aug 24, 2020	Aug 24, 2020	Aug 24, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
% Moisture	1	%	6.6	8.3	7.2	7.1

Client Sample ID			V28	V29	V30	V57
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Au42731	M20-Au42732	M20-Au42733	M20-Au42734
Date Sampled			Aug 24, 2020	Aug 24, 2020	Aug 24, 2020	Aug 26, 2020
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	23	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	110	210	54	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	133	210	54	< 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	%	96	99	108	104
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	160	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	160	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	220	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	160	220	< 100	< 100
% Moisture	1	%	7.7	4.4	1.2	9.2

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Client Sample ID			V60	V63	V64	V65
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Au42735	M20-Au42736	M20-Au42737	M20-Au42738
Date Sampled			Aug 26, 2020	Aug 26, 2020	Aug 26, 2020	Aug 26, 2020
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	31	< 20	< 20
TRH C15-C28	50	mg/kg	73	100	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	73	131	< 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	%	102	100	102	93
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	180	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	180	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	180	< 100	< 100
% Moisture	1	%	13	11	11	10.0

Client Sample ID			V66	V67	V68	V69
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Au42739	M20-Au42740	M20-Au42741	M20-Au42742
Date Sampled			Aug 26, 2020	Aug 26, 2020	Aug 26, 2020	Aug 26, 2020
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	67	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	360	< 50	< 50	130
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	427	< 50	< 50	130
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	%	98	97	94	92

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Client Sample ID			V66	V67	V68	V69
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Au42739	M20-Au42740	M20-Au42741	M20-Au42742
Date Sampled			Aug 26, 2020	Aug 26, 2020	Aug 26, 2020	Aug 26, 2020
Test/Reference	LOR	Unit				
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	150	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	150	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	280	< 100	< 100	140
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	430	< 100	< 100	140
% Moisture	1	%	4.4	10	9.6	8.4

Client Sample ID			V70	V71	V72	V73
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Au42743	M20-Au42744	M20-Au42745	M20-Au42746
Date Sampled			Aug 26, 2020	Aug 26, 2020	Aug 26, 2020	Aug 26, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	64	< 20
TRH C10-C14	20	mg/kg	< 20	50	3800	150
TRH C15-C28	50	mg/kg	< 50	88	7100	420
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	138	10900	570
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	0.2	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	0.9	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	4.0	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	2.0	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	6.0	< 0.3
4-Bromofluorobenzene (surr.)	1	%	102	92	105	89
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	300	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	290	< 20
TRH >C10-C16	50	mg/kg	< 50	160	5700	270
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	160	5700	270
TRH >C16-C34	100	mg/kg	< 100	< 100	6000	330
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	160	11700	600
% Moisture	1	%	13	13	13	9.5

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Client Sample ID			V74	V77	V78	V79
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Au42747	M20-Au42748	M20-Au42749	M20-Au42750
Date Sampled			Aug 26, 2020	Aug 26, 2020	Aug 24, 2020	Aug 26, 2020
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	240	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	590	63	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	830	63	< 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	%	111	107	87	98
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	410	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	410	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	470	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	880	< 100	< 100	< 100
% Moisture	1	%	11	12	10	8.5

Client Sample ID			V80	V81	V84	QA01
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Au42751	M20-Au42752	M20-Au42753	M20-Au42754
Date Sampled			Aug 26, 2020	Aug 26, 2020	Aug 26, 2020	Aug 24, 2020
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	830	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	1300	< 50	62
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	2130	< 50	62
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	0.5	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	0.4	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	0.8	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	89	101	105	96

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Client Sample ID			V80	V81	V84	QA01
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Au42751	M20-Au42752	M20-Au42753	M20-Au42754
Date Sampled			Aug 26, 2020	Aug 26, 2020	Aug 26, 2020	Aug 24, 2020
Test/Reference	LOR	Unit				
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	37	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	36	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	1200	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	1200	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	1000	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	2200	< 100	< 100
% Moisture	1	%	8.1	11	12	5.8

Client Sample ID			QA03	QA05
Sample Matrix			Soil	Soil
Eurofins Sample No.			M20-Au42755	M20-Au42756
Date Sampled			Aug 26, 2020	Aug 26, 2020
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50
BTEX				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	92	92
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100
% Moisture	1	%	8.6	12

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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
Eurofins Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Aug 28, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Aug 28, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Aug 28, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Aug 28, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
% Moisture	Melbourne	Aug 27, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

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Company Name:	Greencap NT P/L	**Order No.:**	278070
Address:	11/14 Winnellie Road Winnellie NT 0800	**Report #:**	740295
		Phone:	61 8 8984 4244
		Fax:	61 8 8984 3105
Project Name:	ONE RAIL-DSI/VALIDATION		
Project ID:	J168829		

Received:	Aug 27, 2020 9:00 AM	
Due:	Aug 31, 2020	
Priority:	2 Day	
Contact Name:	Stuart Carroll	

Eurofins Analytical Services Manager : Michael Morrison

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Sample Detail						HOLD	BTEX	Moisture Set	Eurofins Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
Newcastle Laboratory									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	TP35_1.05	Aug 24, 2020		Soil	M20-Au42719			X	X
2	TP36_1.0	Aug 26, 2020		Soil	M20-Au42720			X	X
3	TP36_1.5	Aug 26, 2020		Soil	M20-Au42721			X	X
4	TP37_1.6	Aug 26, 2020		Soil	M20-Au42722			X	X
5	V20	Aug 24, 2020		Soil	M20-Au42723			X	X
6	V21	Aug 24, 2020		Soil	M20-Au42724			X	X
7	V22	Aug 24, 2020		Soil	M20-Au42725			X	X
8	V23	Aug 24, 2020		Soil	M20-Au42726			X	X
9	V24	Aug 24, 2020		Soil	M20-Au42727			X	X

eurofins | Environment Testing

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IANZ # 1290

Company Name:	Greencap NT P/L	**Order No.:**	278070
Address:	11/14 Winnellie Road Winnellie NT 0800	**Report #:**	740295
		Phone:	61 8 8984 4244
		Fax:	61 8 8984 3105
Project Name:	ONE RAIL-DSI/VALIDATION		
Project ID:	J168829		

Received:	Aug 27, 2020 9:00 AM	
Due:	Aug 31, 2020	
Priority:	2 Day	
Contact Name:	Stuart Carroll	

Eurofins Analytical Services Manager : Michael Morrison

Sample Detail						HOLD	BTEX	Moisture Set	Eurofins Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
10	V25	Aug 24, 2020		Soil	M20-Au42728			X	X
11	V26	Aug 24, 2020		Soil	M20-Au42729			X	X
12	V27	Aug 24, 2020		Soil	M20-Au42730			X	X
13	V28	Aug 24, 2020		Soil	M20-Au42731			X	X
14	V29	Aug 24, 2020		Soil	M20-Au42732			X	X
15	V30	Aug 24, 2020		Soil	M20-Au42733			X	X
16	V57	Aug 26, 2020		Soil	M20-Au42734			X	X
17	V60	Aug 26, 2020		Soil	M20-Au42735			X	X
18	V63	Aug 26, 2020		Soil	M20-Au42736			X	X
19	V64	Aug 26, 2020		Soil	M20-Au42737			X	X
20	V65	Aug 26, 2020		Soil	M20-Au42738			X	X
21	V66	Aug 26, 2020		Soil	M20-Au42739			X	X
22	V67	Aug 26, 2020		Soil	M20-Au42740			X	X

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Company Name: Greencap NT P/L
Address: 11/14 Winnellie Road
Winnellie
NT 0800

Project Name: ONE RAIL-DSI/VALIDATION
Project ID: J168829

Order No.: 278070
Report #: 740295
Phone: 61 8 8984 4244
Fax: 61 8 8984 3105

Received: Aug 27, 2020 9:00 AM
Due: Aug 31, 2020
Priority: 2 Day
Contact Name: Stuart Carroll

Eurofins Analytical Services Manager : Michael Morrison

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Sample Detail						HOLD	BTEX	Moisture Set	Eurofins Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
23	V68	Aug 26, 2020		Soil	M20-Au42741			X	X
24	V69	Aug 26, 2020		Soil	M20-Au42742			X	X
25	V70	Aug 26, 2020		Soil	M20-Au42743			X	X
26	V71	Aug 26, 2020		Soil	M20-Au42744			X	X
27	V72	Aug 26, 2020		Soil	M20-Au42745			X	X
28	V73	Aug 26, 2020		Soil	M20-Au42746			X	X
29	V74	Aug 26, 2020		Soil	M20-Au42747			X	X
30	V77	Aug 26, 2020		Soil	M20-Au42748			X	X
31	V78	Aug 24, 2020		Soil	M20-Au42749			X	X
32	V79	Aug 26, 2020		Soil	M20-Au42750			X	X
33	V80	Aug 26, 2020		Soil	M20-Au42751			X	X
34	V81	Aug 26, 2020		Soil	M20-Au42752			X	X
35	V84	Aug 26, 2020		Soil	M20-Au42753			X	X

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
36	QA01	Aug 24, 2020		Soil	M20-Au42754			X	X
37	QA03	Aug 26, 2020		Soil	M20-Au42755			X	X
38	QA05	Aug 26, 2020		Soil	M20-Au42756			X	X
39	RB	Aug 24, 2020		Water	M20-Au42757				X
40	RB	Aug 25, 2020		Water	M20-Au42758				X
41	RB	Aug 26, 2020		Water	M20-Au42759				X
42	TB	Aug 24, 2020		Water	M20-Au42760		X		
43	TB	Aug 25, 2020		Water	M20-Au42761		X		
44	TB	Aug 26, 2020		Water	M20-Au42762		X		
45	TP36_0.0	Aug 26, 2020		Soil	M20-Au42763	X			
46	TP36_0.5	Aug 26, 2020		Soil	M20-Au42764	X			
47	V31	Aug 25, 2020		Soil	M20-Au42765	X			
48	V32	Aug 25, 2020		Soil	M20-Au42766	X			

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Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
49	V33	Aug 25, 2020		Soil	M20-Au42767	X			
50	V34	Aug 25, 2020		Soil	M20-Au42768	X			
51	V35	Aug 25, 2020		Soil	M20-Au42769	X			
52	V36	Aug 25, 2020		Soil	M20-Au42770	X			
53	V37	Aug 25, 2020		Soil	M20-Au42771	X			
54	V38	Aug 25, 2020		Soil	M20-Au42772	X			
55	V39	Aug 25, 2020		Soil	M20-Au42773	X			
56	V40	Aug 25, 2020		Soil	M20-Au42774	X			
57	V41	Aug 25, 2020		Soil	M20-Au42775	X			
58	V42	Aug 25, 2020		Soil	M20-Au42776	X			
59	V43	Aug 25, 2020		Soil	M20-Au42777	X			
60	V44	Aug 25, 2020		Soil	M20-Au42778	X			
61	V45	Aug 25, 2020		Soil	M20-Au42779	X			

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
62	V46	Aug 25, 2020		Soil	M20-Au42780	X			
63	V47	Aug 25, 2020		Soil	M20-Au42781	X			
64	V48	Aug 25, 2020		Soil	M20-Au42782	X			
65	V49	Aug 25, 2020		Soil	M20-Au42783	X			
66	V50	Aug 25, 2020		Soil	M20-Au42784	X			
67	V51	Aug 25, 2020		Soil	M20-Au42785	X			
68	V52	Aug 25, 2020		Soil	M20-Au42786	X			
69	V53	Aug 25, 2020		Soil	M20-Au42787	X			
70	V54	Aug 25, 2020		Soil	M20-Au42788	X			
71	V55	Aug 25, 2020		Soil	M20-Au42789	X			
72	V56	Aug 25, 2020		Soil	M20-Au42790	X			
73	V58	Aug 26, 2020		Soil	M20-Au42791	X			
74	V59	Aug 26, 2020		Soil	M20-Au42792	X			

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Sample Detail						HOLD	BTEX	Moisture Set	Eurofins Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
75	V61	Aug 26, 2020		Soil	M20-Au42793	X			
76	V62	Aug 26, 2020		Soil	M20-Au42794	X			
77	V75	Aug 26, 2020		Soil	M20-Au42795	X			
78	V76	Aug 26, 2020		Soil	M20-Au42796	X			
79	V82	Aug 26, 2020		Soil	M20-Au42797	X			
80	V83	Aug 26, 2020		Soil	M20-Au42798	X			
Test Counts						36	3	38	41

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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.

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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	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	124			70-130	Pass	
TRH C10-C14	%	129			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	95			70-130	Pass	
Toluene	%	102			70-130	Pass	
Ethylbenzene	%	100			70-130	Pass	
m&p-Xylenes	%	103			70-130	Pass	
Xylenes - Total*	%	101			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	118			70-130	Pass	
TRH C6-C10	%	121			70-130	Pass	
TRH >C10-C16	%	124			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 C6-C9	M20-Au42720	CP	%	110			70-130	Pass	
TRH C10-C14	M20-Au42720	CP	%	97			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M20-Au42720	CP	%	95			70-130	Pass	
Toluene	M20-Au42720	CP	%	106			70-130	Pass	
Ethylbenzene	M20-Au42720	CP	%	103			70-130	Pass	
m&p-Xylenes	M20-Au42720	CP	%	104			70-130	Pass	
o-Xylene	M20-Au42720	CP	%	103			70-130	Pass	
Xylenes - Total*	M20-Au42720	CP	%	104			70-130	Pass	
Spike - % Recovery									

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Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M20-Au42720	CP	%	110			70-130	Pass	
TRH C6-C10	M20-Au42720	CP	%	109			70-130	Pass	
TRH >C10-C16	M20-Au42720	CP	%	93			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M20-Au42730	CP	%	110			70-130	Pass	
TRH C10-C14	M20-Au42730	CP	%	122			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M20-Au42730	CP	%	94			70-130	Pass	
Toluene	M20-Au42730	CP	%	101			70-130	Pass	
Ethylbenzene	M20-Au42730	CP	%	100			70-130	Pass	
m&p-Xylenes	M20-Au42730	CP	%	101			70-130	Pass	
o-Xylene	M20-Au42730	CP	%	100			70-130	Pass	
Xylenes - Total*	M20-Au42730	CP	%	101			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M20-Au42730	CP	%	108			70-130	Pass	
TRH C6-C10	M20-Au42730	CP	%	109			70-130	Pass	
TRH >C10-C16	M20-Au42730	CP	%	112			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M20-Au42740	CP	%	85			70-130	Pass	
TRH C10-C14	M20-Au42740	CP	%	128			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M20-Au42740	CP	%	75			70-130	Pass	
Toluene	M20-Au42740	CP	%	80			70-130	Pass	
Ethylbenzene	M20-Au42740	CP	%	82			70-130	Pass	
m&p-Xylenes	M20-Au42740	CP	%	83			70-130	Pass	
o-Xylene	M20-Au42740	CP	%	72			70-130	Pass	
Xylenes - Total*	M20-Au42740	CP	%	79			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M20-Au42740	CP	%	78			70-130	Pass	
TRH C6-C10	M20-Au42740	CP	%	86			70-130	Pass	
TRH >C10-C16	M20-Au42740	CP	%	123			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M20-Au42750	CP	%	106			70-130	Pass	
TRH C10-C14	M20-Au42750	CP	%	128			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M20-Au42750	CP	%	90			70-130	Pass	
Toluene	M20-Au42750	CP	%	99			70-130	Pass	
Ethylbenzene	M20-Au42750	CP	%	100			70-130	Pass	
m&p-Xylenes	M20-Au42750	CP	%	100			70-130	Pass	
o-Xylene	M20-Au42750	CP	%	99			70-130	Pass	
Xylenes - Total*	M20-Au42750	CP	%	100			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M20-Au42750	CP	%	109			70-130	Pass	
TRH C6-C10	M20-Au42750	CP	%	106			70-130	Pass	
TRH >C10-C16	M20-Au42750	CP	%	122			70-130	Pass	

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Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M20-Au42719	CP	mg/kg	2000	2100	2.0	30%	Pass	
TRH C15-C28	M20-Au42719	CP	mg/kg	6000	6200	3.0	30%	Pass	
TRH C29-C36	M20-Au42719	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M20-Au42719	CP	mg/kg	3700	3700	2.0	30%	Pass	
TRH >C16-C34	M20-Au42719	CP	mg/kg	4800	4200	4.0	30%	Pass	
TRH >C34-C40	M20-Au42719	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M20-Au42719	CP	%	11	10	4.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M20-Au42723	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M20-Au42723	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M20-Au42723	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M20-Au42723	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M20-Au42723	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M20-Au42723	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	M20-Au42723	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M20-Au42723	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M20-Au42723	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M20-Au42729	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M20-Au42729	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M20-Au42729	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M20-Au42729	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M20-Au42729	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M20-Au42729	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M20-Au42729	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M20-Au42729	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M20-Au42729	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	M20-Au42729	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M20-Au42729	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M20-Au42729	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M20-Au42729	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M20-Au42729	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M20-Au42729	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M20-Au42729	CP	%	7.2	7.2	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M20-Au42738	CP	mg/kg	< 20	< 20	<1	30%	Pass	

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Duplicate								
BTEX				Result 1	Result 2	RPD		
Benzene	M20-Au42738	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Toluene	M20-Au42738	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Ethylbenzene	M20-Au42738	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
m&p-Xylenes	M20-Au42738	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
o-Xylene	M20-Au42738	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Xylenes - Total*	M20-Au42738	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	M20-Au42738	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	M20-Au42738	CP	mg/kg	< 20	< 20	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C6-C9	M20-Au42739	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C10-C14	M20-Au42739	CP	mg/kg	67	71	6.0	30%	Pass
TRH C15-C28	M20-Au42739	CP	mg/kg	360	350	3.0	30%	Pass
TRH C29-C36	M20-Au42739	CP	mg/kg	< 50	< 50	<1	30%	Pass
Duplicate								
BTEX				Result 1	Result 2	RPD		
Benzene	M20-Au42739	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Toluene	M20-Au42739	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Ethylbenzene	M20-Au42739	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
m&p-Xylenes	M20-Au42739	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
o-Xylene	M20-Au42739	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Xylenes - Total*	M20-Au42739	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	M20-Au42739	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	M20-Au42739	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH >C10-C16	M20-Au42739	CP	mg/kg	150	150	3.0	30%	Pass
TRH >C16-C34	M20-Au42739	CP	mg/kg	280	270	4.0	30%	Pass
TRH >C34-C40	M20-Au42739	CP	mg/kg	< 100	< 100	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	M20-Au42739	CP	%	4.4	4.9	10	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C6-C9	M20-Au42747	CP	mg/kg	< 20	< 20	<1	30%	Pass
Duplicate								
BTEX				Result 1	Result 2	RPD		
Benzene	M20-Au42747	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Toluene	M20-Au42747	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Ethylbenzene	M20-Au42747	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
m&p-Xylenes	M20-Au42747	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
o-Xylene	M20-Au42747	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Xylenes - Total*	M20-Au42747	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	M20-Au42747	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	M20-Au42747	CP	mg/kg	< 20	< 20	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C6-C9	M20-Au42749	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C10-C14	M20-Au42749	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C15-C28	M20-Au42749	CP	mg/kg	< 50	< 50	<1	30%	Pass
TRH C29-C36	M20-Au42749	CP	mg/kg	< 50	< 50	<1	30%	Pass

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Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M20-Au42749	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M20-Au42749	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M20-Au42749	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M20-Au42749	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M20-Au42749	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	M20-Au42749	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M20-Au42749	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M20-Au42749	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M20-Au42749	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M20-Au42749	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M20-Au42749	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M20-Au42749	CP	%	10	11	7.0	30%	Pass	

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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
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.

Authorised By

Michael Morrison	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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Greencap NT P/L
11/14 Winnellie Road
Winnellie
NT 0800

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Stuart Carroll**

Report **740295-W**
Project name ONE RAIL-DSI/VALIDATION
Project ID J168829
Received Date Aug 27, 2020

Client Sample ID			RB	RB	RB	TB
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M20-Au42757	M20-Au42758	M20-Au42759	M20-Au42760
Date Sampled			Aug 24, 2020	Aug 25, 2020	Aug 26, 2020	Aug 24, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	-
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	-
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	-
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	-
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	-
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	82	85	86	89
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01	-
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	-
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	< 0.02	-
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	-
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	< 0.05	< 0.05	-
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	-
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	-
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	-

Client Sample ID			TB	TB
Sample Matrix			Water	Water
Eurofins Sample No.			M20-Au42761	M20-Au42762
Date Sampled			Aug 25, 2020	Aug 26, 2020
Test/Reference	LOR	Unit		
BTEX				
Benzene	0.001	mg/L	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001

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Client Sample ID			TB	TB
Sample Matrix			Water	Water
Eurofins Sample No.			M20-Au42761	M20-Au42762
Date Sampled			Aug 25, 2020	Aug 26, 2020
Test/Reference	LOR	Unit		
BTEX				
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	92	81

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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
Eurofins Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Aug 28, 2020	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Aug 28, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Aug 28, 2020	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Aug 28, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			

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IANZ # 1290

Company Name:	Greencap NT P/L	**Order No.:**	278070
Address:	11/14 Winnellie Road Winnellie NT 0800	**Report #:**	740295
		Phone:	61 8 8984 4244
		Fax:	61 8 8984 3105
Project Name:	ONE RAIL-DSI/VALIDATION		
Project ID:	J168829		

Received:	Aug 27, 2020 9:00 AM	
Due:	Aug 31, 2020	
Priority:	2 Day	
Contact Name:	Stuart Carroll	

Eurofins Analytical Services Manager : Michael Morrison

Sample Detail						HOLD	BTEX	Moisture Set	Eurofins Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
Newcastle Laboratory									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	TP35_1.05	Aug 24, 2020		Soil	M20-Au42719			X	X
2	TP36_1.0	Aug 26, 2020		Soil	M20-Au42720			X	X
3	TP36_1.5	Aug 26, 2020		Soil	M20-Au42721			X	X
4	TP37_1.6	Aug 26, 2020		Soil	M20-Au42722			X	X
5	V20	Aug 24, 2020		Soil	M20-Au42723			X	X
6	V21	Aug 24, 2020		Soil	M20-Au42724			X	X
7	V22	Aug 24, 2020		Soil	M20-Au42725			X	X
8	V23	Aug 24, 2020		Soil	M20-Au42726			X	X
9	V24	Aug 24, 2020		Soil	M20-Au42727			X	X

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Company Name:	Greencap NT P/L	**Order No.:**	278070	**Received:**	Aug 27, 2020 9:00 AM
Address:	11/14 Winnellie Road Winnellie NT 0800	**Report #:**	740295	**Due:**	Aug 31, 2020
		Phone:	61 8 8984 4244	**Priority:**	2 Day
		Fax:	61 8 8984 3105	**Contact Name:**	Stuart Carroll
Project Name:	ONE RAIL-DSI/VALIDATION				
Project ID:	J168829				

Eurofins Analytical Services Manager : Michael Morrison

Sample Detail						HOLD	BTEX	Moisture Set	Eurofins Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
10	V25	Aug 24, 2020		Soil	M20-Au42728			X	X
11	V26	Aug 24, 2020		Soil	M20-Au42729			X	X
12	V27	Aug 24, 2020		Soil	M20-Au42730			X	X
13	V28	Aug 24, 2020		Soil	M20-Au42731			X	X
14	V29	Aug 24, 2020		Soil	M20-Au42732			X	X
15	V30	Aug 24, 2020		Soil	M20-Au42733			X	X
16	V57	Aug 26, 2020		Soil	M20-Au42734			X	X
17	V60	Aug 26, 2020		Soil	M20-Au42735			X	X
18	V63	Aug 26, 2020		Soil	M20-Au42736			X	X
19	V64	Aug 26, 2020		Soil	M20-Au42737			X	X
20	V65	Aug 26, 2020		Soil	M20-Au42738			X	X
21	V66	Aug 26, 2020		Soil	M20-Au42739			X	X
22	V67	Aug 26, 2020		Soil	M20-Au42740			X	X

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Company Name: Greencap NT P/L
Address: 11/14 Winnellie Road
Winnellie
NT 0800

Project Name: ONE RAIL-DSI/VALIDATION
Project ID: J168829

Order No.: 278070
Report #: 740295
Phone: 61 8 8984 4244
Fax: 61 8 8984 3105

Received: Aug 27, 2020 9:00 AM
Due: Aug 31, 2020
Priority: 2 Day
Contact Name: Stuart Carroll

Eurofins Analytical Services Manager : Michael Morrison

Sample Detail						HOLD	BTEX	Moisture Set	Eurofins Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
23	V68	Aug 26, 2020		Soil	M20-Au42741			X	X
24	V69	Aug 26, 2020		Soil	M20-Au42742			X	X
25	V70	Aug 26, 2020		Soil	M20-Au42743			X	X
26	V71	Aug 26, 2020		Soil	M20-Au42744			X	X
27	V72	Aug 26, 2020		Soil	M20-Au42745			X	X
28	V73	Aug 26, 2020		Soil	M20-Au42746			X	X
29	V74	Aug 26, 2020		Soil	M20-Au42747			X	X
30	V77	Aug 26, 2020		Soil	M20-Au42748			X	X
31	V78	Aug 24, 2020		Soil	M20-Au42749			X	X
32	V79	Aug 26, 2020		Soil	M20-Au42750			X	X
33	V80	Aug 26, 2020		Soil	M20-Au42751			X	X
34	V81	Aug 26, 2020		Soil	M20-Au42752			X	X
35	V84	Aug 26, 2020		Soil	M20-Au42753			X	X

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Sydney Laboratory - NATA Site # 18217									
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Perth Laboratory - NATA Site # 23736									
36	QA01	Aug 24, 2020		Soil	M20-Au42754			X	X
37	QA03	Aug 26, 2020		Soil	M20-Au42755			X	X
38	QA05	Aug 26, 2020		Soil	M20-Au42756			X	X
39	RB	Aug 24, 2020		Water	M20-Au42757				X
40	RB	Aug 25, 2020		Water	M20-Au42758				X
41	RB	Aug 26, 2020		Water	M20-Au42759				X
42	TB	Aug 24, 2020		Water	M20-Au42760		X		
43	TB	Aug 25, 2020		Water	M20-Au42761		X		
44	TB	Aug 26, 2020		Water	M20-Au42762		X		
45	TP36_0.0	Aug 26, 2020		Soil	M20-Au42763	X			
46	TP36_0.5	Aug 26, 2020		Soil	M20-Au42764	X			
47	V31	Aug 25, 2020		Soil	M20-Au42765	X			
48	V32	Aug 25, 2020		Soil	M20-Au42766	X			

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Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
49	V33	Aug 25, 2020		Soil	M20-Au42767	X			
50	V34	Aug 25, 2020		Soil	M20-Au42768	X			
51	V35	Aug 25, 2020		Soil	M20-Au42769	X			
52	V36	Aug 25, 2020		Soil	M20-Au42770	X			
53	V37	Aug 25, 2020		Soil	M20-Au42771	X			
54	V38	Aug 25, 2020		Soil	M20-Au42772	X			
55	V39	Aug 25, 2020		Soil	M20-Au42773	X			
56	V40	Aug 25, 2020		Soil	M20-Au42774	X			
57	V41	Aug 25, 2020		Soil	M20-Au42775	X			
58	V42	Aug 25, 2020		Soil	M20-Au42776	X			
59	V43	Aug 25, 2020		Soil	M20-Au42777	X			
60	V44	Aug 25, 2020		Soil	M20-Au42778	X			
61	V45	Aug 25, 2020		Soil	M20-Au42779	X			

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Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
62	V46	Aug 25, 2020		Soil	M20-Au42780	X			
63	V47	Aug 25, 2020		Soil	M20-Au42781	X			
64	V48	Aug 25, 2020		Soil	M20-Au42782	X			
65	V49	Aug 25, 2020		Soil	M20-Au42783	X			
66	V50	Aug 25, 2020		Soil	M20-Au42784	X			
67	V51	Aug 25, 2020		Soil	M20-Au42785	X			
68	V52	Aug 25, 2020		Soil	M20-Au42786	X			
69	V53	Aug 25, 2020		Soil	M20-Au42787	X			
70	V54	Aug 25, 2020		Soil	M20-Au42788	X			
71	V55	Aug 25, 2020		Soil	M20-Au42789	X			
72	V56	Aug 25, 2020		Soil	M20-Au42790	X			
73	V58	Aug 26, 2020		Soil	M20-Au42791	X			
74	V59	Aug 26, 2020		Soil	M20-Au42792	X			

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Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
75	V61	Aug 26, 2020		Soil	M20-Au42793	X			
76	V62	Aug 26, 2020		Soil	M20-Au42794	X			
77	V75	Aug 26, 2020		Soil	M20-Au42795	X			
78	V76	Aug 26, 2020		Soil	M20-Au42796	X			
79	V82	Aug 26, 2020		Soil	M20-Au42797	X			
80	V83	Aug 26, 2020		Soil	M20-Au42798	X			
Test Counts						36	3	38	41

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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.

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Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	107			70-130	Pass	
TRH C10-C14	%	113			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	94			70-130	Pass	
Toluene	%	107			70-130	Pass	
Ethylbenzene	%	88			70-130	Pass	
m&p-Xylenes	%	98			70-130	Pass	
Xylenes - Total*	%	96			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	90			70-130	Pass	
TRH C6-C10	%	104			70-130	Pass	
TRH >C10-C16	%	112			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 C6-C9	M20-Au40855	NCP	%	97			70-130	Pass	
TRH C10-C14	M20-Au42372	NCP	%	74			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M20-Au40855	NCP	%	99			70-130	Pass	
Toluene	M20-Au40855	NCP	%	106			70-130	Pass	
Ethylbenzene	M20-Au40855	NCP	%	94			70-130	Pass	
m&p-Xylenes	M20-Au40855	NCP	%	94			70-130	Pass	
o-Xylene	M20-Au40855	NCP	%	92			70-130	Pass	
Xylenes - Total*	M20-Au40855	NCP	%	93			70-130	Pass	
Spike - % Recovery									

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Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M20-Au40855	NCP	%	109			70-130	Pass	
TRH C6-C10	M20-Au40855	NCP	%	95			70-130	Pass	
TRH >C10-C16	M20-Au42372	NCP	%	73			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M20-Au40817	NCP	mg/L	0.19	0.19	1.0	30%	Pass	
TRH C10-C14	M20-Au42371	NCP	mg/L	0.08	0.18	78	30%	Fail	Q15
TRH C15-C28	M20-Au42371	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M20-Au42371	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M20-Au40817	NCP	mg/L	0.013	0.012	1.0	30%	Pass	
Toluene	M20-Au40817	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M20-Au40817	NCP	mg/L	0.017	0.018	4.0	30%	Pass	
m&p-Xylenes	M20-Au40817	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M20-Au40817	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	M20-Au40817	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M20-Au40817	NCP	mg/L	0.07	0.07	7.0	30%	Pass	
TRH C6-C10	M20-Au40817	NCP	mg/L	0.29	0.29	1.0	30%	Pass	
TRH >C10-C16	M20-Au42371	NCP	mg/L	0.07	0.17	82	30%	Fail	Q15
TRH >C16-C34	M20-Au42371	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M20-Au42371	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

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

Authorised By

Michael Morrison	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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DRAFT

CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN | 50 005 085 521

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Brisbane Laboratory
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07 3902 4600 EnviroSampleQLD@eurofins.com

Perth Laboratory
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08 9251 9600 EnviroSampleWA@eurofins.com

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

Company	Greencap NT P/L
Address	11/14 Winnellie Road, Winnellie, NT, 0800
Contact Name	Stuart Carroll
Phone №	0466 776 038
Special Directions	
Purchase Order	278853
Quote ID №	

Project №	J168829
Project Name	One Rail - Diesel Spill Investigation
Project Manager	Stuart Carroll
EDD Format (EDD1, EDD2 etc)	
Sampler(s)	Staurt Carroll
Handed over by	Stuart Carroll
Email for Results	Stuart.Carroll@greencap.com.au

№			Matrix (Soil (S) Water (W))	Suite B1	BTEX	Containers (Change container type & size if necessary) 500mL Plastic - Unpreserved	500mL Plastic - Sodium Thiosulfate	60mL Plastic - Metals	200mL Amber Glass	40mL VOA Glass Vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)
1	V85	22/09/20	Soil	1								1	
2	V86	22/09/20	Soil	1								1	
3	V87	22/09/20	Soil	1								1	
4	V88	22/09/20	Soil	1								1	
5	V89	22/09/20	Soil	1								1	
6	V90	22/09/20	Soil	1								1	
7	V91	22/09/20	Soil	1								1	
8	V92	22/09/20	Soil	1								1	
9	V93	22/09/20	Soil	1								1	
10	V94	22/09/20	Soil	1								1	
11	V95	22/09/20	Soil	1								1	
12	V96	22/09/20	Soil	1								1	
13	V97	22/09/20	Soil	1								1	
14	V98	22/09/20	Soil	1								1	
15	V99	22/09/20	Soil	1								1	
16	V100	22/09/20	Soil	1								1	
17	V101	22/09/20	Soil	1								1	
18	V102	22/09/20	Soil	1								1	
19	V103	22/09/20	Soil	1								1	
20	V104	22/09/20	Soil	1								1	
21	V105	22/09/20	Soil	1								1	
22	V106	22/09/20	Soil	1								1	
23	V107	22/09/20	Soil	1								1	
24	V108	22/09/20	Soil	1								1	
25	V109	22/09/20	Soil	1								1	
26	V110	22/09/20	Soil	1								1	
27	V111	22/09/20	Soil	1								1	
28	V112	22/09/20	Soil	1								1	
29	V113	22/09/20	Soil	1								1	
30	V114	22/09/20	Soil	1								1	
31	V115	22/09/20	Soil	1								1	
32	QA07	22/09/20	Soil	1								1	
33	QA09	22/09/20	Soil	1								1	
34	TB01	22/09/20	Soil	1								1	
35	RB01	22/09/20	Blank		1				2				
		22/09/20	Blank	1				1				31	
Add new rows		Total Counts		31									

Required Turnaround Time (TAT)
Default will be 5 days if not ticked

*Surcharge will apply
- ☐ Overnight (reporting by 9am)*
- ☐ Same day*
- ☑ 1 day*
- ☐ 2 days*
- ☐ 3 days*
- ☐ 5 days (Standard)
- ☐ Other( )

Sample Comments / Dangerous Goods Hazard Warning

Method of Shipment: Courier (#) Hand Delivered Poster Name Signature Date Time

Eurofins | mgt Laboratory Use Only

Received By: Ashvin Desai SYD | BNE | MEL | PER | ADL | NTL | DRW Signature Date 23/09/20 Time 10:50AM Temperature 16.1C

Received By: SYD | BNE | MEL | PER | ADL | NTL | DRW Signature Date Time Report № 745838

DRAFT

Unless all samples for this laboratory will be received as occurrence 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

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IANZ # 1290

Sample Receipt Advice

Company name:	Greencap NT P/L
Contact name:	Stuart Carroll
Project name:	ONE RAIL - DIESEL SPILL INVESTIGATION
Project ID:	J168829
Turnaround time:	1 Day
Date/Time received	Sep 23, 2020 10:50 AM
Eurofins reference	745838

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.
- X Split sample sent to requested external lab.
- X Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

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Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Michael Morrison on phone : 03 8564 5933 or by email: MichaelMorrison@eurofins.com

Results will be delivered electronically via email to Stuart Carroll - stuart.carroll@greencap.com.au.

Note: A copy of these results will also be delivered to the general Greencap NT P/L email address.

Greencap NT P/L
11/14 Winnellie Road
Winnellie
NT 0800

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Stuart Carroll**

Report **745838-S**
Project name ONE RAIL - DIESEL SPILL INVESTIGATION
Project ID J168829
Received Date Sep 23, 2020

Client Sample ID			**V85**	**V86**	**V87**	**V88**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M20-Se38633**	**M20-Se38634**	**M20-Se38635**	**M20-Se38636**
Date Sampled			**Sep 22, 2020**	**Sep 22, 2020**	**Sep 22, 2020**	**Sep 22, 2020**
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	130	400	< 20	< 20
TRH C15-C28	50	mg/kg	580	1000	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	710	1400	< 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	%	118	101	123	116
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	340	820	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	340	820	< 50	< 50
TRH >C16-C34	100	mg/kg	420	680	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	760	1500	< 100	< 100
% Moisture	1	%	11	12	11	12

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Client Sample ID			V89	V90	V91	V92
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Se38637	M20-Se38638	M20-Se38639	M20-Se38640
Date Sampled			Sep 22, 2020	Sep 22, 2020	Sep 22, 2020	Sep 22, 2020
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	400	110	< 20	< 20
TRH C15-C28	50	mg/kg	1700	430	< 50	73
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	2100	540	< 50	73
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	%	101	143	int	81
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	1000	270	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	1000	270	< 50	< 50
TRH >C16-C34	100	mg/kg	1200	300	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	2200	570	< 100	< 100
% Moisture	1	%	13	15	6.1	10

Client Sample ID			V93	V94	V95	V96
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M20-Se38641	M20-Se38642	M20-Se38643	M20-Se38644
Date Sampled			Sep 22, 2020	Sep 22, 2020	Sep 22, 2020	Sep 22, 2020
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-C36 (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	%	58	108	99	58

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