



## **Baseline Due Diligence Environmental Site Assessment**

**Part 32, 33 and Part 34 South Wharf, Port Melbourne**

Prepared for:

Port of Melbourne Operations Pty Ltd and Cement Australia Holdings Pty Ltd  
Level 19, 839 Collins Street  
Docklands, VIC 3008

18 December 2019





## Distribution

### Baseline Due Diligence Environmental Site Assessment, Part 32, 33 and Part 34 South Wharf, Port Melbourne

18 December 2019

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#### Senversa Pty Ltd

ABN: 89 132 231 380

Level 6, 15 William Street, Melbourne, VIC 3000

tel: + 61 3 9606 0070; fax: + 61 3 9606 0074

[www.senversa.com.au](http://www.senversa.com.au)

Project  
Manager

**Lucinda Trickey**  
Senior Environmental Engineer

Project  
Director

**Briony Muller**  
Senior Associate

Technical  
Peer  
Review

**Richard Griffin**  
Principal



## Executive Summary

Senversa Pty Ltd (Senversa) was engaged by Port of Melbourne Operations Pty Ltd (PoM) to undertake a baseline due diligence environmental site assessment for Part 32, 33 and Part 34 South Wharf, Lorimer Street, Port Melbourne (the site). At the time of the assessment, Part of 32 and 33 South Wharf were being used for the bulk storage and transport of cement products. Part 34 appeared to be vacant and unused, except for a small portion in the east serving as wharf access and carparking. The site is largely sealed except for a small grassed area of Part 34.

The objective of the works is to document the baseline conditions of soil and groundwater at the site prior to commencement of a new lease.

Soil investigation works undertaken across the site identified fill soils up to 2.0 m thick, underlain by natural Port Melbourne Sand. The shallow fill soils were impacted by low-level metal, total recoverable hydrocarbon and polycyclic aromatic hydrocarbon concentrations; with widespread nickel, zinc and isolated copper and benzo(a)pyrene concentrations above the adopted maintenance of ecosystems criteria. All analysed samples contained chemical concentrations below the human health objectives for commercial land use.

Groundwater investigation works from existing monitoring wells showed that groundwater was present approximately 1.5 to 2.5 m below ground level, with an inferred flow direction towards the Yarra River. The groundwater contained elevated levels of ammonia, sulphate, metals and total recoverable hydrocarbon exceeding the adopted beneficial uses. These concentrations are consistent with regional groundwater quality in the port region.

Based on the results of the due diligence environmental site assessment, the site is considered suitable for ongoing use in a commercial/ industrial, port-related setting.



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## List of Acronyms

Acronym	Description	Acronym	Description
<b>ACM</b>	Asbestos containing material	<b>NEPC</b>	National Environment Protection Council
<b>AHD</b>	Australian Height Datum	<b>NEPM</b>	National Environment Protection Measure
<b>ALS</b>	Australian Laboratory Services	<b>NHMRC</b>	National Health and Medical Research Council
<b>AS</b>	Australian Standard	<b>PAH</b>	Polycyclic aromatic hydrocarbons
<b>AST</b>	Above ground storage tank	<b>PCR</b>	Primary contact recreation
<b>ANZECC</b>	Australian and New Zealand Environment and Conservation Council	<b>PID</b>	Photo-ionisation detector
<b>bgl</b>	Below ground level	<b>PoM</b>	Port of Melbourne Operations
<b>BTEX</b>	Benzene, toluene, ethylbenzene, xylenes	<b>PVC</b>	Polyvinyl chloride
<b>CIS</b>	Coode Island Silt	<b>PZ</b>	Port Zone
<b>COC</b>	Chain of custody	<b>QA</b>	Quality assurance
<b>CoPC</b>	Contaminant of potential concern	<b>QC</b>	Quality control
<b>DO</b>	Dissolved oxygen	<b>RPD</b>	Relative percentage difference
<b>EC</b>	Electrical conductivity	<b>SB</b>	Soil bore
<b>EIL</b>	Ecologically based investigation level	<b>SEPP</b>	State Environment Protection Policy
<b>EPA</b>	Environment Protection Authority (Victoria)	<b>SEPP PMCL</b>	State Environment Protection Policy (Prevention and Management of Contaminated Land)
<b>ESA</b>	Environmental Site Assessment	<b>SEPP WoV</b>	State Environment Protection Policy (Waters of Victoria)
<b>ESL</b>	Ecological screening level	<b>SWL</b>	Standing water level
<b>GQRUZ</b>	Groundwater quality restricted use zone	<b>TDS</b>	Total dissolved solids
<b>GME</b>	Groundwater monitoring event	<b>TPH</b>	Total petroleum hydrocarbons
<b>HSL</b>	Health screening level	<b>TRH</b>	Total recoverable petroleum hydrocarbons
<b>HSEP</b>	Health and Safety Plan	<b>USEPA</b>	United States Environment Protection Agency
<b>LNAPL</b>	Light non-aqueous phase liquid	<b>USD</b>	Underground Service Detection
<b>LOR</b>	Limit of reporting	<b>VOC</b>	Volatile Organic Compound
<b>m AHD</b>	Metres Australian Height Datum		
<b>MoE</b>	Maintenance of Ecosystems		
<b>MW</b>	Monitoring well		
<b>NATA</b>	National Association of Testing Authorities		



## 1.0 Introduction

### 1.1 Background

Senversa Pty Ltd (Senversa) was engaged by Port of Melbourne Operations Pty Ltd (PoM) to undertake a baseline due diligence environmental site assessment (ESA) for Part 32, 33 and Part 34 South Wharf, Lorimer Street, Port Melbourne (the site). The site boundary is presented on **Figure 1**.

At the time of the assessment, Part of 32 and 33 South Wharf were being used for the bulk storage and transport of cement products. Part 34 appeared to be vacant and unused, except for a small portion in the east serving as wharf access and carparking. It is understood that Cement Australia Holdings Pty Ltd are the incoming tenants for the site.

### 1.2 Objectives

The objective of the works is to document the baseline conditions of soil and groundwater at the site prior to commencement of a new lease.

### 1.3 Scope of Works Undertaken

Senversa completed the following scope of works:

- A site inspection to document the site condition at the time of the assessment.
- Summary of local and regional geology and hydrogeology, using a combination of published data sources and previous site investigation findings.
- Summary of site history based on information from historical environmental reports and other historical resources.
- Preparation of a Health, Safety and Environment Management Plan (HSEP).
- Clearance of underground services for each investigation location.
- Completion of PoM's ground penetration works notification and permit process.
- A soil investigation involving concrete coring, non-destructive drilling (NDD), logging and sampling of 10 soil bores up to 2.2 m below ground level (bgl).
- A groundwater investigation involving the gauging and sampling of seven existing groundwater monitoring wells both on and surrounding the site.
- Laboratory analysis of selected soil and groundwater samples for contaminants of potential concern (CoPC) by laboratories accredited by National Association of Testing Authorities Australia (NATA) for the analysis methods used.
- Collation and interpretation of the data, including conducting a quality assurance / quality control (QA/QC) data validation process.
- Interpretation of available historical data (ESG, 2016 and BlueSphere, 2016) for Part 32 South Wharf in the absence of current investigation results.
- Completion of this report including assessment of the contamination status of soil and groundwater at the site in the context of a commercial / industrial port-related setting.



## 2.0 Background Information

This section summarises the site environmental setting, site history and potential sources of contaminants of concern. Historical assessment reports used to compile the background information included the following:

- Peter J Ramsay & Associates (2000). Contamination Assessment of Land, 34 South Wharf, Port Melbourne, Victoria. Issued November 2000.
- Meinhardt (2005a). Baseline Environmental Site Assessment, Site U56, Steel Cement, South Wharf, Port Melbourne. Issued May 2005.
- Meinhardt (2005b). Baseline Environmental Site Assessment, Site U57 Pozzolan Industries, Port Melbourne, South Wharf, Port Melbourne. Issued May 2005.
- Meinhardt (2005c). Baseline Environmental Site Assessment, Site U16, South Wharf, Port Melbourne. Issued May 2005.
- Golder Associates (2008). 33 South Wharf – Updated Site Environmental Assessment. Issued September 2008. Issued September 2008.
- BlueSphere Environmental (2012). Current Site Status Review 32 – 34 South Wharf. Issued November 2012.
- BlueSphere Environmental (2016). Supplementary Environmental Site Assessment, 32 – 33 South Wharf. Issued November 2016.

### 2.1 Site Details

The following table summarises the relevant details that describe the site.

**Table 2-1: Site Details**

Item	Relevant Site Information
<b>Site Location</b>	33, 32 and 34 South Wharf, Lorimer Street, Port Melbourne
<b>Site Area</b>	Approximately 2.3 ha
<b>Site Owner</b>	Port of Melbourne Operations Pty Ltd
<b>Site Occupiers</b>	Pozzolan Industries Pty Ltd (33), Hy-Tec Concrete and Aggregates (Part 32), Vacant PoM land (Part 34)
<b>Current Land Use Zoning</b>	Port Zone (PZ) Aboriginal Cultural Heritage Sensitivity Overlay
<b>Municipality</b>	City of Melbourne
<b>Topography</b>	The site is generally flat, elevated approximately 2 to 4 m above Australian Height Datum (AHD).
<b>Nearest Surface Water Bodies</b>	Yarra River lies adjacent to the north of the site (see <b>Figure 1</b> ).



Item	Relevant Site Information
<b>Surrounding Land Use</b>	<ul style="list-style-type: none"> <li>• <b>North:</b> Yarra River adjacent to northern site boundary, further north are port related facilities.</li> <li>• <b>South:</b> Commercial and industrial precincts including Calendar Cheese Company, OPG Global Solutions, Press Print Solutions, as well as other logistics and storage related facilities.</li> <li>• <b>East:</b> Various storage warehouses for port related activities.</li> <li>• <b>West:</b> Port of Melbourne Education Centre, restaurants and a wine distribution facility.</li> </ul>
<b>EPA Priority Sites Register</b>	<p>A review of the EPA Priority Sites Register (PSR) on 18 November 2019 indicated that no Clean Up or Pollution Abatement Notices (relevant to land and/or groundwater contamination) had been issued to the owner or occupier of the site, nor for properties within 500 m of the site as of 30 September 2019.</p>
<b>Groundwater Quality Restricted Use Zones</b>	<p>A review of Visualising Victoria's Groundwater indicates that no groundwater quality restricted use zones (GQRUZ) have been declared for the site, nor for properties within 500 m of the site.</p>

## 2.2 Current Site Use

The sections below described the current use of Part 32, 33, and Part 34 areas at the time of the assessment. Site photographs are provided in **Appendix A**.

### 2.2.1 Part 34

At the time of the assessment, Part 34 comprised vacant unused land except for the far east portion of the site that serves as Wharf access and carparking. This area was unsealed with a grass surface, except for along the eastern boundary where an asphalt road allows access to the wharf via an electric remotely operated gate with an adjacent gatehouse building. On the north side of the gate was the asphalt covered wharf area (see Photographs 27 to 28).

### 2.2.2 33

33 was occupied by Pozzolanic Enterprises Pty Ltd for storage mixing and batching of cement products. The site comprised a mixture of concrete, asphalt and paving hardstand. Notable site features included:

- A large disused fly ash bulk storage tank in the centre of the site (Photograph 1).
- Fly ash and dry cement silos with truck loading facilities (Photograph 1 and 6).
- Oil water storage area in the eastern portion of the site. The area was not bunded however no signs of leakage were observed (photograph 5).
- Former above ground storage tank (AST) believed to have contained water (Photograph 4).
- A workshop containing small amounts of lubricants and oils. The workshop floor consisted of concrete hardstand in moderate condition with a small patch of unsealed surface in the truck maintenance area (Photograph 2) Interviews with site personal indicated that the workshop is predominantly used for storage purposes and minor truck servicing (Photograph 2 and 3).
- Site office and amenities.



### 2.2.3 Part 32

Part 32 is occupied by Hy-tec for use as a concrete batching plant. An office building, truck parking, cement truck watering bays and above ground storage tanks (ASTs), which appeared to be associated with cement and/or concrete mixing and batching (Photographs 23 to 26) are present on site.

## 2.3 Site History Summary

Development of the South Wharf Precinct commenced in the late 1900s with relocation of the Melbourne Harbour Trust timber stores and wharves from their inner-city location to the western end of the precinct.

Review of historical aerial photography showed that the site was undeveloped prior to 1940. By the 1960s, 32 and 33 South Wharf had been developed into a shipping freight loading and storage facility for handling of live exports (sheep) and potential storage of coal. Part 34 South Wharf appeared to have remained vacant and while small buildings and machinery had been identified in historic aerials at various times there was no evidence of permanent industrial land use.

Steel Cement and Pozzolanic Enterprises Pty Ltd occupied 32-33 South Wharf from the early 1990s and this portion of site was used for the unloading, stockpiling and processing of blast furnace slag, a by-product from the production of steel. The slag was ground on-site and mixed with gypsum to later be added to cement.

Various contaminated land assessment reports were also completed for the site between 2000 and 2016 (Peter J Ramsay & Associates, 2000, Meinhardt, 2005a, 2005b, 2005c, Golder, 2008, BlueSphere 2016). These assessments comprised various soil and groundwater investigation works that identified:

- Fill soil was present across the entire site in depths ranging from 0.8 m bgl to 1.6 m bgl. Fill soils comprised sandy gravel and sand with anthropogenic material including coke and ash.
- Concentrations of heavy metals exceeding the adopted ecological guidelines were found in fill soil across the site. TRH concentrations exceeding the adopted criteria<sup>1</sup> was also found in fill soil in the maintenance area on 33 South Wharf.
- Depth to groundwater at the site ranged from 1.7 m bgl to 2.6 m bgl with an inferred flow towards the north east in the direction of the Yarra River. Concentrations of ammonia and heavy metals in groundwater exceed the adopted assessment criteria. Volatile organic compounds below relevant guidelines were detected in groundwater in the western portion of 33 South Wharf.

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<sup>1</sup> The adopted criteria were sourced from *Guidelines for Assessing Service Station Sites* (NSW EPA 1994) which were developed for sensitive land use and have since been superseded by less conservative criteria.



## 2.4 Sources of Contaminants of Potential Concern

Based on the results of previous investigations, the collated site history information and inspection of the site, the identified potential areas of contamination and CoPC are summarised in the table on the following page.

**Table 2-2: Sources of Contaminants of Potential Concern**

Potential Source of Contamination	Contaminants of Potential Concern
Legacy / precinct wide contamination issues, including historical fill deposition from unknown sources and previous land use activities.	<ul style="list-style-type: none"> <li>• Heavy Metals/ Metalloids (Arsenic, Cadmium, Chromium, Copper, Mercury, Nickel, Lead and Zinc).</li> <li>• Polycyclic Aromatic Hydrocarbons (PAHs).</li> <li>• Petroleum Hydrocarbons (TRHs).</li> <li>• Volatile organic compounds (VOCs).</li> <li>• Sulphate and ammonia.</li> <li>• Asbestos containing materials (ACM).</li> </ul>
Cement and fly ash storage batching and processing activities	<ul style="list-style-type: none"> <li>• Heavy Metals/ Metalloids, sulphur compounds, pH</li> </ul>
Workshops and oil storage	<ul style="list-style-type: none"> <li>• Polycyclic Aromatic Hydrocarbons (PAHs).</li> <li>• Petroleum Hydrocarbons (TRHs).</li> <li>• BTEXN (benzene, toluene, ethylbenzene, xylene and naphthalene).</li> </ul>
Vehicle parking, vehicle movement across the site.	<ul style="list-style-type: none"> <li>• Petroleum hydrocarbons (TRHs).</li> <li>• BTEXN (benzene, toluene, ethylbenzene, xylene and naphthalene).</li> </ul>

The investigation methodology implemented based on these CoPC is discussed in **Section 3.0**, while the laboratory analysis is detailed in **Section 3.4**.



## 3.0 Assessment Methodology

The following sections describe the guidelines, standards and investigation methods adopted and used during the due diligence ESA.

### 3.1 Relevant Guidelines and Standards

The investigation has been performed in accordance with the following guidelines and standards:

- EPA Victoria, Hydrogeological Assessment (Groundwater Quality) Guidelines, Publication 668, September 2006.
- EPA Victoria, *Groundwater Sampling Guidelines*, Publication 669, April 2000.
- National Environment Protection Council (NEPC). National Environment Protection (Assessment of Site Contamination) Measure (NEPM), 2013.
- Standards Australia, Australian Standard (AS 4482.1) - Guide to the Sampling and Investigation of Potentially Contaminated Soil, Part 2: Non-volatile and Semi-volatile compounds, 2005.
- Standards Australia, Australian Standard (AS 4482.2) - Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil, Part 1: Volatile Substances, 1999.
- State Environment Protection Policy (SEPP), Waters, (SEPP (Waters)) (State of Victoria, 2018).
- SEPP, Prevention and Management of Contamination of Land, (SEPP (PMCL)) (State of Victoria, 2002).

### 3.2 Assessment Rationale

As discussed in **Section 1.0**, the site investigation works completed as part of this end of lease ESA comprised:

- Soil sampling and analysis from ten soil bores (SB7375 – SB7384).
- Groundwater gauging, sampling and analysis from seven existing groundwater monitoring wells (MW7015, MW7016, MW7018, MW7019, MW7020, MW7021 and MW7075).

The rationale behind the investigation locations was to provide general coverage of the site. Soil bores that historically targeted areas of potential concern including the drum storage and maintenance workshop (33 South Wharf) were not reassessed due to the presence of existing groundwater wells. Sampling and comparison of the groundwater in these areas was considered sufficient to assess the condition of the site.

In addition, data from five recent soil investigation locations at 32 South Wharf (ESG, 2016 and BlueSphere, 2016) were also incorporated with the assessment results, including BH01 – BH04 (ESG, 2016) and SB7326 (BlueSphere, 2016) (refer to **Figure 2**). These investigation works were recently completed in 2016 and were deemed to be representative of prelease baseline conditions.



### 3.3 Investigation Program

The table below summarises the methodology specific to the field program.

**Table 3-1: Investigation Methodology**

Activity	Item	Description
Groundwater Gauging	Dates	9 October 2019
	Method	<p>Prior to sampling, groundwater standing water levels (SWLs) were measured relative to the top of the polyvinyl chloride (PVC) casing from marks indicating the point surveyed. The oil / water interface meter was decontaminated prior to and after each measurement with a Decon 90 and clean water solution.</p> <p>In addition, the total depth of all wells and condition of the wells were recorded. Groundwater gauging results are summarised in <b>Table 1</b>.</p>
	Accuracy	Recorded to nearest 0.001 m with an estimated accuracy of $\pm 0.002$ m.
Groundwater Sampling	Dates	9 and 10 October 2019
	Method	<p>A total of seven existing groundwater monitoring wells were sampled during the GME. The general methodology is summarised below:</p> <ul style="list-style-type: none"> <li>• Low-flow sampling method was utilised during this GME in general accordance with EPA Publication 668 and 669.</li> <li>• Low flow sampling was undertaken with a Geocontrol® unit and bladder pump, where the pump inlet was placed within the screen interval.</li> <li>• Field groundwater quality parameters were measured using a water quality meter and a flow-through cell. The parameters included pH, electrical conductivity (EC), dissolved oxygen (DO), oxidation-reduction potential (redox) and temperature.</li> <li>• Sampling of the wells occurred once water level drawdown and water quality parameters had stabilised within the adopted acceptable ranges, which are in accordance with EPA Publication 669. Water table drawdown was monitored during purging and at the completion of sampling, using an interface meter. A summary of the parameter stabilisation is included in <b>Table 2</b>.</li> <li>• Where water level drawdown was not able to be stabilised within the adopted acceptable range, wells were either purged dry or three bore volumes were removed. This included wells MW7015, MW701 and MW7075.</li> <li>• Groundwater samples that were analysed for dissolved metals were field filtered with 0.45 micron disposable filters.</li> </ul> <p>Refer to purging sheet in <b>Appendix B</b> for details of the purging and sampling.</p>
	Equipment Calibration	The YSI ProPlus water quality meter and the interface meter were calibrated by the equipment supplier prior to use. Copies of the calibration certificates have been included in <b>Appendix C</b> .



Activity	Item	Description
<b>Service Clearance</b>	Date	9 October 2019 and 19 November 2019
	Contractor	Underground Services Detection (USD) and Qest Underground Services (Qest)
		<p>Prior to intrusive site works, proposed investigation locations were cleared for the presence of underground services via the following methodology:</p> <ul style="list-style-type: none"> <li>• Review of available service and sewerage plans from the dial-before-you-dig online database.</li> <li>• Inspection of the site and immediate off-site areas for surface evidence and signage indicating utility locations and to confirm the presence and alignment of nearby and on-site sewerage infrastructure and underground services.</li> <li>• Tracing of known and redundant (where possible) underground utilities by an experienced underground utility locator using radio detection equipment. Senversa supervised this activity and discussed the findings with the locator personnel.</li> </ul> <p>Completion of Senversa's Borehole / Excavation Underground and Overhead Clearance Protocol prior to intrusive investigation.</p>
<b>Soil Sampling – Drilling Works</b>	Dates	9 – 10 October 2019 and 19 November 2019
	Contractor	USD and Qest
	Methods	<p>Ten soil bores (SB7375 – SB7384) were drilled to between 2.0 m bgl and 2.2 m bgl, using concrete coring and non-destructive digging techniques (NDD) which included either a high-pressured water lance or hand auger. Samples were collected by retrieving directly from the hand auger head. The hand auger was decontaminated between each sample collected and between each soil bore location.</p> <p>Soil samples were collected from immediately below the asphalt, and at approximately 0.5 m intervals thereafter.</p> <p>Photographs of the lithology encountered, and samples collected is provided within <b>Appendix A</b>. The stratigraphy encountered during drilling works are detailed on the lithological logs presented in <b>Appendix D</b> and is summarised in <b>Section 4.1.1</b>.</p>
Equipment Calibration Records	A photoionisation detector (PID) was used to screen sub-samples and ambient air during the drilling for VOCs. PID measurements are presented on the lithological logs ( <b>Appendix D</b> ) The meter was calibrated by the supplier prior to use. Relevant calibration certificates have been provided in <b>Appendix C</b> .	
<b>Sample Handling and Preservation</b>	Method	All environmental samples were placed into clean laboratory-supplied jars or appropriately preserved bottles. Samples were collected immediately and stored on ice prior to and during transport to the laboratory to minimise sample degradation and the loss of volatile contaminants. Chain of custody forms were completed for each sample batch and then transported for analysis to NATA accredited laboratories. Copies of the chain of custody forms are provided in <b>Appendix E</b> .
<b>Waste Disposal</b>	Method	Wastewater from purging and sampling of groundwater monitoring wells was temporarily stored in a 205 L drum on site, which was subsequently transported off-site to a licensed facility for disposal. Excess soil spoil and water from NDD was collected within subcontractors' dedicated vehicles and was subsequently transported under licence from EPA off-site for disposal. Waste Transport Certificates are provided within <b>Appendix F</b> .
<b>Avoidance of Cross Contamination</b>	Method	<p>Sampling procedures used to prevent cross contamination involved:</p> <ul style="list-style-type: none"> <li>• Decontamination of the hand auger, micro purge pump and interface probe between sampling locations, using a Decon® 90 and water solution and a separate vessel of clean water for a final rinse.</li> </ul> <p>The use of new disposable gloves, zip-lock bags for VOC measurements, bladders, field filters and low-density polyethylene tubing at each location.</p>



### 3.4 Laboratory Analysis

The primary laboratory used for conducting the soil analysis was Eurofins and Australian Laboratory Services (ALS) were engaged as the secondary laboratory for the soil analysis.

ALS were engaged as the primary laboratory for the groundwater analysis and Eurofins were engaged as the secondary laboratory. The laboratory certificates of analysis are provided in **Appendix E**.

The analysis selected was based on the CoPCs (**Section 2.5**) and was not focused on legacy contamination issues that have previously been identified and considered not to impact on the suitability of the site use in a commercial/industrial setting.

**Table 3-2: Laboratory Analysis**

Matrix	Analytes
<b>Soil</b>	<p>Analysis of twelve fill samples and eight natural samples for the following:</p> <ul style="list-style-type: none"> <li>Metals/Metalloids (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg), total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAH), benzene, toluene, ethylbenzene, xylene, naphthalene (BTEXN), sulphate.</li> </ul> <p>QC Samples:</p> <ul style="list-style-type: none"> <li>Two field and two secondary duplicates for metals/metalloids (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg), TRH, PAH, BTEXN.</li> <li>Two rinsate samples for metals/metalloids (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg), TRH, PAH, BTEXN, sulphate.</li> </ul>
<b>Groundwater</b>	<p>Analysis of seven groundwater samples:</p> <ul style="list-style-type: none"> <li>Metals/Metalloids (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg), TRH, PAH, BTEXN, sulphate, ammonia, total dissolved solids (TDS).</li> </ul> <p>QC Samples:</p> <ul style="list-style-type: none"> <li>One field and one secondary duplicate for metals/metalloids (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg), TRH, PAH, BTEXN, sulphate, ammonia and TDS.</li> <li>One trip blank sample for TRH C<sub>6</sub>-C<sub>9</sub> and BTEXN.</li> <li>Two rinsate sample for metals/metalloids (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg), TRH, PAH, BTEXN, sulphate, ammonia and TDS.</li> </ul>

### 3.5 Quality Assurance / Quality Control

The QA/QC procedures adopted by Senversa provide a consistent approach to evaluation of whether the data quality objectives required by the project have been achieved. The process focuses on assessment of the useability of the data in terms of accuracy and reliability in forming conclusions on the condition of the element of the environment being investigated.

Based on the results of the data validation, the data is considered suitable for use in forming conclusions relating to the contamination status of the site. Further discussion on the data validity is included in **Appendix G**.

Senversa did not undertake a detailed review of the QA/QC procedures adopted by ESG (2016) and BlueSphere (2016) for historic investigations undertaken at 32 South Wharf. An assumption has been made that the data obtained from these investigations is reliable and representative.

### 3.6 Adopted Investigation Levels

The rationale for adopting assessment guidelines for the current assessment and the framework under which contamination of land and groundwater is assessed and managed in Victoria, is provided in **Appendix H**.



## 4.0 Assessment Results

### 4.1 Field Observations

#### 4.1.1 Soil

The generalised soil profile is presented below. A more detailed description of the soil profile is provided in the soil logs included in **Appendix D**.

**Table 4-1: Soil Profile**

Approximate Depths (m bgl)	Stratigraphy	Site-Specific Lithology Description / Comments
0.0 to 0.05	-	<b>Sealed Hardstand:</b> Asphalt (locations within 33 South Wharf only).
0.0 to .0	Fill	<b>FILL:</b> Sandy GRAVEL/ Gravelly SILT/ Silty SAND/ Gravelly CLAY, fine to coarse grained sand and fine to coarse grained gravels, grey to brown. Anthropogenic material observed in the west of site included brick and concrete. <b>FILL:</b> SAND, fine to medium grained sand, occasional trace clay, yellow to dark grey, very loose. Very dense sands observed at north western section of the site.
0.4 to 2.2	Natural (Port Melbourne Sands)	<b>SAND:</b> Fine to medium grained sand, grey to yellow grey, brown and orange, loose, <b>Silty SAND:</b> fine grained sand, trace clay, grey to pale grey.

No odours or staining were sighted during the soil investigation works. Field measured VOC concentrations across all samples were less than 1 ppm.

#### 4.1.2 Groundwater

A summary of the measured groundwater levels is provided in **Table 1** and presented on **Figure 3**. Groundwater contours have not been included on **Figure 3** due to the poor well condition and tidal influences during the period of gauging. Results from the gauging event are as follows:

- No light non-aqueous phase liquid (LNAPL) was detected in on-site wells. This is consistent with historical groundwater monitoring events.
- MW7017 could not be sampled as the well was blocked at 1.62m above the inferred water table. MW7015 and MW7019 experienced blockage, which reduced the amount of available water within the water column of the well.
- A naturally occurring organic odour (sulphur) was noted during the purging at monitoring well MW7019.
- Standing water levels ranged from 1.58 m below top of casing (BTOC) (MW7015) to 2.56 m BTOC (MW7021).
- The reduced water levels ranged from 0.093 m AHD (MW7019) to 0.612 m AHD (MW7075).
- Gauging occurred on the rising mid-tide. At the time of the gauging event, the reduced groundwater levels indicated a general groundwater flow direction to the north east towards the Yarra River consistent with previous monitoring results.



### 4.1.3 Groundwater Observations and Field Chemistry

Groundwater parameters measured in the field are provided in **Table 2**. Key findings are provided below:

- pH ranged from 5.34 (MW7018) to 6.64 (MW7065), indicating slightly acidic to neutral groundwater conditions across the site.
- Field TDS ranged from 867 mg/L (MW7016) to 16,137 mg/L (MW7018). The TDS range is within historical and regional ranges.
- Redox potential ranged from 108.7 mV (MW7020) to 215 mV (MW7018). The groundwater environment is considered slightly oxidising.
- The groundwater temperature ranged from 14.5 °C (MW7075) and 18.1 °C (MW7016 / MW7021).

## 4.1 Laboratory Results

Soil and groundwater analytical results compared to the adopted screening levels and guidelines are presented in **Table 3** and **Table 4** respectively. Laboratory certificates of analysis are provided in **Appendix E**.

## 4.2 Nature and Extent of Contamination

### 4.2.1 Soil

All concentrations of chemical analytes in analysed soil samples were below the adopted assessment criteria, with the exception of the following above the adopted ecological investigation levels:

- Nickel in shallow fill samples analysed from 32 and 33 South Wharf, ranging in concentrations from 71 mg/kg to 200 mg/kg.
- Copper in one fill sample collected from 32 South Wharf (170 mg/kg).
- Zinc in shallow fill samples analysed from 34 South Wharf, ranging in concentrations from 169 mg/kg to 630 mg/kg.
- Benzo(a)pyrene in one shallow fill samples analysed from 34 South Wharf (15 mg/kg).

In the absence of identified site sources, these contaminants are representative of sporadic impacts in the heterogeneous fill and not site derived.

### 4.2.2 Groundwater

Exceedances of adopted assessment criteria were reported broadly across the well network for TDS, ammonia (as N), sulphate (as SO<sub>4</sub>) and metals (arsenic, copper, nickel and zinc). In addition, one location (MW7019) reported exceedances of adopted assessment criteria for metals (cadmium, chromium and lead) and TRH (C10-C16 Fraction minus naphthalene and C16-C34 Fraction). All other concentrations of chemical analytes were below the adopted assessment criteria.



## 5.0 Conclusions

The baseline due diligence environmental site assessment works undertaken across the site showed that:

- The site is largely sealed except for a small grassed area of Part 34.
- Fill soil was present at the site (up to 2.0 m thick), underlain by natural Port Melbourne Sand.
- Shallow fill soils were impacted by low-level metal, TRH and PAH concentrations; with widespread nickel, zinc and isolated copper and benzo(a)pyrene concentrations above the adopted maintenance of ecosystems criteria. All analysed samples contained chemical concentrations below the human health objectives for commercial land use.
- Groundwater was present at levels ranging from 1.58 m to 2.56 m BTOC, with an inferred flow direction towards the Yarra River.
- Groundwater contained elevated levels of ammonia, sulphate, metals and TRH exceeding the adopted beneficial uses, consistent with regional groundwater quality in the port region.

Based on the results of the due diligence environmental site assessment, the site is considered suitable for ongoing use in a commercial/ industrial, port-related setting.



## 6.0 Principles and Limitations of Investigation

The following principles are an integral part of site contamination assessment practices and are intended to be referred to when resolving any ambiguity or exercising such discretion as is accorded the user or site assessor.

Area	Principle and Limitation
<b>Elimination of Uncertainty</b>	Some uncertainty is inherent in all site investigations. Furthermore, any sample, either surface or subsurface, taken for chemical testing may or may not be representative of a larger population or area. Professional judgment and interpretation are inherent in the process, and even when exercised in accordance with objective scientific principles, uncertainty is inevitable. Additional assessment beyond that which was reasonably undertaken may reduce the uncertainty.
<b>Failure to Detect</b>	Even when site investigation work is executed competently and in accordance with the appropriate Australian guidance, such as the National Environment Protection (Assessment of Site Contamination) Amendment Measure ('the NEPM'), it must be recognised that certain conditions present especially difficult target analyte detection problems. Such conditions may include, but are not limited to, complex geological settings, unusual or generally poorly understood behaviour and fate characteristics of certain substances, complex, discontinuous, random, or heterogeneous distributions of existing target analytes, physical impediments to investigation imposed by the location of services, structures and other man-made objects, and the inherent limitations of assessment technologies.
<b>Limitations of Information</b>	The effectiveness of any site investigation may be compromised by limitations or defects in the information used to define the objectives and scope of the investigation, including inability to obtain information concerning historic site uses or prior site assessment activities despite the efforts of the user and assessor to obtain such information.
<b>Chemical Analysis Error</b>	Chemical testing methods have inherent uncertainties and limitations. Senversa routinely seeks to require the laboratory to report any potential or actual problems experienced, or non-routine events which may have occurred during the testing, so that such problems can be considered in evaluating the data.
<b>Level of Assessment</b>	The investigation herein should not be considered to be an exhaustive assessment of environmental conditions on a property. There is a point at which the effort required to obtain information is outweighed by the time required to obtain that information, and, in the context of private transactions and contractual responsibilities, may become a material detriment to the orderly conduct of business. If the presence of target analytes is confirmed on a property, the extent of further assessment is a function of the degree of confidence required and the degree of uncertainty acceptable in relation to the objectives of the assessment.
<b>Comparison with Subsequent Inquiry</b>	The justification and adequacy of the findings of this investigation in light of the findings of a subsequent inquiry should be evaluated based on the reasonableness of judgments made at the time and under the circumstances in which they were made.
<b>Data Useability</b>	Investigation data generally only represent the site conditions at the time the data were generated. Therefore, the usability of data collected as part of this investigation may have a finite lifetime depending on the application and use being made of the data. In all respects, a future reader of this report should evaluate whether previously generated data are appropriate for any subsequent use beyond the original purpose for which they were collected, or are otherwise subject to lifetime limits imposed by other laws, regulations or regulatory policies.
<b>Nature of Advice</b>	The investigation works herein are intended to develop and present sound, scientifically valid data concerning actual site conditions. Senversa does not seek or purport to provide legal or business advice.



## 6.1 Project Specific Uncertainties

Specific uncertainties and limitations noted for this investigation are as follows:

- The scope of work performed as part of this assessment may not be appropriate to satisfy the needs of any other person. Any other person's use of, or reliance on, the findings, conclusions, recommendations or any other material presented herein, is at that person's sole risk.
- Soil investigations performed at the site were completed by concrete coring and NDD advancement of soil bores. Whilst suitable for characterising soil for chemical contamination, soil boring is generally unsuitable for identification of solid inert waste or hazardous waste materials (e.g. asbestos containing material) within fill. Given that fill was encountered at the site, there is potential for solid inert wastes or hazardous materials to be present at the locations investigated that were not identified during the drilling. The confidence in detecting inert wastes or hazardous materials at the site could be improved by excavating test pits, although this was not completed as part of the works undertaken by Senversa.
- The 32-33 South Wharf portion of the site was predominantly covered by asphalt or concrete that restricted the ability to inspect the ground surface for evidence of contamination or hazardous material debris (including asbestos containing material). If asbestos containing material is identified during construction, an occupational hygienist should be engaged to manage the material in accordance with WorkSafe Guidance Note – Asbestos-contaminated soil, (October 2010).
- The assessment did not include comparison of the data against relevant waste disposal criteria (e.g. Industrial Waste Resource Guidelines Publication 621 or trade waste criteria with water authority) for the off-site disposal of soil and groundwater. The soil and groundwater may comprise other regional or legacy contaminants that could affect management of surplus soil and groundwater associated with infrastructure upgrade works.
- The conclusions drawn about the contamination status of soil and groundwater are based on the current legislation, regulations and guidelines.
- In forming a view on the contamination status of the site Senversa has relied upon the accuracy of information provided within the third-party reports referenced in this report.



## 7.0 References

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USEPA, 2006. *Guidance on Systematic Planning Using the Data Quality Objectives Process*. EPA QA/G-4, United States Environmental Protection Agency. February 2006.



## Figures

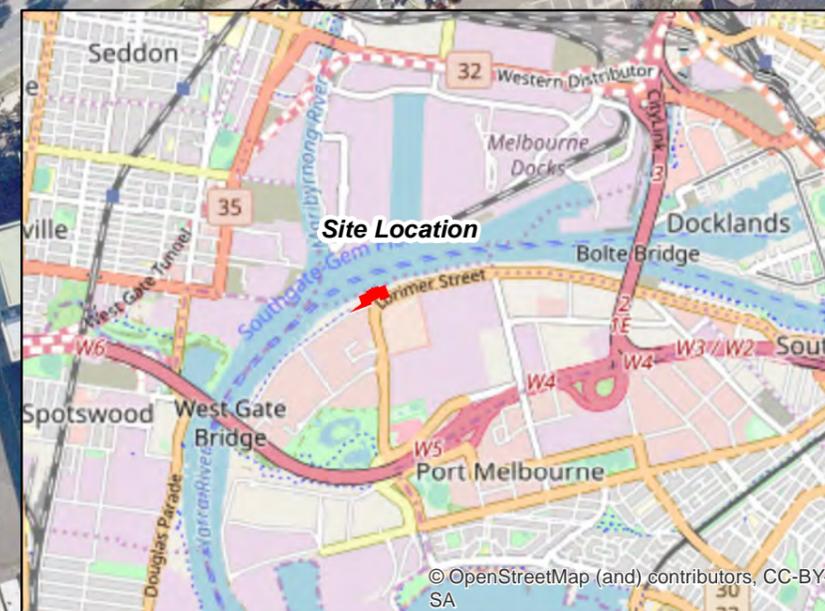
**Figure 1: Site Location Plan**

**Figure 2: Soil Investigation Locations and Exceedances**

**Figure 3: Groundwater Elevation and Exceedances**



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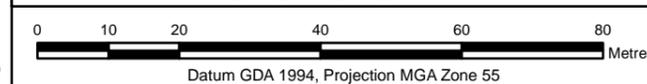
Address: Level 6, 15 William Street  
Melbourne VIC 3000  
Phone: (03) 9606 0070  
Website: www.senversa.com.au

**Legend**

- ▬ Part 34
- ▬ Part 32
- ▬ Part 33

Notes:  
Cadastral and road data sourced from land.vic.gov.au (DELWP)  
Aerial imagery sourced from Nearmap Pty Ltd

Designed:	S. O' Connor	Date:	6/12/2019
Drawn:	F. Gurnett	Revision:	0
Checked:	R. Griffin	Scale:	1:1,000 (A3)
File:	M17571_004_F001_Site_Location		

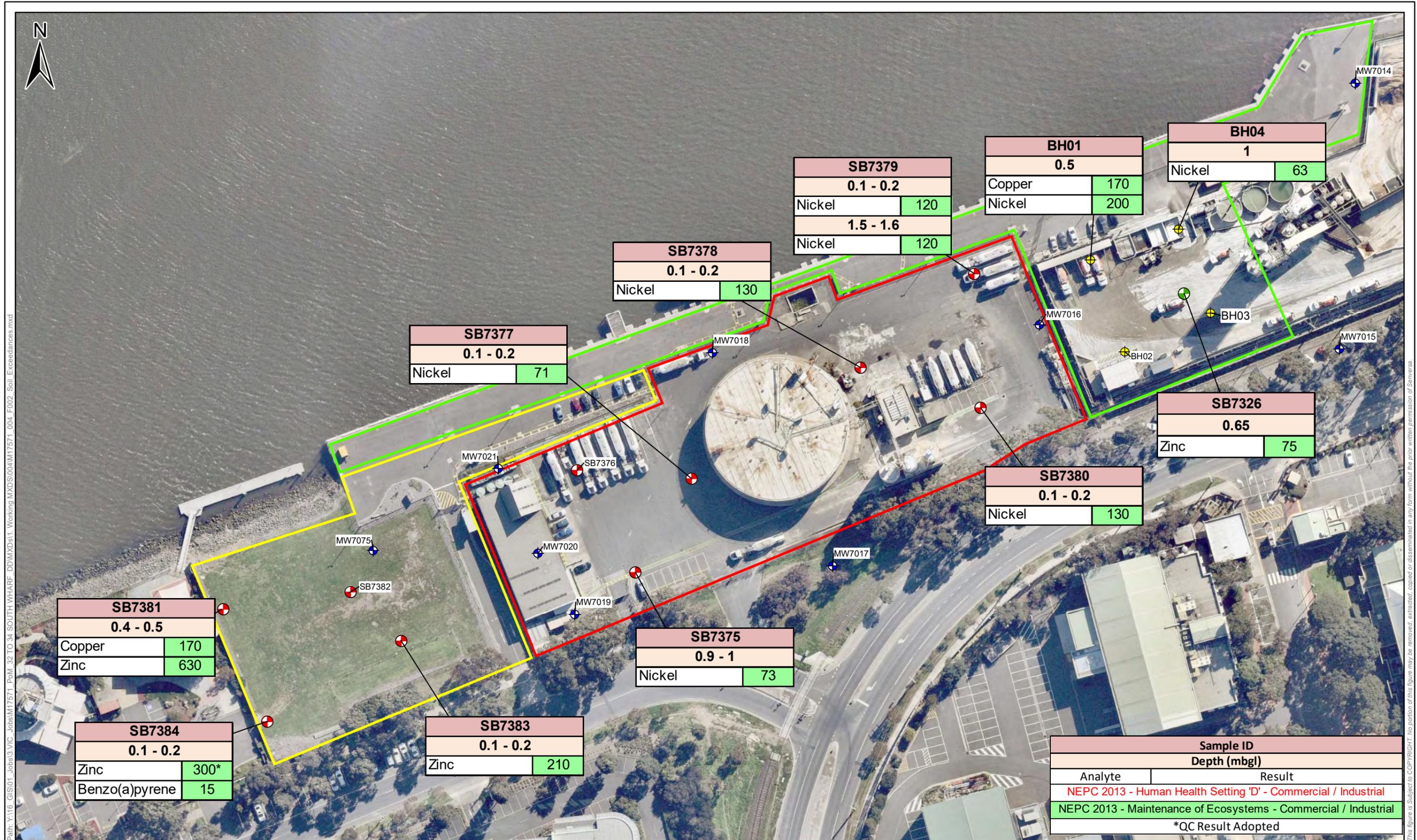


<b>Figure No:</b>	<b>1</b>
<b>Title:</b>	<b>Site Location</b>
Project:	Baseline Due Diligence Environmental Site Assessment
Location:	Part 32, 33 and 34 South Wharf, Port Melbourne
Client:	Port of Melbourne

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Path: Y:\16 GIS\01\_Jobs\3.VIC\_Jobs\M17577\_PoM\_32 TO 34 SOUTH WHARF\_DD\MXD\011\_Working\MXD\0104\M17577\_L\_004\_F002\_Soil\_Exceedances.mxd



Sample ID	
Depth (mbgl)	
Analyte	Result
NEPC 2013 - Human Health Setting 'D' - Commercial / Industrial	
NEPC 2013 - Maintenance of Ecosystems - Commercial / Industrial	
*QC Result Adopted	

Address: Level 6, 15 William Street  
Melbourne VIC 3000  
Phone: (03) 9606 0070  
Website: www.senversa.com.au

- Legend**
- Soil Bore
  - Soil Bore (Bluesphere, 2016)
  - Soil Bore (ESG, 2016)
  - Groundwater Monitoring Well
  - Part 34
  - Part 32
  - Part 33

Notes:  
Cadastre and road data sourced from land.vic.gov.au (DELWP)  
Aerial imagery sourced from Nearmap Pty Ltd

Designed:	S. O' Connor	Date:	6/12/2019
Drawn:	F. Gurnett	Revision:	0
Checked:	R. Griffin	Scale:	1:1,000 (A3)
File:	M17571_004_F002_Soil_Exceedances		

Datum GDA 1994, Projection MGA Zone 55

**Figure No:** 2

**Title:** Soil Investigation Locations and Exceedances

Project: Baseline Due Diligence Environmental Site Assessment

Location: Part 32, 33 and 34 South Wharf, Port Melbourne

Client: Port of Melbourne

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Path: Y:\16\_GIS\01\_Jobs\3.VIC\_Jobs\M17571\_PoM\_32 TO 34 SOUTH WHARF\_DDMMXD0s11\_Working\MXD\S\004\M17571\_004\_F003\_GW\_Exceedances.mxd

MW7075		
Ammonia (as N)	mg/L	1.88
Arsenic (filtered)	mg/L	0.003
Copper (filtered)	mg/L	0.003
Zinc (filtered)	mg/L	0.019

MW7021		
TDS	mg/L	4,270
Sulfate (as SO4) (filtered)	mg/L	835
Copper (filtered)	mg/L	0.007
Nickel (filtered)	mg/L	0.03
Zinc (filtered)	mg/L	0.072

MW7018		
TDS	mg/L	19000*
Ammonia (as N)	mg/L	0.67*
Sulfate (as SO4) (filtered)	mg/L	1600*
Copper (filtered)	mg/L	0.04
Nickel (filtered)	mg/L	0.062
Zinc (filtered)	mg/L	0.202

MW7018  
0.095

MW7016		
TDS	mg/L	970
Arsenic (filtered)	mg/L	0.022
Copper (filtered)	mg/L	0.002
Nickel (filtered)	mg/L	0.012
Zinc (filtered)	mg/L	0.03

MW7016  
0.194

MW7015		
TDS	mg/L	2,700
Ammonia (as N)	mg/L	0.72
Arsenic (filtered)	mg/L	0.015

MW7021  
0.132

MW7020  
0.131

MW7019  
0.093

MW7017

MW7020		
TDS	mg/L	2,400
Ammonia (as N)	mg/L	1.89
Sulfate (as SO4) (filtered)	mg/L	270
Copper (filtered)	mg/L	0.011
Nickel (filtered)	mg/L	0.024
Zinc (filtered)	mg/L	0.084

MW7019		
Ammonia (as N)	mg/L	3.29
Arsenic (filtered)	mg/L	0.044
Cadmium (filtered)	mg/L	0.0008
Chromium (filtered)	mg/L	0.062
Copper (filtered)	mg/L	0.004
Lead (filtered)	mg/L	0.048
Nickel (filtered)	mg/L	0.058
Zinc (filtered)	mg/L	1.15
>C10-C16 -N (F2)	µg/L	1,310
>C16-C34	µg/L	1,320

Sample ID		
Analyte	Units	Result
Maintenance of Ecosystems - 95% Protection - Marine		
Primary Contact Recreation		
*QC Result Adopted		



Address: Level 6, 15 William Street  
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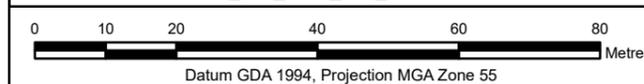
**Legend**

- Groundwater Monitoring Well
- Part 34
- Part 32
- Part 33

Well ID  
Reduced Water Level (mAHD)

Notes:  
Cadastral and road data sourced from land.vic.gov.au (DELWP)  
Aerial imagery sourced from Nearmap Pty Ltd

Designed:	S. O' Connor	Date:	6/12/2019
Drawn:	F. Gurnett	Revision:	0
Checked:	R. Griffin	Scale:	1:1,000 (A3)
File:	M17571_004_F003_GW_Exceedances		



<b>Figure No:</b>	<b>3</b>
<b>Title:</b>	<b>Groundwater Elevation and Exceedances</b>
<b>Project:</b>	Baseline Due Diligence Environmental Site Assessment
<b>Location:</b>	Part 32, 33 and 34 South Wharf, Port Melbourne
<b>Client:</b>	Port of Melbourne

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## Tables

**Table 1: Groundwater Gauging Data**

**Table 2: Stabilised Groundwater Parameters**

**Table 3: Soil Analytical Results**

**Table 4: Groundwater Analytical Results**

**Table 1: Groundwater Gauging and Survey Data**

Project Name Baseline Due Diligence Environmental Site Assessment  
 Client Port of Melbourne  
 Site Address 32-34 South Wharf, Port Melbourne  
 Job Number M17571

Monitoring Well Information						Survey Data			Gauging Data									
Well ID	Well Cover Type	Screened Material	Screen Interval	Highest point of screen	Screen Depth	Easting	Northing	Top of Casing	Date Gauged	Existing Surface	Total Well Depth	Depth to Water	Corrected Depth to Water	Casing Height (if well casing is a stick up type)	SWL	Reduced Water Level	Well Condition	Gauging Comments
			(mBGL)	(mBGL)	(mAHD)	(MGA)	(MGA)	(mAHD)		(mAHD)	(mBTOC)	(mBTOC)	(mBTOC)	(mBGL)	(mAHD)			
MW7015	Flush	Fill / Port Melbourne Sands	1.0-3.5	1.00	0.759	316295.7	5811878.8	1.759	9/10/2019	1.759	2.270	1.575	1.575	0.000	1.575	0.184	Poor. Well blocked at 2.27m bgl.	Good condition
MW7016	Flush	Unknown	1.5-4.5	1.50	0.711	316210.6	5811885.7	2.211	9/10/2019	2.211	4.100	2.017	2.017	0.000	2.017	0.194	Good	Good condition
MW7017	Flush	Fill / Port Melbourne Sands	1.0-4.0	1.00	1.344	316151.9	5811817.4	2.344	9/10/2019	2.344	-	-	-	-	-	-	Poor. Well blocked at 1.62 above the water table	Blocked at 1.62 m BTOC
MW7018	Flush	Fill / Port Melbourne Sands	1.0-4.0	1.00	1.168	316117.8	5811877.8	2.168	9/10/2019	2.168	3.500	2.073	2.073	0.000	2.073	0.095	Good	Good condition
MW7019	Flush	Port Melbourne Sand	1.5-4.5	1.50	0.643	316078.8	5811803.6	2.143	9/10/2019	2.143	2.150	2.050	2.050	0.000	2.050	0.093	Poor. Well blocked at 2.15m bgl.	Blocked with roots and sand at 1.67 m BTOC
MW7020	Flush	Port Melbourne Sand	1.5-4.5	1.50	1.121	316068.3	5811820.9	2.621	9/10/2019	2.621	4.150	2.490	2.490	0.000	2.490	0.131	Good	Good condition
MW7021	Flush	Port Melbourne Sand	1.5-4.5	1.50	1.187	316057.0	5811844.9	2.687	9/10/2019	2.687	6.524	2.555	2.555	0.000	2.555	0.132	Good	Good condition
MW7075	Flush	Moray Street Gravels	23.5-26.5	23.50	-21.246	316021.5	5811821.7	2.254	9/10/2019	2.254	26.950	1.642	1.642	0.000	1.642	0.612	Good	Good condition

\* Use 0.84 unless density calculated and provided by lab

**Table 2: Stabilised Field Chemical Parameters**

Project Baseline Due Diligence Environmental Site Assessment  
 Client Port of Melbourne  
 Site Address 32-34 South Wharf, Port Melbourne  
 Job Number M17571

Monitoring Well Information				Water Quality Stabilised Results									
Well ID	Date Installed	Date Sampled	Well Cover Type	DO (mg/L)	EC (µS/cm)	TDS	pH	Redox (mV)	Temp (°C)	Volume Purged (L)	Field Observations	Sampling Method	Recharge Ability
				±10% (1)	±3% (1)	0.65 conversion	±0.05 (1)	±10mV (1)	±10%				
MW7015	1/10/2005	-	-	-	-	-	-	-	-	-	Insufficient water to get parameters during sampling. Turbid, lightly grey, no odour, no sheen.	Bailer	Poor
MW7016	1/09/2008	9/10/2019	Flush	3.75	1334	867.10	6.3	153.4	18.1	3	Non turbid, brown, no odour, no sheen.	Low flow	Good
MW7018	1/10/2005	9/10/2019	Flush	2.62	24826	16136.90	5.34	215	17.7	2.4	Non turbid, brown, no odour, no sheen.	Low flow	Good
MW7019	1/10/2005	10/10/2019	Flush	-	-	-	-	-	-	-	Insufficient water to get parameters during sampling. Turbid, lightly grey, organic odour, no sheen.	Bailer	Poor
MW7020	1/09/2008	9/10/2019	Flush	4.04	3827	2487.55	5.57	108.7	17.3	3	Non turbid, brown, no odour, no sheen.	Low flow	Good
MW7021	1/09/2008	9/10/2019	Flush	2.58	4715	3064.75	5.55	149.6	18.1	2.8	Non turbid, brown, no odour, no sheen.	Low flow	Good
MW7075	1/09/2008	10/10/2019	Flush	4.2	639	415.35	6.64	128.5	14.5	8	Non turbid, brown, no odour, no sheen.	Bailer	Poor

(1) Values presented are those after stabilisation. In accordance with EPA Publication 669, the parameters were considered stable when three consecutive readings (obtained several minutes apart) were within the specified parameters. Where wells were purged dry due to poor recharge stabilisation may not have occurred. In these instances, final readings were recorded as they were considered most representative of formation water.



**Table 3 - Soil Analytical Results vs Beneficial Use Objectives**  
 Baseline Due Diligence Environmental Site Assessment  
 32-34 South Wharf, Port Melbourne

	Unit	EQL	NEPC 2013 - Human Health Setting 'D' - Commercial / Industrial	NEPC 2013 - Maintenance of Ecosystems - Commercial /	Location Code	SB7380		SB7381		SB7382		SB7383		SB7384						
					Field ID	SB7379_1.5-1	SB7380_0.1-0	SB7380_1.0-1	SB7381_0.4-0.5	SB7381_1.9-2.0	SB7382_0.1-0.2	SB7382_0.8-0.9	SB7383_0.1-0.2	SB7383_0.9-1.0	SB7384_0.1-0.2	QS02	QS03	SB7384_0.4-0.5		
					Date	9/10/2019	9/10/2019	9/10/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019
					Depth	1.5 - 1.6	0.1 - 0.2	1 - 1.1	0.4 - 0.5	1.9 - 2	0.1 - 0.2	0.8 - 0.9	0.1 - 0.2	0.9 - 1	0.1 - 0.2	0.1 - 0.2	0.1 - 0.2	0.1 - 0.2	0.1 - 0.2	0.4 - 0.5
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Lab Report No.	682320	682320	682320	688915	688915	688915	688915	688915	688915	688915	688915	688915	688915	688915	EM1919770	688915				
<b>Physical Parameters</b>																				
Moisture Content	%	1			7.1	8.1	4.9	6.7	19	9.4	5.7	12	9.7	22	21	20.9	21			
pH (CaCl2)	pH Units	0.1			-	-	-	-	-	-	-	-	-	-	-	-	-			
pH (aqueous extract)	pH Units	0.1			9.9	11	8.9	7.9	8.7	8.5	8.0	8.7	8.7	8.5	8.7	-	9.3			
<b>Inorganics</b>																				
Cyanide (as CN)	mg/kg	1			-	-	-	-	-	-	-	-	-	-	-	-	-			
Cyanide (Total)	mg/kg	5	1,500 <sup>#1</sup>		-	-	-	-	-	-	-	-	-	-	-	-	-			
Fluoride	mg/kg	40	47,000 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-	-			
<b>Major Ions</b>																				
Magnesium	mg/kg	10			-	-	-	-	-	-	-	-	-	-	-	-	-			
Sulfate (as SO4)	mg/kg	30			<30	140	32	750	600	<30	<30	<30	41	<30	<30	-	<30			
<b>Metals</b>																				
Aluminium	mg/kg	50	1,100,000 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-	-			
Arsenic	mg/kg	2	3,000 <sup>#1</sup>	160 <sup>#12</sup>	<2	<2	<2	16	6.1	4.8	<2	8.0	4.5	9.6	20	10	24			
Cadmium	mg/kg	0.4	900 <sup>#1</sup>		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	0.7	0.5	<1	<0.4			
Chromium	mg/kg	2	3,600 <sup>#3</sup>	320 <sup>#13</sup>	20	22	<5	31	8.0	14	<5	23	10.0	26	39	21	54			
Chromium(VI)	mg/kg	0.5	3,600 <sup>#1</sup>		-	-	-	-	-	-	-	-	-	-	-	-	-			
Cobalt	mg/kg	2	4,000 <sup>#1</sup>		-	-	-	-	-	-	-	-	-	-	-	-	-			
Copper	mg/kg	5	240,000 <sup>#1</sup>	95 <sup>#14</sup>	40	45	<5	170	<5	34	<5	44	<5	86	70	94	21			
Iron	mg/kg	50	820,000 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-	-			
Lead	mg/kg	5	1,500 <sup>#4</sup>	1,830 <sup>#15</sup>	<5	<5	<5	80	<5	320	<5	40	<5	46	55	42	12			
Manganese	mg/kg	5	60,000 <sup>#1</sup>		-	-	-	-	-	-	-	-	-	-	-	-	-			
Mercury	mg/kg	0.1	730 <sup>#1</sup>		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.1	0.2	<0.1			
Molybdenum	mg/kg	2	5,800 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-	-			
Nickel	mg/kg	2	6,000 <sup>#1</sup>	60 <sup>#14</sup>	120	130	<5	17	<5	22	<5	57	7.4	39	33	31	32			
Selenium	mg/kg	2	10,000 <sup>#1</sup>		-	-	-	-	-	-	-	-	-	-	-	-	-			
Silver	mg/kg	0.2	5,800 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-	-			
Tin	mg/kg	5	700,000 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-	-			
Zinc	mg/kg	5	400,000 <sup>#1</sup>	150 <sup>#14</sup>	70	71	<5	630	5.1	98	<5	210	8.9	200	300	169	50			
<b>BTEX</b>																				
Benzene	mg/kg	0.1	3 <sup>#5</sup>	75 <sup>#16</sup>	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1			
Toluene	mg/kg	0.1	99,000 <sup>#5</sup>	135 <sup>#16</sup>	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1			
Ethylbenzene	mg/kg	0.1	27,000 <sup>#5</sup>	165 <sup>#16</sup>	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1			
Xylene (m & p)	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2			
Xylene (o)	mg/kg	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1			
Total Xylene	mg/kg	0.3	230 <sup>#5</sup>	95 <sup>#17</sup>	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.5	<0.3			
Total BTEX	mg/kg	0.2			-	-	-	-	-	-	-	-	-	-	-	<0.2	-			
<b>Total Petroleum Hydrocarbons</b>																				
C6-C9 Fraction	mg/kg	10	260 <sup>#6</sup>	215 <sup>#18</sup>	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<10	<20			
C10-C14 Fraction	mg/kg	20	20,000 <sup>#7</sup>	170 <sup>#19</sup>	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<50	<20			
C15-C28 Fraction	mg/kg	50			<50	<50	<50	<50	<50	<50	<50	<50	<50	620	<50	400	<50			
C29-C36 Fraction	mg/kg	50			<50	<50	<50	<50	<50	<50	<50	<50	<50	640	<50	280	<50			
C10-C36 Fraction (Sum)	mg/kg	50			<50	<50	<50	<50	<50	<50	<50	<50	<50	1,260	<50	680	<50			
<b>Total Recoverable Hydrocarbons</b>																				
C6-C10 Fraction	mg/kg	10			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<10	<20			
C6-C10 Fraction minus BTEX (F1)	mg/kg	10	260 <sup>#8</sup>	215	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<10	<20			
>C10-C16 Fraction	mg/kg	50			<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50			
>C10-C16 Fraction minus naphthalene (F2)	mg/kg	50	20,000 <sup>#9</sup>		<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50			
>C16-C34 Fraction	mg/kg	100	27,000 <sup>#10</sup>	1,700 <sup>#20</sup>	<100	<100	<100	<100	<100	<100	<100	<100	<100	1,100	<100	600	<100			
>C34-C40 Fraction	mg/kg	100	38,000 <sup>#10</sup>	3,300 <sup>#20</sup>	<100	<100	<100	<100	<100	<100	<100	<100	<100	310	<100	140	<100			
>C10-C40 Fraction (Sum)	mg/kg	50			<100	<100	<100	<100	<100	<100	<100	<100	<100	1,410	<100	740	<100			
<b>PAHs</b>																				
Acenaphthene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Acenaphthylene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Anthracene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Benz(a)anthracene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5.9	<0.5	1.7	<0.5			
Benzo(a)pyrene	mg/kg	0.5		1.4 <sup>#21</sup>	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	15	<0.5	2.6	<0.5			
Benzo(b+j)fluoranthene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6.3	<0.5	3.0	<0.5			
Benzo(g,h,i)perylene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4.2	<0.5	1.0	<0.5			
Benzo(b+k)fluoranthene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-			
Benzo(k)fluoranthene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6.9	<0.5	1.1	<0.5			
Chrysene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	11	<0.5	1.7	<0.5			
Dibenz(a,h)anthracene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.0	<0.5	<0.5	<0.5			
Fluoranthene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	15	<0.5	2.0	<0.5			
Fluorene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.4	<0.5	0.9	<0.5			
Naphthalene	mg/kg	0.5	11,000 <sup>#5</sup>	370 <sup>#22</sup>	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			
Phenanthrene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5			
Pyrene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	18	<0.5	2.6	<0.5			
Benzo(a)pyrene TEQ (Zero)	mg/kg	0.5	40 <sup>#1</sup>		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	18	<0.5	3.3	<0.5			
Sum of Polycyclic aromatic hydrocarbons (PAH)	mg/kg	0.5	4,000 <sup>#1</sup>		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	87.5	<0.5	16.6	<0.5			

**Table 3 - Soil Analytical Results vs Beneficial Use Objectives**  
 Baseline Due Diligence Environmental Site Assessment  
 32-34 South Wharf, Port Melbourne

	Unit	EQL	NEPC 2013 - Human Health Setting 'D' - Commercial / Industrial	NEPC 2013 - Maintenance of Ecosystems - Commercial /	Location Code				SB7326				SB7375				SB7376		SB7377		SB7378		SB7
					Field ID	BH01_0.5	BH02_0.1	BH03_1.0	BH04_1.0	SB7326/0.65	SB7326/1.0	SB7375_0.5-0.6	QC05	QC06	SB7375_0.9-1.0	SB7376_0.1-0.2	SB7376_1.5-1.6	SB7377_0.1-0.2	SB7377_1.5-1.6	SB7378_0.1-0.2	SB7378_1.0-1.1	SB7379_0.1-0.2	
					Date	20/10/2016	20/10/2016	20/10/2016	20/10/2016	3/11/2016	3/11/2016	9/10/2019	9/10/2019	9/10/2019	9/10/2019	9/10/2019	9/10/2019	9/10/2019	9/10/2019	9/10/2019	9/10/2019	9/10/2019	9/10/2019
					Depth	0.5	0.1	1	1	0.65	1	0.5 - 0.6	0.5 - 0.6	0.5 - 0.6	0.9 - 1	0.1 - 0.2	1.5 - 1.6	0.1 - 0.2	1.5 - 1.6	0.1 - 0.2	1 - 1.1	0.1 - 0.2	
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Field_D	Interlab_D	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal					
Lab Report No.	520784	520784	520784	520784	EM1613241	EM1613241	682320	682320	EM1917208	682320	682320	682320	682320	682320	682320	682320	682320	682320					
Phenols (Total Non Chlorinated)	mg/kg				-	-	-	-	0.00	-	-	-	-	-	-	-	-	-					
Phenols (non-halogenated)	mg/kg	1			-	-	-	<20	<1.0	-	-	-	-	-	-	-	-	-					
<b>MAH</b>																							
1,2,4-Trimethylbenzene	mg/kg	0.05	1,800 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
1,3,5-Trimethylbenzene	mg/kg	0.05	1,500 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
Isopropylbenzene	mg/kg	0.05	9,900 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
Styrene	mg/kg	0.05	35,000 <sup>#2</sup>		-	-	-	<0.05	<0.5	-	-	-	-	-	-	-	-	-					
Total Monocyclic Aromatic Hydrocarbons	mg/kg	0.2			-	-	-	-	<0.2	0.00	-	-	-	-	-	-	-	-					
<b>Halogenated Benzenes</b>																							
1,2-Dichlorobenzene	mg/kg	0.02	9,300 <sup>#2</sup>		-	-	-	<0.05	<0.02	-	-	-	-	-	-	-	-	-					
1,2,4-Trichlorobenzene	mg/kg	0.01	110 <sup>#2</sup>		-	-	-	<0.2	<0.01	-	-	-	-	-	-	-	-	-					
1,3-Dichlorobenzene	mg/kg	0.05			-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
1,4-Dichlorobenzene	mg/kg	0.02	11 <sup>#2</sup>		-	-	-	<0.05	<0.02	-	-	-	-	-	-	-	-	-					
4-Chlorotoluene	mg/kg	0.05	23,000 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
Bromobenzene	mg/kg	0.05	1,800 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
Chlorobenzene	mg/kg	0.02	1,300 <sup>#2</sup>		-	-	-	<0.05	<0.02	-	-	-	-	-	-	-	-	-					
<b>Halogenated Hydrocarbons</b>																							
1,2-Dibromoethane	mg/kg	0.05	0.16 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
Bromomethane	mg/kg	0.05	30 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
Dichlorodifluoromethane	mg/kg	0.05	370 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
Iodomethane	mg/kg	0.05			-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
Trichlorofluoromethane	mg/kg	0.05	350,000 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
<b>Chlorinated Hydrocarbons</b>																							
1,1-Dichloroethane	mg/kg	0.05	16 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
1,1-Dichloroethene	mg/kg	0.01	1,000 <sup>#2</sup>		-	-	-	<0.05	<0.01	-	-	-	-	-	-	-	-	-					
1,1,1,2-Tetrachloroethane	mg/kg	0.01	8.8 <sup>#2</sup>		-	-	-	<0.05	<0.01	-	-	-	-	-	-	-	-	-					
1,1,1-Trichloroethane	mg/kg	0.01	36,000 <sup>#2</sup>		-	-	-	<0.05	<0.01	-	-	-	-	-	-	-	-	-					
1,1,2-Trichloroethane	mg/kg	0.04	5 <sup>#2</sup>		-	-	-	<0.05	<0.04	-	-	-	-	-	-	-	-	-					
1,1,2,2-Tetrachloroethane	mg/kg	0.02	2.7 <sup>#2</sup>		-	-	-	<0.05	<0.02	-	-	-	-	-	-	-	-	-					
1,2,3-Trichloropropane	mg/kg	0.05	0.11 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
1,2-Dichloroethane	mg/kg	0.02	2 <sup>#2</sup>		-	-	-	<0.05	<0.02	-	-	-	-	-	-	-	-	-					
1,3-Dichloropropane	mg/kg	0.05	23,000 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
1,2-Dichloropropane	mg/kg	0.05	11 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
Bromochloromethane	mg/kg	0.05	630 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
Bromodichloromethane	mg/kg	0.05	1.3 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
Bromoform	mg/kg	0.05	86 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
Carbon Tetrachloride	mg/kg	0.01	2.9 <sup>#2</sup>		-	-	-	<0.05	<0.01	-	-	-	-	-	-	-	-	-					
Chlorodibromomethane	mg/kg	0.05	39 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
Chloroethane	mg/kg	0.05	57,000 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
Chloroform	mg/kg	0.02	1.4 <sup>#2</sup>		-	-	-	<0.05	<0.02	-	-	-	-	-	-	-	-	-					
Chloromethane	mg/kg	0.05	460 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
cis-1,2-Dichloroethene	mg/kg	0.01	2,300 <sup>#2</sup>		-	-	-	<0.05	<0.01	-	-	-	-	-	-	-	-	-					
Dibromomethane	mg/kg	0.05	99 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
cis-1,3-Dichloropropene	mg/kg	0.05			-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
Dichloromethane	mg/kg	0.05	1,000 <sup>#2</sup>		-	-	-	<0.05	<0.4	-	-	-	-	-	-	-	-	-					
Hexachlorobutadiene	mg/kg	0.02	5.3 <sup>#2</sup>		-	-	-	<0.2	<0.02	-	-	-	-	-	-	-	-	-					
Tetrachloroethene	mg/kg	0.02	100 <sup>#2</sup>		-	-	-	<0.05	<0.02	-	-	-	-	-	-	-	-	-					
trans-1,2-Dichloroethene	mg/kg	0.02	23,000 <sup>#2</sup>		-	-	-	<0.05	<0.02	-	-	-	-	-	-	-	-	-					
trans-1,3-Dichloropropene	mg/kg	0.05			-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-					
Trichloroethene	mg/kg	0.02	6 <sup>#2</sup>		-	-	-	<0.05	<0.02	-	-	-	-	-	-	-	-	-					
Vinyl Chloride	mg/kg	0.02	1.7 <sup>#2</sup>		-	-	-	<0.05	<0.02	-	-	-	-	-	-	-	-	-					
Total Chlorinated Hydrocarbons	mg/kg	0.01			-	-	-	<0.01	-	-	-	-	-	-	-	-	-	-					
Total Other Chlorinated Hydrocarbons	mg/kg	0.01			-	-	-	<0.01	-	-	-	-	-	-	-	-	-	-					
<b>Halogenated Phenols</b>																							
2,4,5-Trichlorophenol	mg/kg	0.05	82,000 <sup>#2</sup>		-	-	-	<1	<0.05	-	-	-	-	-	-	-	-	-					
2,4,6-Trichlorophenol	mg/kg	0.05	210 <sup>#2</sup>		-	-	-	<1	<0.05	-	-	-	-	-	-	-	-	-					
2,4-Dichlorophenol	mg/kg	0.03	2,500 <sup>#2</sup>		-	-	-	<0.5	<0.03	-	-	-	-	-	-	-	-	-					
2,6-Dichlorophenol	mg/kg	0.03			-	-	-	<0.5	<0.03	-	-	-	-	-	-	-	-	-					
2-Chlorophenol	mg/kg	0.03	5,800 <sup>#2</sup>		-	-	-	<0.5	<0.03	-	-	-	-	-	-	-	-	-					
Pentachlorophenol	mg/kg	0.2	660 <sup>#1</sup>		-	-	-	<1	<0.2	-	-	-	-	-	-	-	-	-					
2,3,5,6-Tetrachlorophenol	mg/kg	0.03			-	-	-	-	<0.03	-	-	-	-	-	-	-	-	-					
2,3,4,5 & 2,3,4,6-Tetrachlorophenol	mg/kg	0.05			-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-					
Tetrachlorophenols	mg/kg	1			-	-	-	<1	-	-	-	-	-	-	-	-	-	-					
Phenols (Halogenated)	mg/kg	0.03			-	-	-	<1	<0.03	-	-	-	-	-	-	-	-	-					
<b>Organochlorine Pesticides</b>																							
a-BHC	mg/kg	0.03	0.36 <sup>#2</sup>		-	-	-	<0.05	<0.03	-	-	-	-	-	-	-	-	-					
b-BHC	mg/kg	0.03	1.3 <sup>#2</sup>		-	-	-	<0.05	<0.03	-	-	-	-	-	-	-	-	-					
d-BHC	mg/kg	0.03			-	-	-	<0.05	<0.03	-	-	-	-	-	-	-	-	-					
Dieldrin	mg/kg	0.03			-	-	-	<0.05	<0.03	-	-	-	-	-	-	-	-	-					
g-BHC (Lindane)	mg/kg	0.03	2.5 <sup>#2</sup>		-	-	-	<0.05	<0.03	-	-	-	-	-	-	-	-	-					
Aldrin	mg/kg	0.03			-	-	-	<0.05	<0.03	-	-	-	-	-	-	-	-	-					
Aldrin + Dieldrin	mg/kg	0.03	45 <sup>#1</sup>		-	-	-	<0.05	<0.03	-	-	-	-	-	-	-	-	-					
Chlordane	mg/kg	0.03	530 <sup>#1</sup>		-	-	-	<0.1	<0.03	-	-	-	-	-	-	-	-	-					
DDT	mg/kg	0.05			-	-	-	<0.05	<0.05	-	-	-	-	-	-	-	-	-					
4,4-DDE	mg/kg	0.05			-	-	-	<0.05	<0.05	-	-	-	-										

**Table 3 - Soil Analytical Results vs Beneficial Use Objectives**  
 Baseline Due Diligence Environmental Site Assessment  
 32-34 South Wharf, Port Melbourne

	Unit	EQL	NEPC 2013 - Human Health Setting 'D' - Commercial / Industrial	NEPC 2013 - Maintenance of Ecosystems - Commercial /	Location Code	SB7380		SB7381		SB7382		SB7383		SB7384						
					Field ID	SB7379_1.5-1	SB7380_0.1-0	SB7380_1.0-1	SB7381_0.4-0.5	SB7381_1.9-2.0	SB7382_0.1-0.2	SB7382_0.8-0.9	SB7383_0.1-0.2	SB7383_0.9-1.0	SB7384_0.1-0.2	QS02	QS03	SB7384_0.4-0.5		
					Date	9/10/2019	9/10/2019	9/10/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019
					Depth	1.5 - 1.6	0.1 - 0.2	1 - 1.1	0.4 - 0.5	1.9 - 2	0.1 - 0.2	0.8 - 0.9	0.1 - 0.2	0.9 - 1	0.1 - 0.2	0.1 - 0.2	0.1 - 0.2	0.1 - 0.2	0.1 - 0.2	0.4 - 0.5
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Field_D	Interlab_D	Normal
Lab Report No.	682320	682320	682320	688915	688915	688915	688915	688915	688915	688915	688915	688915	688915	688915	EM1919770	688915				
Phenols (Total Non Chlorinated)	mg/kg				-	-	-	-	-	-	-	-	-	-	-	-				
Phenols (non-halogenated)	mg/kg	1			-	-	-	-	-	-	-	-	-	-	-	-				
<b>MAH</b>																				
1,2,4-Trimethylbenzene	mg/kg	0.05	1,800 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
1,3,5-Trimethylbenzene	mg/kg	0.05	1,500 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Isopropylbenzene	mg/kg	0.05	9,900 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Styrene	mg/kg	0.05	35,000 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Total Monocyclic Aromatic Hydrocarbons	mg/kg	0.2			-	-	-	-	-	-	-	-	-	-	-	-				
<b>Halogenated Benzenes</b>																				
1,2-Dichlorobenzene	mg/kg	0.02	9,300 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
1,2,4-Trichlorobenzene	mg/kg	0.01	110 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
1,3-Dichlorobenzene	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-				
1,4-Dichlorobenzene	mg/kg	0.02	11 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
4-Chlorotoluene	mg/kg	0.05	23,000 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Bromobenzene	mg/kg	0.05	1,800 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Chlorobenzene	mg/kg	0.02	1,300 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
<b>Halogenated Hydrocarbons</b>																				
1,2-Dibromoethane	mg/kg	0.05	0.16 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Bromomethane	mg/kg	0.05	30 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Dichlorodifluoromethane	mg/kg	0.05	370 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Iodomethane	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-				
Trichlorofluoromethane	mg/kg	0.05	350,000 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
<b>Chlorinated Hydrocarbons</b>																				
1,1-Dichloroethane	mg/kg	0.05	16 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
1,1-Dichloroethene	mg/kg	0.01	1,000 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
1,1,1,2-Tetrachloroethane	mg/kg	0.01	8.8 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
1,1,1-Trichloroethane	mg/kg	0.01	36,000 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
1,1,2-Trichloroethane	mg/kg	0.04	5 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
1,1,2,2-Tetrachloroethane	mg/kg	0.02	2.7 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
1,2,3-Trichloropropane	mg/kg	0.05	0.11 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
1,2-Dichloroethane	mg/kg	0.02	2 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
1,3-Dichloropropane	mg/kg	0.05	23,000 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
1,2-Dichloropropane	mg/kg	0.05	11 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Bromochloromethane	mg/kg	0.05	630 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Bromodichloromethane	mg/kg	0.05	1.3 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Bromoform	mg/kg	0.05	86 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Carbon Tetrachloride	mg/kg	0.01	2.9 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Chlorodibromomethane	mg/kg	0.05	39 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Chloroethane	mg/kg	0.05	57,000 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Chloroform	mg/kg	0.02	1.4 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Chloromethane	mg/kg	0.05	460 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
cis-1,2-Dichloroethene	mg/kg	0.01	2,300 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Dibromomethane	mg/kg	0.05	99 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
cis-1,3-Dichloropropene	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-				
Dichloromethane	mg/kg	0.05	1,000 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Hexachlorobutadiene	mg/kg	0.02	5.3 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Tetrachloroethene	mg/kg	0.02	100 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
trans-1,2-Dichloroethene	mg/kg	0.02	23,000 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
trans-1,3-Dichloropropene	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-				
Trichloroethene	mg/kg	0.02	6 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Vinyl Chloride	mg/kg	0.02	1.7 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Total Chlorinated Hydrocarbons	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-	-				
Total Other Chlorinated Hydrocarbons	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	-	-				
<b>Halogenated Phenols</b>																				
2,4,5-Trichlorophenol	mg/kg	0.05	82,000 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
2,4,6-Trichlorophenol	mg/kg	0.05	210 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
2,4-Dichlorophenol	mg/kg	0.03	2,500 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
2,6-Dichlorophenol	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	-	-				
2-Chlorophenol	mg/kg	0.03	5,800 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Pentachlorophenol	mg/kg	0.2	660 <sup>#1</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
2,3,5,6-Tetrachlorophenol	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	-	-				
2,3,4,5 & 2,3,4,6-Tetrachlorophenol	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-				
Tetrachlorophenols	mg/kg	1			-	-	-	-	-	-	-	-	-	-	-	-				
Phenols (Halogenated)	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	-	-				
<b>Organochlorine Pesticides</b>																				
a-BHC	mg/kg	0.03	0.36 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
b-BHC	mg/kg	0.03	1.3 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
d-BHC	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	-	-				
Dieldrin	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	-	-				
g-BHC (Lindane)	mg/kg	0.03	2.5 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Aldrin	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	-	-				
Aldrin + Dieldrin	mg/kg	0.03	45 <sup>#1</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Chlordane	mg/kg	0.03	530 <sup>#1</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
DDT	mg/kg	0.05		640 <sup>#22</sup>	-	-	-	-	-	-	-	-	-	-	-	-				
4,4-DDE	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-				
DDD	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-				
DDT+DDE+DDD	mg/kg	0.05	3,600 <sup>#1</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Endosulfan I	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	-	-				
Endosulfan II	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	-	-				
Endosulfan sulfate	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	-	-				
Endrin	mg/kg	0.03	100 <sup>#1</sup>		-	-	-	-	-	-	-	-	-	-	-	-				

**Table 3 - Soil Analytical Results vs Beneficial Use Objectives**  
 Baseline Due Diligence Environmental Site Assessment  
 32-34 South Wharf, Port Melbourne

	Unit	EQL	NEPC 2013 - Human Health Setting 'D' - Commercial / Industrial	NEPC 2013 - Maintenance of Ecosystems - Commercial /	Location Code	BH01	BH02	BH03	BH04	SB7326		SB7375			SB7376		SB7377		SB7378		SB7	
					Field ID	BH01_0.5	BH02_0.1	BH03_1.0	BH04_1.0	SB7326/0.65	SB7326/1.0	SB7375_0.5-0.9	QC05	QC06	SB7375_0.9-1	SB7376_0.1-0.9	SB7376_1.5-1	SB7377_0.1-0.9	SB7377_1.5-1	SB7378_0.1-0.9	SB7378_1.0-1	SB7379_0.1-0.9
Date					20/10/2016	20/10/2016	20/10/2016	20/10/2016	20/10/2016	3/11/2016	3/11/2016	9/10/2019	9/10/2019	9/10/2019	9/10/2019	9/10/2019	9/10/2019	9/10/2019	9/10/2019	9/10/2019	9/10/2019	
Depth					0.5	0.1	1	1	1	0.65	1	0.5 - 0.6	0.5 - 0.6	0.5 - 0.6	0.9 - 1	0.1 - 0.2	1.5 - 1.6	0.1 - 0.2	1.5 - 1.6	0.1 - 0.2	1 - 1.1	0.1 - 0.2
Sample Type					Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Field_D	Interlab_D	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Lab Report No.					520784	520784	520784	520784	520784	EM1613241	EM1613241	682320	682320	EM1917208	682320	682320	682320	682320	682320	682320	682320	682320
Chlordane (cis)	mg/kg	0.03			-	-	-	-	-	<0.03	-	-	-	-	-	-	-	-	-	-	-	-
Chlordane (trans)	mg/kg	0.03			-	-	-	-	-	<0.03	-	-	-	-	-	-	-	-	-	-	-	-
Endrin aldehyde	mg/kg	0.03			-	-	-	<0.05	<0.03	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin ketone	mg/kg	0.05			-	-	-	<0.05	<0.03	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	mg/kg	0.03	50 <sup>#1</sup>		-	-	-	<0.05	<0.03	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	mg/kg	0.03	0.33 <sup>#2</sup>		-	-	-	<0.05	<0.03	-	-	-	-	-	-	-	-	-	-	-	-	-
Methoxychlor	mg/kg	0.03	2,500 <sup>#1</sup>		-	-	-	<0.05	<0.03	-	-	-	-	-	-	-	-	-	-	-	-	-
Toxaphene	mg/kg	1	160 <sup>#1</sup>		-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organochlorine Pesticides (EPAVic)	mg/kg	0.03			-	-	-	-	<0.03	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Organochlorine Pesticides (EPAVic)	mg/kg	0.03			-	-	-	-	<0.03	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Herbicides</b>																						
Dinoseb	mg/kg	5	820 <sup>#2</sup>		-	-	-	<20	<5.0	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Fungicides</b>																						
Hexachlorobenzene	mg/kg	0.03	80 <sup>#1</sup>		-	-	-	<0.05	<0.03	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Polychlorinated Biphenyls</b>																						
Aroclor 1016	mg/kg	0.1			-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor 1221	mg/kg	0.1			-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor 1232	mg/kg	0.1			-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor 1242	mg/kg	0.1			-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor 1248	mg/kg	0.1			-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor 1254	mg/kg	0.1			-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor 1260	mg/kg	0.1			-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1	7 <sup>#1</sup>		-	-	-	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Solvents</b>																						
Methyl Ethyl Ketone (MEK)	mg/kg	0.05	190,000 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone	mg/kg	0.05	140,000 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg	0.05	670,000 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Allyl chloride	mg/kg	0.05	3.2 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	mg/kg	0.05	3,500 <sup>#2</sup>		-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-

**Comments**

- #1 NEPC (2013) - HIL 'D'.
- #2 USEPA RSLs (November 2018 Update) - Industrial.
- #3 NEPC (2013) - HIL 'D'. Value is for Chromium (VI). Refer Cr III and Cr VI results if speciated data are available.
- #4 NEPC (2013) - HIL 'D'. Assumes 50% bioavailability. Consider site-specific bioavailability where appropriate.
- #5 Friebel & Nadebaum (2011) - HSL-D.
- #6 HSL for TRH F1 adopted for this historical fraction. Where F1 data are available, screening based on this fraction is not required.
- #7 HSL for TRH F2 adopted for this historical fraction. Where F2 data are available, screening based on this fraction is not required.
- #8 HSL based on vapour intrusion pathway (sand <1 m depth)
- #9 HSL based on direct contact pathways (Friebel and Nadebaum, 2011) as vapour intrusion HSL is not limiting.
- #10 HSL based on direct contact pathways (Friebel and Nadebaum, 2011) as fraction is not volatile.
- #11 NEPC (2013) - HIL 'D'. Relates to non-dioxin like PCBs only. Where a PCB source is known or suspected, site-specific risk assessment should be undertaken.
- #12 NEPC (2013) EIL - Commercial and Industrial. Value applies to aged arsenic (contamination present in soil for at least two years). For fresh contamination refer Schedule B7 of the NEPM.
- #13 NEPC (2013) EIL - Commercial and Industrial. Value is for chromium III. Initial screening value applicable to all aged soils (see text). Derive site-specific value if contamination is fresh (<2 years) or if EILs are exceeded.
- #14 NEPC (2013) EIL - Commercial and Industrial. Initial screening value applicable to all aged soils (see text). Derive site-specific value if contamination is fresh (<2 years) or if EILs are exceeded.
- #15 NEPC (2013) EIL - Commercial and Industrial. Initial screening value applicable to all aged soils (see text). Derive site-specific value if contamination is fresh (<2 years) or if EILs are exceeded. Assumes ABC of 30 mg/kg
- #16 NEPC (2013) ESL - Commercial and Industrial. Coarse soil value adopted for initial screening.
- #17 NEPC (2013) ESL - Commercial and Industrial. Fine soil value (most conservative) adopted for initial screening.
- #18 ESL for TRH F1 adopted for this historical fraction. Where F1 data are available, screening based on this fraction is not required.
- #19 ESL for TRH >C10-C16 adopted for this historical fraction. Where >C10-C16 data are available, screening based on this fraction is not required.
- #20 ESL for coarse soil adopted for initial screening.
- #21 NEPC (2013) ESL - Commercial and Industrial. Value applies to both coarse and fine soil.
- #22 NEPC (2013) EIL - Commercial and Industrial. Value applies to both fresh and aged contamination.

**Table 3 - Soil Analytical Results vs Beneficial Use Objectives**  
 Baseline Due Diligence Environmental Site Assessment  
 32-34 South Wharf, Port Melbourne

	Unit	EQL	NEPC 2013 - Human Health Setting 'D' - Commercial / Industrial	NEPC 2013 - Maintenance of Ecosystems - Commercial /	Location Code	SB7380		SB7381		SB7382		SB7383		SB7384						
					Field ID	SB7379_1.5-1	SB7380_0.1-0.2	SB7380_1.0-1	SB7381_0.4-0.5	SB7381_1.9-2.0	SB7382_0.1-0.2	SB7382_0.8-0.9	SB7383_0.1-0.2	SB7383_0.9-1.0	SB7384_0.1-0.2	QS02	QS03	SB7384_0.4-0.5		
					Date	9/10/2019	9/10/2019	9/10/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019	19/11/2019
					Depth	1.5 - 1.6	0.1 - 0.2	1 - 1.1	0.4 - 0.5	1.9 - 2	0.1 - 0.2	0.8 - 0.9	0.1 - 0.2	0.9 - 1	0.1 - 0.2	0.1 - 0.2	0.1 - 0.2	0.1 - 0.2	0.1 - 0.2	0.4 - 0.5
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Field_D	Interlab_D	Normal
Lab Report No.	682320	682320	682320	688915	688915	688915	688915	688915	688915	688915	688915	688915	688915	EM1919770	688915					
Chlordane (cis)	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	-	-				
Chlordane (trans)	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	-	-				
Endrin aldehyde	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	-	-				
Endrin ketone	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	-	-				
Heptachlor	mg/kg	0.03	50 <sup>#1</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Heptachlor epoxide	mg/kg	0.03	0.33 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Methoxychlor	mg/kg	0.03	2,500 <sup>#1</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Toxaphene	mg/kg	1	160 <sup>#1</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Organochlorine Pesticides (EPAVic)	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	-	-				
Other Organochlorine Pesticides (EPAVic)	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	-	-				
<b>Herbicides</b>																				
Dinoseb	mg/kg	5	820 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
<b>Fungicides</b>																				
Hexachlorobenzene	mg/kg	0.03	80 <sup>#1</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
<b>Polychlorinated Biphenyls</b>																				
Aroclor 1016	mg/kg	0.1			-	-	-	-	-	-	-	-	-	-	-	-				
Aroclor 1221	mg/kg	0.1			-	-	-	-	-	-	-	-	-	-	-	-				
Aroclor 1232	mg/kg	0.1			-	-	-	-	-	-	-	-	-	-	-	-				
Aroclor 1242	mg/kg	0.1			-	-	-	-	-	-	-	-	-	-	-	-				
Aroclor 1248	mg/kg	0.1			-	-	-	-	-	-	-	-	-	-	-	-				
Aroclor 1254	mg/kg	0.1			-	-	-	-	-	-	-	-	-	-	-	-				
Aroclor 1260	mg/kg	0.1			-	-	-	-	-	-	-	-	-	-	-	-				
PCBs (Sum of total)	mg/kg	0.1	7 <sup>#1</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
<b>Solvents</b>																				
Methyl Ethyl Ketone (MEK)	mg/kg	0.05	190,000 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
4-Methyl-2-pentanone	mg/kg	0.05	140,000 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Acetone	mg/kg	0.05	670,000 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Allyl chloride	mg/kg	0.05	3.2 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				
Carbon disulfide	mg/kg	0.05	3,500 <sup>#2</sup>		-	-	-	-	-	-	-	-	-	-	-	-				

**Comments**

- #1 NEPC (2013) - HIL 'D'.
- #2 USEPA RSLs (November 2018 Update) - Industrial.
- #3 NEPC (2013) - HIL 'D'. Value is for Chromium (VI). Refer Cr III and Cr VI results if speciated data are available.
- #4 NEPC (2013) - HIL 'D'. Assumes 50% bioavailability. Consider site-specific bioavailability where appropriate.
- #5 Friebel & Nadebaum (2011) - HSL-D.
- #6 HSL for TRH F1 adopted for this historical fraction. Where F1 data are available, screening based on this fraction.
- #7 HSL for TRH F2 adopted for this historical fraction. Where F2 data are available, screening based on this fraction.
- #8 HSL based on vapour intrusion pathway (sand <1 m depth)
- #9 HSL based on direct contact pathways (Friebel and Nadebaum, 2011) as vapour intrusion HSL is not limiting.
- #10 HSL based on direct contact pathways (Friebel and Nadebaum, 2011) as fraction is not volatile.
- #11 NEPC (2013) - HIL 'D'. Relates to non-dioxin like PCBs only. Where a PCB source is known or suspected.
- #12 NEPC (2013) EIL - Commercial and Industrial. Value applies to aged arsenic (contamination present in soil).
- #13 NEPC (2013) EIL - Commercial and Industrial. Value is for chromium III. Initial screening value applicable to all aged soils (see text).
- #14 NEPC (2013) EIL - Commercial and Industrial. Initial screening value applicable to all aged soils (see text).
- #15 NEPC (2013) EIL - Commercial and Industrial. Initial screening value applicable to all aged soils (see text).
- #16 NEPC (2013) ESL - Commercial and Industrial. Coarse soil value adopted for initial screening.
- #17 NEPC (2013) ESL - Commercial and Industrial. Fine soil value (most conservative) adopted for initial screening.
- #18 ESL for TRH F1 adopted for this historical fraction. Where F1 data are available, screening based on this fraction.
- #19 ESL for TRH >C10-C16 adopted for this historical fraction. Where >C10-C16 data are available, screening based on this fraction.
- #20 ESL for coarse soil adopted for initial screening.
- #21 NEPC (2013) ESL - Commercial and Industrial. Value applies to both coarse and fine soil.
- #22 NEPC (2013) EIL - Commercial and Industrial. Value applies to both fresh and aged contamination.

Table 4 - Groundwater Results vs Beneficial Use Objectives  
 Baseline Due Diligence Environmental Site Assessment  
 32-34 South Wharf, Port Melbourne  
 PoM  
 M17571



	Unit	EQL	Maintenance of Ecosystems - 95% Protection - Marine	Primary Contact Recreation	Location Code	MW7016	MW7018	QSO3	QSO4	MW7019	MW7020	MW7021
					Field ID	MW7016	MW7018	QSO3	QSO4	MW7019	MW7020	MW7021
					Date	9/10/2019	9/10/2019	9/10/2019	9/10/2019	10/10/2019	9/10/2019	9/10/2019
					Sample Type	Normal	Normal	Field_D	Interlab_D	Normal	Normal	Normal
Lab Report No.	EM1917008	EM1917008	EM1917008	682367	EM1917008	EM1917008	EM1917008					
<b>Physical Parameters</b>												
Total Dissolved Solids	mg/L	10		600 <sup>93</sup>	970	18,100	19,000	17,000	-	2,400	4,270	
pH (Lab)	pH Units	0.01		5.9 <sup>10</sup>	6.74	6.00	6.10	6.4	-	6.02	5.88	
<b>Inorganics</b>												
Ammonia (as N)	mg/L	0.01	0.91 <sup>11</sup>	0.4 <sup>11</sup>	0.02	0.64	0.67	0.52	3.29	1.89	0.19	
<b>Major Ions</b>												
Sulfate (as SO4) (filtered)	mg/L	1		250 <sup>12</sup>	121	1,440	1,550	1,600	-	270	835	
<b>Metals</b>												
Arsenic (filtered)	mg/L	0.001	0.0023 <sup>12</sup>	0.01 <sup>13</sup>	0.022	0.002	0.002	0.002	0.044	0.002	0.002	
Cadmium (filtered)	mg/L	0.0001	0.0007 <sup>13</sup>	0.002 <sup>13</sup>	<0.0001	<0.0001	<0.0001	<0.0002	0.0008	0.0001	<0.0001	
Chromium (filtered)	mg/L	0.001		0.05 <sup>14</sup>	0.001	0.002	0.002	0.002	0.062	0.002	0.002	
Copper (filtered)	mg/L	0.001	0.0013 <sup>14</sup>	1 <sup>15</sup>	0.002	0.040	0.037	0.031	0.004	0.011	0.007	
Lead (filtered)	mg/L	0.001	0.0044 <sup>14</sup>	0.01 <sup>13</sup>	<0.001	<0.001	<0.001	<0.001	0.048	<0.001	<0.001	
Mercury (filtered)	mg/L	0.0001	0.0001 <sup>13</sup>	0.001 <sup>13</sup>	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Nickel (filtered)	mg/L	0.001	0.007 <sup>13</sup>	0.02 <sup>13</sup>	0.012	0.062	0.060	0.052	0.058	0.024	0.030	
Zinc (filtered)	mg/L	0.005	0.015 <sup>14</sup>	3 <sup>16</sup>	0.030	0.202	0.198	0.16	1.15	0.084	0.072	
<b>BTEX</b>												
Benzene	µg/L	1	500 <sup>13</sup>	1 <sup>13</sup>	<1	<1	<1	<1	<1	<1	<1	
Toluene	µg/L	1	180 <sup>11</sup>	25 <sup>17</sup>	<2	<2	<2	<1	<1	<2	<2	
Ethylbenzene	µg/L	1	5 <sup>11</sup>	3 <sup>18</sup>	<2	<2	<2	<1	<1	<2	<2	
Xylene (m & p)	µg/L	1	75 <sup>15</sup>		<2	<2	<2	<2	<1	<2	<2	
Xylene (o)	µg/L	1	350 <sup>11</sup>		<2	<2	<2	<1	<1	<2	<2	
Total Xylene	µg/L	1		20 <sup>19</sup>	<2	<2	<2	<3	<1	<2	<2	
Total BTEX	µg/L	1			<1	<1	<1	-	<1	<1	<1	
<b>Total Petroleum Hydrocarbons</b>												
C6-C9 Fraction	µg/L	20			<20	<20	<20	<20	<20	<20	<20	
C10-C14 Fraction	µg/L	50			<50	<50	<50	<50	1,050	<50	<50	
C15-C28 Fraction	µg/L	100			<100	<100	<100	<100	1,320	<100	<100	
C29-C36 Fraction	µg/L	50			<50	<50	<50	<100	480	<50	<50	
C10-C36 Fraction (Sum)	µg/L	50			<50	<50	<50	<100	2,850	<50	<50	
<b>Total Recoverable Hydrocarbons</b>												
C6-C10 Fraction	µg/L	20			<20	<20	<20	<20	<20	<20	<20	
C6-C10 Fraction minus BTEX (F1)	µg/L	20	640 <sup>16</sup>	900 <sup>20</sup>	<20	<20	<20	<20	<20	<20	<20	
>C10-C16 Fraction	µg/L	50			<100	<100	<100	<50	1,310	<100	<100	
>C10-C16 Fraction minus naphthalene (F2)	µg/L	50	640 <sup>16</sup>	900 <sup>20</sup>	<100	<100	<100	<50	1,310	<100	<100	
>C16-C34 Fraction	µg/L	100	640 <sup>17</sup>	900 <sup>20</sup>	<100	<100	<100	<100	1,320	<100	<100	
>C34-C40 Fraction	µg/L	100	640 <sup>18</sup>	900 <sup>20</sup>	<100	<100	<100	<100	230	<100	<100	
>C10-C40 Fraction (Sum)	µg/L	100			<100	<100	<100	<100	2,860	<100	<100	
<b>PAHs</b>												
Naphthalene	µg/L	5	50 <sup>13</sup>	70 <sup>21</sup>	<5	<5	<5	<10	<5	<5	<5	
<b>Volatile Organic Compounds</b>												
Trihalomethanes	µg/L	1		250 <sup>13</sup>	-	-	-	-	<1	-	-	
<b>MAH</b>												
1,2,4-Trimethylbenzene	mg/L	0.001		0.056 <sup>22</sup>	<0.005	<0.005	<0.005	<0.001	<0.001	<0.005	<0.005	
1,3,5-Trimethylbenzene	mg/L	0.001		0.06 <sup>22</sup>	<0.005	<0.005	<0.005	<0.001	<0.001	<0.005	<0.005	
Isopropylbenzene	mg/L	0.001	0.03 <sup>11</sup>	0.45 <sup>22</sup>	<0.005	<0.005	<0.005	<0.001	<0.001	<0.005	<0.005	
n-Butylbenzene	mg/L	0.001		1 <sup>22</sup>	<0.005	<0.005	<0.005	-	<0.001	<0.005	<0.005	
n-Propylbenzene	mg/L	0.001		0.56 <sup>22</sup>	<0.005	<0.005	<0.005	-	<0.001	<0.005	<0.005	
p-Isopropyltoluene	mg/L	0.001		0.56 <sup>22</sup>	<0.005	<0.005	<0.005	-	0.087	<0.005	<0.005	
sec-Butylbenzene	mg/L	0.001		2 <sup>22</sup>	<0.005	<0.005	<0.005	-	<0.001	<0.005	<0.005	
tert-Butylbenzene	mg/L	0.001		0.69 <sup>22</sup>	<0.005	<0.005	<0.005	-	<0.001	<0.005	<0.005	
Styrene	mg/L	0.001		0.004 <sup>23</sup>	<0.005	<0.005	<0.005	<0.001	<0.001	<0.005	<0.005	
Total Monocyclic Aromatic Hydrocarbons	mg/L	0.003			<0.005	<0.005	<0.005	<0.003	-	<0.005	<0.005	
<b>Halogenated Benzenes</b>												
1,2,3-Trichlorobenzene	µg/L	1	3 <sup>11</sup>	5 <sup>24</sup>	<5	<5	<5	-	<1	<5	<5	
1,2-Dichlorobenzene	µg/L	1	160 <sup>11</sup>	1 <sup>25</sup>	<5	<5	<5	<1	<1	<5	<5	
1,2,4-Trichlorobenzene	µg/L	1	20 <sup>13</sup>	5 <sup>24</sup>	<5	<5	<5	-	<1	<5	<5	
1,3-Dichlorobenzene	µg/L	1	260 <sup>11</sup>		<5	<5	<5	<1	<1	<5	<5	
2-Chlorotoluene	µg/L	1		240 <sup>22</sup>	<5	<5	<5	<1	<1	<5	<5	
1,4-Dichlorobenzene	µg/L	0.1	60 <sup>11</sup>	0.3 <sup>26</sup>	<5	<5	<5	<1	0.1	<5	<5	
4-Chlorotoluene	µg/L	1		250 <sup>22</sup>	<5	<5	<5	<1	<1	<5	<5	
Bromobenzene	µg/L	1		62 <sup>22</sup>	<5	<5	<5	<1	<1	<5	<5	
Chlorobenzene	µg/L	1	55 <sup>11</sup>	10 <sup>18</sup>	<5	<5	<5	<1	4	<5	<5	
Total Trichlorobenzene	µg/L	1		5 <sup>24</sup>	-	-	-	-	<1	-	-	
<b>Halogenated Hydrocarbons</b>												
1,2-Dibromoethane	µg/L	1		1 <sup>13</sup>	<5	<5	<5	<1	<1	<5	<5	
Bromomethane	µg/L	1		1 <sup>13</sup>	<50	<50	<50	<1	<10	<50	<50	
Dichlorodifluoromethane	µg/L	1		200 <sup>22</sup>	<50	<50	<50	<1	<10	<50	<50	
Iodomethane	µg/L	1			<5	<5	<5	<1	<1	<5	<5	
Trichlorofluoromethane	µg/L	1		5,200 <sup>22</sup>	<50	<50	<50	<1	<10	<50	<50	
<b>Chlorinated Hydrocarbons</b>												
1,1-Dichloroethane	µg/L	1			<5	<5	<5	-	<1	<5	<5	
1,1-Dichloroethane	µg/L	1	250 <sup>11</sup>	2.8 <sup>22</sup>	<5	<5	<5	<1	1	<5	<5	
1,1-Dichloroethane	µg/L	1	700 <sup>11</sup>	30 <sup>13</sup>	<5	<5	<5	<1	<1	<5	<5	
1,1,1,2-Tetrachloroethane	µg/L	1		0.57 <sup>22</sup>	<5	<5	<5	<1	<1	<5	<5	
1,1,1-Trichloroethane	µg/L	1	270 <sup>11</sup>	8,000 <sup>22</sup>	<5	<5	<5	<1	<1	<5	<5	
1,2-Dibromo-3-chloropropane	µg/L	1		1 <sup>27</sup>	<5	<5	<5	-	<1	<5	<5	
1,1,2-Trichloroethane	µg/L	1	1,900 <sup>14</sup>	0.28 <sup>22</sup>	<5	<5	<5	<1	<1	<5	<5	
1,1,2,2-Tetrachloroethane	µg/L	1	400 <sup>11</sup>	0.076 <sup>22</sup>	<5	<5	<5	<1	<1	<5	<5	
1,2,3-Trichloropropane	µg/L	1		0.00075 <sup>22</sup>	<5	<5	<5	<1	<1	<5	<5	
1,2-Dichloroethane	µg/L	1	1,900 <sup>11</sup>	3 <sup>13</sup>	<5	<5	<5	<1	<1	<5	<5	
1,3-Dichloropropane	µg/L	1	700 <sup>11</sup>	370 <sup>22</sup>	<5	<5	<5	<1	<1	<5	<5	
1,2-Dichloropropane	µg/L	1	600 <sup>11</sup>	40 <sup>28</sup>	<5	<5	<5	<1	<1	<5	<5	
2,2-Dichloropropane	µg/L	1			<5	<5	<5	-	<1	<5	<5	
Bromochloromethane	µg/L	1		83 <sup>22</sup>	-	-	-	<1	<1	-	-	
Bromodichloromethane	µg/L	1		250 <sup>13</sup>	<5	<5	<5	<1	<1	<5	<5	
Bromoform	µg/L	1		250 <sup>13</sup>	<5	<5	<5	<1	<1	<5	<5	
Carbon Tetrachloride	µg/L	1	240 <sup>11</sup>	3 <sup>13</sup>	<5	<5	<5	<1	<1	<5	<5	
Chlorodibromomethane	µg/L	1		250 <sup>13</sup>	<5	<5	<5	<1	<1	<5	<5	
Chloroethane	µg/L	1		21,000 <sup>22</sup>	<50	<50	<50	<1	<10	<50	<50	
Chloroform	µg/L	1	370 <sup>11</sup>	250 <sup>13</sup>	<5	<5	<5	<5	<1	<5	<5	
Chloromethane	µg/L	1		190 <sup>22</sup>	<50	<50	<50	<1	<10	<50	<50	
cis-1,4-Dichloro-2-butene	µg/L	1		0.0013 <sup>22</sup>	<5	<5	<5	-	<1	<5	<5	
cis-1,2-Dichloroethene	µg/L	1		60 <sup>25</sup>	<5	<5	<5	<1	1	<5	<5	
Dibromomethane	µg/L	1		8.3 <sup>25</sup>	<5	<5	<5	<1	<1	<5	<5	
cis-1,3-Dichloropropene	µg/L	1			<5	<5	<5	<1	<2	<5	<5	
1,3-Dichloropropene	µg/L	2	0.8 <sup>11</sup>	100 <sup>13</sup>	-	-	-	-	<2	-	-	
Dichloromethane	µg/L	1	3,000 <sup>11</sup>	4 <sup>13</sup>	-	-	-	<				

<b>Location Code</b>	MW7016	MW7018			MW7019	MW7020	MW7021
<b>Field ID</b>	MW7016	MW7018	QS03	QS04	MW7019	MW7020	MW7021
<b>Date</b>	9/10/2019	9/10/2019	9/10/2019	9/10/2019	10/10/2019	9/10/2019	9/10/2019
<b>Sample Type</b>	Normal	Normal	Field_D	Interlab_D	Normal	Normal	Normal
<b>Lab Report No.</b>	EM1917008	EM1917008	EM1917008	682367	EM1917008	EM1917008	EM1917008

	Unit	EQL	Maintenance of Ecosystems - 95% Protection - Marine	Primary Contact Recreation	
--	------	-----	---	----------------------------	--

**Comments**

- #1 ANZECC/ARMCANZ 2000 (Low Reliability Values): marine
- #2 ANZECC/ARMCANZ 2000 (Low Reliability Values): marine. The more conservative value (As III) out of the available values for arsenic species (III and V) was adopted for initial screening purposes.
- #3 ANZECC/ARMCANZ 2000 (Protection 95%): marine adopted for chemicals that bioaccumulate.
- #4 ANZECC/ARMCANZ 2000 (Protection 95%): marine
- #5 ANZECC/ARMCANZ 2000 (Low Reliability Values): marine for m-xylene conservatively adopted as the lowest of those available for m- and p-xylene.
- #6 CRWB (2019). Lowest of values for gasoline (C4-C12) and diesel (C8-C21) range hydrocarbons.
- #7 CRWB (2019). Value for diesel (C8-C21) mixture.
- #8 CRWB (2019). Value for diesel (C8-C21) mixture. No value derived for TPH >C21 as not considered soluble; diesel value used for screening.
- #9 NHMRC (2011) - Aesthetic. Value based on taste, for 'good quality' drinking water. Higher levels (up to 1,200) may be acceptable. No health based value has been set
- #10 ANZECC/ARMCANZ 2000
- #11 NHMRC (2011) - Aesthetic. Based on corrosion of copper pipes/fittings. Converted from guideline for ammonia (as NH3). No health based value has been set
- #12 NHMRC (2011) - Aesthetic. Taste threshold. Health based value is 500 mg/L
- #13 NHMRC (2011) - Health
- #14 NHMRC (2011) - Health. Guideline for Cr (VI) conservatively adopted for comparison to total chromium. Speciated analysis should be undertaken where guideline is exceeded.
- #15 NHMRC (2011) - Aesthetic. Health based value is 2 mg/L
- #16 NHMRC (2011) - Aesthetic. Taste threshold. No health based value has been derived (zinc is an essential element for humans).
- #17 NHMRC (2011) - Aesthetic. Taste/odour threshold. Health based value is 0.8 mg/L
- #18 NHMRC (2011) - Aesthetic. Taste/odour threshold. Health based value is 0.3 mg/L
- #19 NHMRC (2011) - Aesthetic. Taste/odour threshold. Health based value is 0.6 mg/L
- #20 WHO (2008). Lowest of derived values for aliphatic and aromatic fractions in this range, multiplied by 10 as per NHMRC (2008). May not protect aesthetic quality, to be used in conjunction with sensory assessment for taste and odour.
- #21 NHMRC (2011) - Health. Derived as per NHMRC (2011) based on TDI used for NEPM HSL derivation.
- #22 USEPA RSLs (November 2018 Update) - Tap Water
- #23 NHMRC (2011) - Aesthetic. Odour threshold. Health based value is 0.03 mg/L
- #24 NHMRC (2011) - Aesthetic. Taste/odour threshold. Health based value is 0.03 mg/L
- #25 NHMRC (2011) - Aesthetic. Taste/odour threshold. Health based value is 1.5 mg/L
- #26 NHMRC (2011) - Aesthetic. Taste/odour threshold. Health based value is 0.04 mg/L
- #27 WHO (2011)
- #28 WHO (2011). Provisional guideline due to uncertainties in the health database
- #29 NHMRC (2011) - Health. Value is for total 1,2-DCE but also applied to individual isomers.
- #30 WHO (2011). Provisional guideline due to uncertainties in the database



## Appendix A: Site Photographs



**Photo 1. Fly Ash Bulk Storage and Silo.**



**Photo 2. Truck Maintenance Area.**



**Photo 3. Workshop Area.**



**Photo 4. Disused AST.**



**Photo 5. Oil Water Storage.**



**Photo 6. Truck Loading Area**



Photo 7. SB7375 Soil Bore Location



Photo 8. SB7375 Lithology



**Photo 9. SB7375 Soil Bore Reinstation**



**Photo 10. SB7376 Soil Bore Location**



Photo 11. SB7376 Lithology



Photo 12. SB7376 Reinstation



**Photo 13. SB7377 Soil Bore Location**



**Photo 14. SB7377 Lithology. Depth profile from right to left.**



**Photo 15.: SB7377 Soil Bore Reinstation.**



**Photo 16. SB7378 Soil Bore Location.**



**Photo 17. SB7378 Lithology. Depth profile from bottom left to top right.**



**Photo 18. SB7378 Soil Bore Reinstation.**



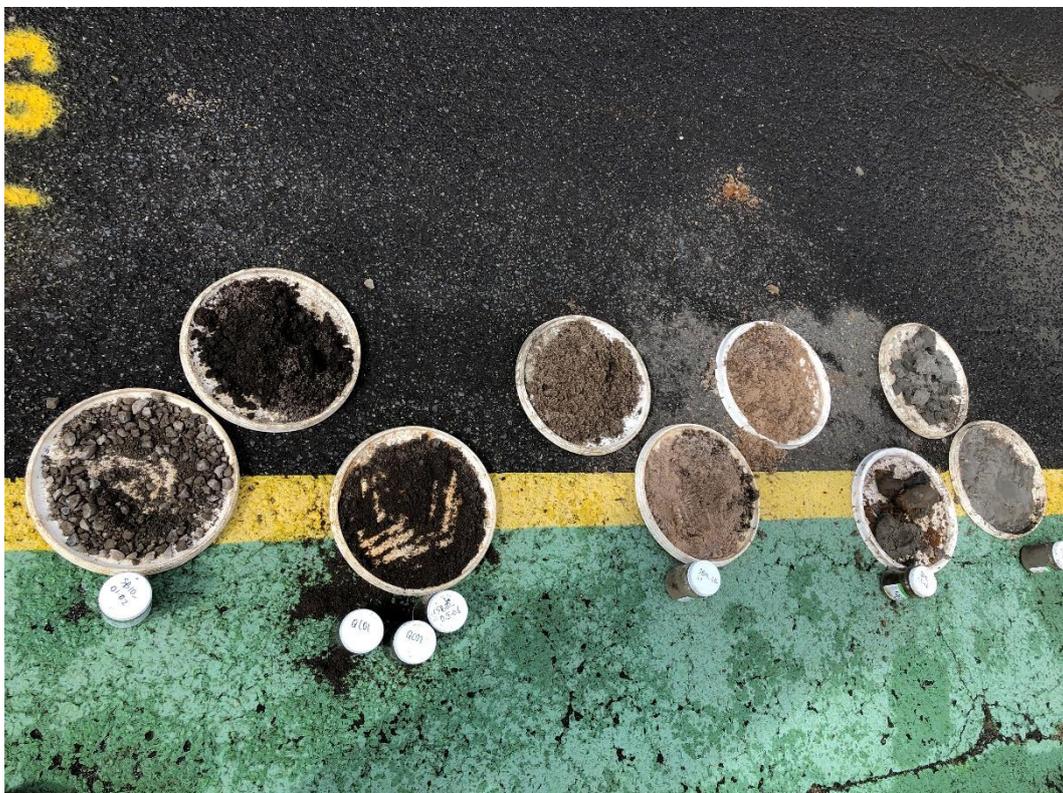
**Photo 19. SB7379 Soil Bore Location.**



**Photo 20. SB7379 Lithology. Depth profile from bottom left to bottom right.**



**Photo 21. SB7380 Soil Bore Location.**



**Photo 22. SB7380 Lithology**



**Photo 23. Water being added to a cement truck within a dedicated bay at 32 South Wharf.**



**Photo 24. Watering bay at 32 South Wharf**



**Photo 25. View east across 32 South Wharf showing product hoppers at the eastern site boundary.**



**Photo 26. Office building and sheds at 32 South Wharf.**



**Photo 27. View south across 34 South Wharf.**



**Photo 28. Location SB7381 near northwest corner of 34 South Wharf.**



## Appendix B: Groundwater Purge Sheets



**Groundwater Sampling and Field Chemical Characteristics Record**

Site and Job Number					Well Information										
Job Number:	M17571				Well ID:	MW7075			Gatic Type (old, new):	-					
Project Name:	Due Diligence Lease Investigation				Well Construction (flush, stickup):	Flush			Well Diameter (mm):	50					
Client:	Port of Melbourne				Surface Casing Height (m bgl):	~ - 0.2			Key Type (e.g. 8mm gatic):	n/a					
Location:	32-34 South Wharf, Port Melbourne				Survey Mark Present?:	Yes			Well Condition:	Poor					
Well Gauging					Well Purging										
Date:	9/10/2019	Time:	10:30 AM		Probe Type & ID No.	-				Date:	9/10/2019	Start	10:30 AM	Finish	7:50 AM
Depth to Product:	-	m bTOC	-		Product Thickness (m):	-				Method (bailer, low flow, other):	Low flow/ bailer			Depth to Water with Pump:	1.645
Depth to Water:	1.642	m bTOC	-		Product Description:	-				Depth (pump intake setting bTOC):	2.5 - 3			Sediment Thickness in Well (m)	-
Total Depth of Well:	3.64	m bTOC	-		Product Confirmed by Bailer:	N/A				Total Volume Purged (L):#	-			Screen Interval (m bgl):	-
Field Chemistry											Observations				
Time	Pump Rate	Refill / Discharge	Volume (L)	WL (m bTOC)	DO (mg/L)** ±10% * ^	EC (µS/cm) ±3% *	pH ±0.05 *	Redox (mV) ±10mV *	Temp (°C) ±10% *	Turbidity	Colour	Odour	Sheen		
10:30 AM	CPM3	13:7	0.4	1.64	6.23	951	6.2	105.6	15.4	Non-turbid	brown	no odour	no sheen		
10:32 AM	CPM3	13:7	0.8	1.75	5.98	485.7	5.91	12.5	15.3	Non-turbid	brown	no odour	no sheen		
10:35 AM	CPM2	27:3	1.2	1.85	4.41	949	5.72	130.7	15.1	Non-turbid	brown	no odour	no sheen		
10:38 AM	CPM1	57:3	1.6	2	4.2	950	5.67	139.9	15	Non-turbid	brown	no odour	no sheen		
10:41 AM	CPM1	57:3	2	2.2	5.25	483	5.65	158.8	14.7	Non-turbid	brown	no odour	no sheen		
10:45 AM	CPM1	57:3	2.4	2.4	3.22	949	5.67	147.4	14.3	Non-turbid	brown	no odour	no sheen		
10:51 AM	CPM1	57:3	2.8	2.9	3.15	952	5.65	156.7	14.5	Non-turbid	brown	no odour	no sheen		
11:00 AM	-	-	8	3.6	-	-	-	-	-						
10/10/2019															
7:50 AM	Bailer	-	-	2.022	4.2	639	6.64	128.5	15.4	Non-turbid	brown	no odour	no sheen		
Sampling					Purging / Sampling Comments										
Date	10/10/2019	Start	7:55 AM		Finish	8:10 AM				Recharge Ability:	Poor <0.1L/min			Other Comments:	
Sampling Method (bailer, low flow, other):	Bailer				Air Bubbles in Vials?	No				Micropurged initially but excessive drawdown so bailed dry and sampled on the following day.					
SWL at end of Sampling:	- m bTOC				Reaction with Preservatives?	No				No gatic present just a gatic lid placed over the casing.					
Sample No:	Container	No. Samples	Container	No. Samples	QA QC	Laboratory	Headspace PID Readings:	N/A							
MW7075	Inorganics	1	Pres Inorganics (Filt.)	1	Y <sup>n</sup> N <sup>a</sup>	ALS	Any Odours During Sampling?	no odour							
	Metals (Filtered)	1	Metals	1	Y <sup>n</sup> N <sup>a</sup>		Purge Volume (if required):	-							
	VOC (H2SO4)	2	SVOCs	1	Y <sup>n</sup> N <sup>a</sup>		# Purge Volume = [TD (mbTOC)-SWL (mbTOC)] x [(D (mm))/2] <sup>2</sup> x 0.00314 (only relevant non-low flow methods)								
Total Containers	7				Waste Disposal:	Drums				* Parameters considered stable when three consecutive readings three to five minutes apart are all within stated criteria (EPA Pub 669)					
Authorisation															
Sampled By:	S.O'Connor	Signature:				** If using galvanic DO probe (yellow cap), highest DO reading during discharge should be recorded.									
Checked By:	M Hunt	Signature:				^ Or sensor accuracy, whichever is greater. YSI ProPlus sensor accuracy is 0.2 mg/L.									















## Appendix C: Calibration Certificates

# Instrument Quality Report Interface Meter



**Enqip #:** 10180  
**Company:** Senversa  
**Consultant:** Matthew Hunt  
**PO #:** M17571  
**Certificate #:** 14410

## INSTRUMENT IDENTIFICATION

**Instrument Type:** Solinst Interface Meter  
**Model Number:** 122  
**Serial Number:** 311998

## INSPECTION RECORD

<b>Battery:</b>	PASS	<b>Water Tone:</b>	PASS
<b>Tape Condition:</b>	PASS	<b>Hydrocarbon Tone:</b>	PASS

**Tested By:** Darrin Arthur

**Test Date:** 8/10/2019



116 Thistlethwaite St, South Melbourne 3205

P 1300 218 987

E [info@enqip.com.au](mailto:info@enqip.com.au) | W [www.enqip.com.au](http://www.enqip.com.au)

# Equipment Calibration Form

## RKI GX-6000 PID



**Enqip #:** 10180  
**Company:** Senversa  
**Consultant:** Matthew Hunt  
**PO #:** M17571  
**Certificate #:** 14411

### INSTRUMENT IDENTIFICATION

**Model Number:** GX-6000  
**Serial Number:** 5210153201-5RN

### INSPECTION RECORD

**Flow Rate:** PASS      **Inlet Filter:** PASS  
**Buzzer:** PASS      **Date & Time:** PASS

### CALIBRATION DETAILS

Parameters	Standard	Result
Air	0.0 ppm	0.0 ppm
Isobutylene	100.0 ppm	100.0 ppm

**Calibration Successful:** YES

**Calibrated By:** Doyle Schapendonk

**Test Date:** 8/10/2019



116 Thistlethwaite St, South Melbourne 3205

P 1300 218 987

E info@enqip.com.au | W www.enqip.com.au

# Equipment Calibration Form

## YSI ProPlus



**Enqip #:** 10180  
**Company:** Senversa  
**Consultant:** Matthew Hunt  
**PO #:** M17571  
**Certificate #:** 14409

### INSTRUMENT IDENTIFICATION

**Model Number:** 6050000  
**Serial Number:** 18L105008  
**Instrument Type:** YSI ProPlus

### INSPECTION RECORD

**Batteries Checked:** PASS      **Date & Time:** PASS  
**Electrodes Cleaned/Checked:** PASS      **Temperature:** PASS

### CALIBRATION DETAILS

Sensor	Cal Solution	Value	Reading
pH	Buffer 4.00	4.00 pH	4.01 pH
	Buffer 7.00	7.00 pH	7.00 pH
Redox	Standard ORP	241 mV @ 15 °C	241 mV
O <sub>2</sub>	Zero Dissolved Oxygen	0.0 %	0.0 %
	Air	100.0 %	100.0 %
Conductivity	Standard Conductivity	2.76 mS/cm	2.76 mS/cm

**Calibration Successful:** YES

**Calibrated By:** Doyle Schapendonk

**Test Date:** 8/10/2019



116 Thistlethwaite St, South Melbourne 3205  
P 1300 218 987

E info@enqip.com.au | W www.enqip.com.au

**PID Calibration Certificate**



Instrument **PhoCheck Tiger**  
 Serial No. **T-113955**

Air-Met Scientific Pty Ltd  
 1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 ev			
Alarms	Beeper	✓	Low	High	TWA	STEL
	Settings	✓	50ppm	100ppm		
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

**Certificate of Calibration**

This is to certify that the above instrument has been calibrated to the following specifications:

Diffusion mode      Aspirated mode

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No	Instrument Reading
PID Lamp		96ppm Isobutylene	NIST	ME468	96ppm Isobutylene

**Calibrated by:** \_\_\_\_\_ **David Trengove**

**Calibration date:**                      **18/11/2019**

**Next calibration due:**                      **16/05/2020**



## Appendix D: Bore Logs



PROJECT NAME Due Diligence Site Assessmet

PROJECT NUMBER M17571

PROJECT LOCATION Wharf 33

DATE STARTED 9/10/19 COMPLETED 9/10/19 LOGGED BY MH CHECKED BY SI

CONTRACTOR USD LOCATION (Easting, Northing, Zone) Wharf 33, Lorimer Street, Port Melbourne

EQUIPMENT CC, HA, NDD DIMENSIONS 120 mm INCLINATION Vertical

GROUNDWATER NOTES - CASING LEVEL - SURFACE LEVEL -

GENERAL NOTES

DRILLING					FIELD MATERIAL DESCRIPTION			SAMPLING			
Method	Core Recovery (%)	Water	Well Details	Depth (m)	Graphic Log	Classification Symbol	Material Description	Additional Observations	PID (ppm)	Sample ID & Interval (QA/QC)	
CC						ASPHALT	ASPHALT, Good condition, 50mm.	No odour or staining.			
						FILL	FILL, Sandy GRAVEL, fine to coarse grained, well graded, sub-angular gravel, fine to coarse grained, well graded, sub-rounded sand, grey, very dense, dry. (Cement stabilised crushed rock).				
CB / NDD				0.5		FILL	FILL, SAND, fine to medium grained, poorly graded, sub-rounded sand, yellow, very loose, dry.			0.1	SB7375_0.50 - 0.60 QC05/06
HA						FILL	FILL, Gravelly SAND, fine to medium grained, poorly graded, sub-rounded sand, fine to coarse grained, well graded, sub-angular gravel, grey, dense, dry.			0.3	SB7375_0.90 - 1.00
				1.0		FILL	FILL, SAND, fine to medium grained, poorly graded, sub-rounded sand, yellow, dense, dry.			0.2	SB7375_1.50 - 1.60
HA / NDD				1.5		FILL	FILL, SAND, fine to medium grained, poorly graded, sub-rounded sand, yellow, dense, dry.				
				2.0		SP	SAND, fine to medium grained, poorly graded, sub-rounded sand, yellow grey, dense, dry.		0.1	SB7375_1.90 - 2.00	
							SB7375 terminated at 2.00 m bgl Target depth reached.				
				2.5							

1. SENVERSA STANDARD M17571.GPJ SENVERSA\_GINT.GDT 18/11/19



PROJECT NAME Due Diligence Site Assessmet

PROJECT NUMBER M17571

PROJECT LOCATION Wharf 33

DATE STARTED 9/10/19 COMPLETED 9/10/19 LOGGED BY MH CHECKED BY SI

CONTRACTOR USD LOCATION (Easting, Northing, Zone) Wharf 33, Lorimer Street, Port Melbourne

EQUIPMENT CC, HA, NDD DIMENSIONS 120 mm INCLINATION Vertical

GROUNDWATER NOTES - CASING LEVEL - SURFACE LEVEL -

GENERAL NOTES

DRILLING						FIELD MATERIAL DESCRIPTION			SAMPLING	
Method	Core Recovery (%)	Water	Well Details	Depth (m)	Graphic Log	Classification Symbol	Material Description	Additional Observations	PID (ppm)	Sample ID & Interval (QA/QC)
CC						ASPHALT	ASPHALT, Good condition, 50mm.			
HA / NDD						FILL	FILL, Gravelly SAND, fine to coarse grained, well graded, sub-rounded sand, fine to coarse grained, well graded, sub-angular gravel, grey, dense, dry.		0.6	SB7376_0.10 - 0.20
HA				0.5		FILL	FILL, SAND, fine to medium grained, poorly graded, sub-rounded sand, trace low plasticity clay, trace rootlets, dark grey, loose, dry.		0.5	SB7376_0.50 - 0.60
NDD										
HA				1.0		SP	SAND, medium grained, poorly graded, rounded sand, grey, very loose, dry.	No odour or staining.	0.3	SB7376_1.00 - 1.10
						SP	SAND, fine to medium grained, poorly graded, sub-rounded sand, grey brown, loose, dry.			
						SP	SAND, coarse grained, poorly graded, sub-rounded sand, brown and grey, very loose, dry.			
				1.5		SM	Silty SAND, fine grained, poorly graded, rounded sand, trace clay, grey, loose, moist.		0.6	SB7376_1.50 - 1.60
							Fine grained, poorly graded, rounded sand, trace roots.			
				2.0					0.3	SB7376_1.90 - 2.00
							SB7376 terminated at 2.00 m bgl Target depth reached.			
				2.5						

1. SENVERSA STANDARD M17571.GPJ SENVERSA\_GINT.GDT 18/11/19



PROJECT NAME Due Diligence Site Assessmet

PROJECT NUMBER M17571

PROJECT LOCATION Wharf 33

DATE STARTED 9/10/19 COMPLETED 9/10/19 LOGGED BY MH CHECKED BY SI

CONTRACTOR USD LOCATION (Easting, Northing, Zone) Wharf 33, Lorimer Street, Port Melbourne

EQUIPMENT CC, HA, NDD DIMENSIONS 120 mm INCLINATION Vertical

GROUNDWATER NOTES - CASING LEVEL - SURFACE LEVEL -

GENERAL NOTES

DRILLING						FIELD MATERIAL DESCRIPTION			SAMPLING	
Method	Core Recovery (%)	Water	Well Details	Depth (m)	Graphic Log	Classification Symbol	Material Description	Additional Observations	PID (ppm)	Sample ID & Interval (QA/QC)
CC						ASPHALT	ASPHALT, Good condition, 50mm.			
HA / NDD						FILL	FILL, Gravelly SAND, fine to coarse grained, well graded, sub-rounded sand, fine to coarse grained, well graded, sub-angular gravel, grey, dense, dry.		0.3	SB7377_0.10 - 0.20
HA				0.5		FILL	FILL, Clayey SAND, fine to medium grained, poorly graded, sub-rounded sand, trace fine to medium grained, poorly graded, sub-angular gravel, dark grey, loose, dry.		0.2	SB7377_0.50 - 0.60
				1.0		SP	SAND, fine to medium grained, poorly graded, sub-rounded sand, pale grey, loose, dry.			
							Trace orange mottling.	No odour or staining.	0.2	SB7377_1.00 - 1.10
							Orange brown.			
				1.5		SM	Silty SAND, fine grained, poorly graded, rounded sand, pale yellow, loose, moist.		0.3	SB7377_1.50 - 1.60
						SM	Trace low plasticity clay, mottled orange and grey.			
						SP	SAND, coarse grained, poorly graded, rounded sand, orange and grey, loose, moist.			
				2.0					0.2	SB7377_1.90 - 2.00
							SB7377 terminated at 2.00 m bgl Target depth reached.			
				2.5						

1. SENVERSA STANDARD M17571.GPJ SENVERSA\_GINT.GDT 18/11/19



PROJECT NAME Due Diligence Site Assessmet

PROJECT NUMBER M17571

PROJECT LOCATION Wharf 33

DATE STARTED 9/10/19 COMPLETED 9/10/19 LOGGED BY MH CHECKED BY SI

CONTRACTOR USD LOCATION (Easting, Northing, Zone) Wharf 33, Lorimer Street, Port Melbourne

EQUIPMENT CC, HA, NDD DIMENSIONS 120 mm INCLINATION Vertical

GROUNDWATER NOTES 1.8m CASING LEVEL - SURFACE LEVEL -

GENERAL NOTES

DRILLING					FIELD MATERIAL DESCRIPTION			SAMPLING		
Method	Core Recovery (%)	Water	Well Details	Depth (m)	Graphic Log	Classification Symbol	Material Description	Additional Observations	PID (ppm)	Sample ID & Interval (QA/QC)
CC						ASPHALT	ASPHALT, Good condition, 50mm.			
HA / NDD						FILL	FILL, SAND, fine to medium grained, poorly graded, sub-rounded sand, minor fine to medium grained, poorly graded, sub-angular gravel, grey, loose, dry.		0.3	SB7378_0.10 - 0.20
HA				0.5			Trace fine to medium grained, poorly graded, sub-angular gravel, trace low plasticity clay, dark grey.			
						FILL	FILL, SAND, fine grained, poorly graded, rounded sand, trace low plasticity clay, dark grey, very loose, dry.		0.3	SB7378_0.50 - 0.60
				1.0			Fine to medium grained, poorly graded, sub-rounded sand, pale grey, very loose, dry.	No odour or staining.	0.2	SB7378_1.00 - 1.10
				1.5			Becoming orange brown.			
						SP	SAND, fine to medium grained, poorly graded, sub-rounded sand, orange brown, very loose, dry.		0.3	SB7378_1.50 - 1.60
				2.0		SP	SAND, fine to medium grained, poorly graded, sub-rounded sand, trace silt, grey, loose, dry.		0.4	SB7378_1.90 - 2.00
				2.5			SB7378 terminated at 2.00 m bgl Target depth reached.			

1. SENVERSA STANDARD M17571.GPJ SENVERSA\_GINT.GDT 18/11/19



PROJECT NAME Due Diligence Site Assessmet

PROJECT NUMBER M17571

PROJECT LOCATION Wharf 33

DATE STARTED 9/10/19

COMPLETED 9/10/19

LOGGED BY MH

CHECKED BY SI

CONTRACTOR USD

LOCATION (Easting, Northing, Zone) Wharf 33, Lorimer Street, Port Melbourne

EQUIPMENT CC, HA, NDD

DIMENSIONS 120 mm

INCLINATION Vertical

GROUNDWATER NOTES -

CASING LEVEL -

SURFACE LEVEL -

GENERAL NOTES

DRILLING						FIELD MATERIAL DESCRIPTION			SAMPLING	
Method	Core Recovery (%)	Water	Well Details	Depth (m)	Graphic Log	Classification Symbol	Material Description	Additional Observations	PID (ppm)	Sample ID & Interval (QA/QC)
CC						ASPHALT	ASPHALT, Good condition, 50mm.			
HA / NDD						FILL	FILL, Gravelly SAND, fine to coarse grained, well graded, sub-rounded sand, fine to coarse grained, well graded, sub-angular gravel, grey, dense, dry.	No odour or staining.	0.1	SB7379_0.10 - 0.20
						FILL	FILL, Sandy GRAVEL, fine to coarse grained, well graded, sub-angular gravel, fine to coarse grained, well graded, sub-rounded sand, grey, loose, dry.		0.1	SB7379_0.50 - 0.60
									0.1	SB7379_1.00 - 1.10
									0.1	SB7379_1.50 - 1.60
				1.5		FILL	FILL, Gravelly SAND, fine to coarse grained, well graded, sub-rounded sand, fine to coarse grained, well graded, sub-angular gravel, grey, dense, dry.			
				2.0		SP	SAND, fine to medium grained, poorly graded, sub-rounded sand, trace silt, light grey to grey, very loose, dry.		0.3	SB7379_2.00 - 2.10
							SB7379 terminated at 2.20 m bgl Target depth reached.			
				2.5						

1. SENVERSA STANDARD M17571.GPJ SENVERSA\_GINT.GDT 18/11/19

PROJECT NAME Due Diligence Site Assessmet

PROJECT NUMBER M17571

PROJECT LOCATION Wharf 33

DATE STARTED 9/10/19

COMPLETED 9/10/19

LOGGED BY MH

CHECKED BY SI

CONTRACTOR USD

LOCATION (Easting, Northing, Zone) Wharf 33, Lorimer Street, Port Melbourne

EQUIPMENT CC, HA, NDD

DIMENSIONS 120 mm

INCLINATION Vertical

GROUNDWATER NOTES 1.4m

CASING LEVEL -

SURFACE LEVEL -

GENERAL NOTES

DRILLING					FIELD MATERIAL DESCRIPTION			SAMPLING		
Method	Core Recovery (%)	Water	Well Details	Depth (m)	Graphic Log	Classification Symbol	Material Description	Additional Observations	PID (ppm)	Sample ID & Interval (QA/QC)
CC						ASPHALT	ASPHALT, Good condition, 50mm.			
HA / NDD						FILL	FILL, Sandy GRAVEL, medium to coarse grained, poorly graded, sub-angular gravel, fine to medium grained, poorly graded, sub-rounded sand, grey, dense, dry.		0	SB7380_0.10 - 0.20
HA				0.5		FILL	FILL, SAND, fine to medium grained, poorly graded, sub-rounded sand, trace medium grained, poorly graded, sub-angular gravel, dark grey, loose, dry. Anthropogenic material including trace gasworks waste.		0.6	SB7380_0.50 - 0.60 QC01/02
							No gravel, becoming light grey.			
				1.0		SP	SAND, fine to medium grained, poorly graded, sub-rounded sand, light grey, very loose, dry.	No odour or staining.	0.3	SB7380_1.00 - 1.10
				1.5		CH	Silty CLAY, high plasticity, orange brown mottling, soft, moist, wet of plastic limit.		0.3	SB7380_1.50 - 1.60
				2.0		SM	Silty SAND, fine grained, poorly graded, rounded sand, minor high plasticity clay, grey, loose, wet.		0.4	SB7380_1.90 - 2.00
				2.5			SB7380 terminated at 2.00 m bgl Target depth reached.			

1. SENVERSA STANDARD M17571.GPJ SENVERSA\_GINT.GDT 18/11/19



PROJECT NAME Due Diligence Site Assessmet

PROJECT NUMBER M17571

PROJECT LOCATION 32-34 South Wharf, Lorimer Street, Port Melbourne

DATE STARTED 19/11/19

COMPLETED 19/11/19

LOGGED BY SO

CHECKED BY SI

CONTRACTOR Qest

LOCATION (Easting, Northing, Zone)

EQUIPMENT HA, NDD

DIMENSIONS 120 mm

INCLINATION Vertical

GROUNDWATER NOTES -

CASING LEVEL -

SURFACE LEVEL -

GENERAL NOTES

DRILLING						FIELD MATERIAL DESCRIPTION			SAMPLING	
Method	Core Recovery (%)	Water	Well Details	Depth (m)	Graphic Log	Classification Symbol	Material Description	Additional Observations	PID (ppm)	Sample ID & Interval (QA/QC)
HA / NDD				0.5		FILL	FILL: Gravelly Silt, non-plastic, fine to medium grained, poorly graded, sub-rounded to sub-angular gravel, minor clay, minor sand and minor organics, loose, brown, moist, dry of plastic limit. Anthropogenic material included concrete pieces.		0.0	SB7381_0.10 - 0.20
						FILL	FILL: Gravelly Silt, non-plastic, fine to coarse grained, poorly graded, sub-rounded to sub-angular gravel, minor fine to coarse grained, poorly graded, sub-rounded to sub-angular sand, trace clay and organics, firm, brown, moist, dry of plastic limit. Anthropogenic material included concrete, asphalt and coke pieces.			
						FILL	FILL: Silty Sand, fine to medium grained, poorly graded, sub-rounded to sub-angular sand, minor fine to coarse grained, poorly graded, sub-rounded to sub-angular gravel, trace clay, loose, dark grey, moist.		0.1	SB7381_0.40 - 0.50
									0.0	SB7381_0.90 - 1.00
				1.5		SP	SAND: fine to coarse grained, poorly graded, sub-angular to rounded, grey, loose, wet, becoming pale brown, mostly fine grained from 1.9 m bgl.			
				2.0		SP	Fine grained sand, pale brown		0.0	SB7381_1.90 - 2.00
				2.5			SB7381 terminated at 2.00 m bgl Target depth reached.			

1. SENVERSA STANDARD M17571\_SO.GPJ SENVERSA\_GINT.GDT 5/12/19



PROJECT NAME Due Diligence Site Assessmet

PROJECT NUMBER M17571

PROJECT LOCATION 32-34 South Wharf, Lorimer Street, Port Melbourne

DATE STARTED 19/11/19

COMPLETED 19/11/19

LOGGED BY SO

CHECKED BY SI

CONTRACTOR Qest

LOCATION (Easting, Northing, Zone)

EQUIPMENT HA, NDD

DIMENSIONS 120 mm

INCLINATION Vertical

GROUNDWATER NOTES -

CASING LEVEL -

SURFACE LEVEL -

GENERAL NOTES

DRILLING						FIELD MATERIAL DESCRIPTION			SAMPLING		
Method	Core Recovery (%)	Water	Well Details	Depth (m)	Graphic Log	Classification Symbol	Material Description	Additional Observations	PID (ppm)	Sample ID & Interval (QA/QC)	
HA / NDD				0.5		FILL	FILL: Gravelly Silt, non-plastic, fine to medium grained, poorly graded, sub-rounded to sub-angular gravel, minor clay, minor sand and minor organics, loose, brown, moist, dry of plastic limit. Anthropogenic material included concrete pieces.				
						FILL	FILL: Silty Gravel, fine to coarse grained, poorly graded, sub-rounded to sub-angular gravel, minor sand, fine to coarse grained, poorly graded, sub-rounded to sub-angular sand, trace clay and organics, medium dense, grey, moist. Anthropogenic material included concrete and brick paver pieces.		0.1	SB7382_0.10 - 0.20	
						FILL	FILL: Sand, fine to medium grained, poorly graded, sub-rounded to sub-angular sand, minor silt, minor fine to medium grained, poorly graded, sub-rounded to sub-angular gravel, trace clay, loose, grey, moist.				
						SP	SAND: fine to coarse grained, poorly graded, sub-angular to rounded, trace silt, grey, loose, moist.		0.1	SB7382_0.40 - 0.50	
									1.0		
				1.5		SP	Pale orange brown, wet, fine grained sand increasing with depth.				
				2.0							
				2.5			SB7382 terminated at 2.00 m bgl Target depth reached.				
									0.0	SB7382_0.80 - 0.90	
										0.0	SB7382_1.90 - 2.00

1. SENVERSA STANDARD M17571\_SO.GPJ SENVERSA\_GINT.GDT 5/12/19



PROJECT NAME Due Diligence Site Assessmet

PROJECT NUMBER M17571

PROJECT LOCATION 32-34 South Wharf, Lorimer Street, Port Melbourne

DATE STARTED 19/11/19

COMPLETED 19/11/19

LOGGED BY SO

CHECKED BY SI

CONTRACTOR Qest

LOCATION (Easting, Northing, Zone)

EQUIPMENT HA, NDD

DIMENSIONS 120 mm

INCLINATION Vertical

GROUNDWATER NOTES -

CASING LEVEL -

SURFACE LEVEL -

GENERAL NOTES

DRILLING					FIELD MATERIAL DESCRIPTION			SAMPLING		
Method	Core Recovery (%)	Water	Well Details	Depth (m)	Graphic Log	Classification Symbol	Material Description	Additional Observations	PID (ppm)	Sample ID & Interval (QA/QC)
HA / NDD				0.5		FILL	FILL: Silty Sand, fine to coarse grained, poorly graded, sub-rounded to sub-angular sand, minor clay and fine to coarse grained, poorly graded, sub-rounded to sub-angular gravel, loose, grey-brown, moist. Anthropogenic material included concrete pieces.		0.1	SB7383_0.10 - 0.20
						FILL	FILL: Sandy Gravel, fine to coarse grained, poorly graded, sub-rounded to sub-angular gravel, fine to coarse grained, poorly graded, sub-rounded to sub-angular sand, minor silt, minor clay increasing with depth. Anthropogenic material included concrete pieces.			
						FILL	FILL: Gravelly CLAY, high plasticity, fine to coarse grained, poorly graded, sub-rounded to sub-angular gravel, minor fine to coarse grained, poorly graded, sub-rounded to sub-angular sand, mottled grey-brown and light brown, stiff, moist, near plastic limit.		0.1	SB7383_0.40 - 0.50
						FILL	FILL: Sand, fine to coarse grained, poorly graded, sub-angular to rounded, trace fine to coarse grained, poorly graded, sub-rounded to sub-angular gravel, trace clay and silt, grey, loose, moist.			
						SP	SAND: fine to coarse grained, poorly graded, sub-angular to rounded, grey, loose, moist, becoming pale brown.		0.0	SB7383_0.90 - 1.00
				1.5		SP	Fine grained, pale brown, wet.			
				2.0					0.0	SB7383_1.90 - 2.00
				2.5			SB7383 terminated at 2.00 m bgl Target depth reached.			

1. SENVERSA STANDARD M17571\_SO.GPJ SENVERSA\_GINT.GDT 5/12/19



PROJECT NAME Due Diligence Site Assessmet

PROJECT NUMBER M17571

PROJECT LOCATION 32-34 South Wharf, Lorimer Street, Port Melbourne

DATE STARTED 19/11/19

COMPLETED 19/11/19

LOGGED BY SO

CHECKED BY SI

CONTRACTOR Qest

LOCATION (Easting, Northing, Zone)

EQUIPMENT HA, NDD

DIMENSIONS 120 mm

INCLINATION Vertical

GROUNDWATER NOTES -

CASING LEVEL -

SURFACE LEVEL -

GENERAL NOTES

DRILLING					FIELD MATERIAL DESCRIPTION			SAMPLING		
Method	Core Recovery (%)	Water	Well Details	Depth (m)	Graphic Log	Classification Symbol	Material Description	Additional Observations	PID (ppm)	Sample ID & Interval (QA/QC)
HA / NDD				0.5		FILL	FILL: Gravelly Silt, non-plastic, fine to medium grained, poorly graded, sub-rounded to sub-angular gravel, minor clay, sand and organics, loose, brown, moist, dry of plastic limit. Anthropogenic material included concrete pieces.			
						FILL	FILL: Clayey Gravel, fine to coarse grained, poorly graded, sub-rounded to sub-angular gravel, minor fine to coarse grained, poorly graded, sub-rounded to sub-angular sand, grey-brown, moist. Clay increasing with depth.		0.0	SB7384_0.10 - 0.20 QS02/03
						FILL	FILL: Gravelly CLAY, high plasticity, fine to coarse grained, poorly graded, sub-rounded to sub-angular gravel, minor fine to coarse grained, poorly graded, sub-rounded to sub-angular sand, mottled, stiff, mottled grey-brown and light brown, moist, dry of plastic limit. Fine to coarse grained, poorly graded, sub-rounded to sub-angular gravel, minor fine to coarse grained, poorly graded, sub-rounded to sub-angular sand.		0.0	SB7384_0.40 - 0.50
						FILL	FILL: Sand, fine to coarse grained, poorly graded, sub-angular to rounded, trace fine to coarse grained, poorly graded, sub-rounded to sub-angular gravel, trace clay and silt, grey, loose, moist.		0.0	SB7384_0.90 - 1.00
						SP	SAND: fine to coarse grained, poorly graded, sub-angular to rounded, grey, loose, moist, becoming pale brown.			
						SP	Fine grained, wet.			
				2.0			SB7384 terminated at 2.00 m bgl Target depth reached.			
				2.5						

1.-SENVERSA STANDARD M17571\_SO.GPJ SENVERSA\_GINT.GDT 5/12/19



## Appendix E: Laboratory Reports





Chain of Custody Documentation

Laboratory: ALS VIC  
Address: 2-4 Westall Road, Springvale  
Contact: Larissa Burns / Sample Log In  
Phone: 03 8549 9600

Job Number:	M17571	Purchase Order:	
Project Name:	32 to 34 South Wharf DD	Quote No:	ME-804-19
Sampled By:	Matthew Hunt	Turn Around Time:	standard
Project Manager:	Lucinda Trickey	Page:	of
Email Report To:	lucinda.trickey@senversa.com.au	Phone/Mobile:	+61 424 172 065

Sample Information		Container Information		Analysis Required										Comments: e.g. Highly contaminated sample; hazardous materials present; trace LORs etc.						
Lab ID	Sample ID	Matrix *	Date	Time	Type / Code	Total Bottles	S-26: TRH / BTEXN / PAH / 8 Metals	Sulfate	pH											
	SB09-0.1-0.2	Soil	9/10	AM	1 Soil	1														
	0.5-0.6																			
	-1.0-1.1																			
	-1.5-1.6																			
	1.9-2.0																			
	SB09 0.1-0.2																			
	-0.5-0.6																			
	-1.0-1.1																			
	-1.5-1.6																			
	-2.0-2.1																			
	SB10-0.1-0.2																			
	-0.5-0.6																			
	-0.9-1.0																			
	-1.5-1.6																			
	-1.9-2.0																			
	SB07 0.1-0.2			PM																
	-0.5-0.6																			
	-1.0-1.1																			
	-1.5-1.6																			
	-1.9-2.0																			
Total						20														

Sampler: I attest that proper field sampling procedures in accordance with Senversa standard procedures and/or project specifications were used during the collection of these samples: Sampler Name: Matt Hunt Signature: [Signature] Date: 10/10

Relinquished By:		Method of Shipment (if applicable):		Received by:	
Name/Signature:	Date:	Carrier / Reference #:		Name/Signature:	Date:
Of:	Time:	Date/Time:	5 CIVIC 5:00AM	Of:	Time:
Name/Signature:	Date:	Carrier / Reference #:		Name/Signature:	Date:
Of:	Time:	Date/Time:		Of:	Time:
Name/Signature:	Date:	Carrier / Reference #:		Name/Signature:	Date:
Of:	Time:	Date/Time:		Of:	Time:

Water Container Codes: P = Unpreserved Plastic; N = Nitric Acid (HNO<sub>3</sub>) Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide (NaOH)/Cadmium (Cd) Preserved; S = Sodium Hydroxide Preserved Plastic; STH = Sodium thiosulfate preserved plastic; V = VOA Vial Hydrochloric Acid (HCl) Preserved; VS = VOA Vial Sulphuric Preserved; VSA = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulphuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; UA = Unpreserved Amber Glass; L=Lugol's iodine preserved white plastic bottle; SW= sulfuric acid preserved wide mouth glass jar

Completed by: \_\_\_\_\_  
Checked by: \_\_\_\_\_



## Enviro Sample Vic

---

**From:** Harry Bacalis  
**Sent:** Monday, 14 October 2019 4:34 PM  
**To:** Enviro Sample Vic  
**Subject:** FW: COC - M17571  
**Attachments:** COC\_M17571\_09.10.19.pdf

Canh – Apparently these came in on Thursday, I can't see anything on ELVIS

Kind regards,

Harry Bacalis  
Phone: +61 3 8564 5064  
Mobile: +61 438 858 924  
Email : [HarryBacalis@eurofins.com](mailto:HarryBacalis@eurofins.com)

---

**From:** Matthew Hunt [<mailto:Matthew.Hunt@senversa.com.au>]  
**Sent:** Monday, 14 October 2019 2:19 PM  
**To:** Harry Bacalis  
**Cc:** Lucinda Trickey  
**Subject:** COC - M17571

EXTERNAL EMAIL\*

Hi Harry,

Please see attached our COC with analysis requested. Please note that these samples were delivered on Thursday (10/10) so if there are any samples that may fall outside of holding time it would be great if we could get them analysed asap.

Thank you,  
Matt

**Matthew Hunt**  
Project Hydrogeologist



Senversa Pty Ltd  
Level 6, 15 William Street, Melbourne VIC 3000

m: +61 0448 797 725 | e: [Matthew.Hunt@senversa.com.au](mailto:Matthew.Hunt@senversa.com.au)  
t: +61 3 9606 0070 | f: +61 3 9606 0074 | [www.senversa.com.au](http://www.senversa.com.au)

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**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: **Senversa Pty Ltd VIC**  
Contact name: Lucinda Trickey  
Project name: POM DD  
Project ID: M17571  
COC number: Not provided  
Turn around time: 5 Day  
Date/Time received: Oct 10, 2019 5:29 PM  
Eurofins reference: **682320**

### Sample information

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 4.3 degrees Celsius.
- 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:

Harry Bacalis on Phone : or by e.mail: HarryBacalis@eurofins.com

Results will be delivered electronically via e.mail to Lucinda Trickey - Lucinda.Trickey@senversa.com.au.







<b>Company Name:</b>	Senversa Pty Ltd VIC	<b>Order No.:</b>		<b>Received:</b>	Oct 10, 2019 5:29 PM
<b>Address:</b>	Level 6, 15 William St Melbourne VIC 3000	<b>Report #:</b>	682320	<b>Due:</b>	Oct 17, 2019
<b>Project Name:</b>	POM DD	<b>Phone:</b>	9606 0070	<b>Priority:</b>	5 Day
<b>Project ID:</b>	M17571	<b>Fax:</b>		<b>Contact Name:</b>	Lucinda Trickey

**Eurofins Analytical Services Manager : Harry Bacalis**

Sample Detail				Arsenic	Cadmium	Chromium	Copper	HOLD	Lead	Mercury	Nickel	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	Zinc	Polycyclic Aromatic Hydrocarbons	BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons	
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>																			
<b>Brisbane Laboratory - NATA Site # 20794</b>																			
<b>Perth Laboratory - NATA Site # 23736</b>																			
34	QC01	Oct 09, 2019	Soil					X											
<b>Test Counts</b>				15	15	15	15	19	15	15	15	14	15	15	15	15	14	15	15

Senversa Pty Ltd VIC  
Level 6, 15 William St  
Melbourne  
VIC 3000



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: **Lucinda Trickey**

Report **682320-S-V2**

Project name **POM DD**

Project ID **M17571**

Received Date **Oct 10, 2019**

Client Sample ID			SB7379_0.1-0.2	SB7379_1.5-1.6	SB7378_0.1-0.2	SB7378_1.0-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Oc19394	M19-Oc19395	M19-Oc19396	M19-Oc19397
Date Sampled			Oct 09, 2019	Oct 09, 2019	Oct 09, 2019	Oct 09, 2019
Test/Reference	LOR	Unit				
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>						
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
<b>BTEX</b>						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	68	77	100	74
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
Naphthalene <sup>N02</sup>	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) <sup>N04</sup>	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	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
<b>Polycyclic Aromatic Hydrocarbons</b>						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SB7379_0.1-0.2	SB7379_1.5-1.6	SB7378_0.1-0.2	SB7378_1.0-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Oc19394	M19-Oc19395	M19-Oc19396	M19-Oc19397
Date Sampled			Oct 09, 2019	Oct 09, 2019	Oct 09, 2019	Oct 09, 2019
Test/Reference	LOR	Unit				
<b>Polycyclic Aromatic Hydrocarbons</b>						
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	77	59	62	65
p-Terphenyl-d14 (surr.)	1	%	62	58	60	64
<b>Heavy Metals</b>						
Arsenic	2	mg/kg	< 2	< 2	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	19	20	31	< 5
Copper	5	mg/kg	50	40	48	< 5
Lead	5	mg/kg	< 5	< 5	< 5	< 5
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	120	120	130	< 5
Zinc	5	mg/kg	73	70	74	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	9.7	9.9	9.5	7.5
Sulphate (as SO4)	30	mg/kg	60	< 30	< 30	290
% Moisture	1	%	8.8	7.1	10	4.1

Client Sample ID			SB7380_0.1-0.2	SB7380_1.0-1.1	SB7377_0.1-0.2	SB7377_1.5-1.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Oc19398	M19-Oc19399	M19-Oc19400	M19-Oc19401
Date Sampled			Oct 09, 2019	Oct 09, 2019	Oct 09, 2019	Oct 09, 2019
Test/Reference	LOR	Unit				
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>						
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	78	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	170	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	248	< 50
<b>BTEX</b>						
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	%	123	115	96	109

Client Sample ID			SB7380_0.1-0.2	SB7380_1.0-1.1	SB7377_0.1-0.2	SB7377_1.5-1.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Oc19398	M19-Oc19399	M19-Oc19400	M19-Oc19401
Date Sampled			Oct 09, 2019	Oct 09, 2019	Oct 09, 2019	Oct 09, 2019
Test/Reference	LOR	Unit				
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
Naphthalene <sup>N02</sup>	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) <sup>N04</sup>	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	150	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	190	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	340	< 100
<b>Polycyclic Aromatic Hydrocarbons</b>						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	71	71	71	61
p-Terphenyl-d14 (surr.)	1	%	62	65	59	57
<b>Other Parameters</b>						
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	11	8.9	11	8.0
Sulphate (as SO4)	30	mg/kg	140	32	170	93
% Moisture	1	%	8.1	4.9	12	13
<b>Heavy Metals</b>						
Arsenic	2	mg/kg	< 2	< 2	9.3	2.2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	22	< 5	23	< 5
Copper	5	mg/kg	45	< 5	46	< 5
Lead	5	mg/kg	< 5	< 5	15	< 5
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	130	< 5	71	< 5
Zinc	5	mg/kg	71	< 5	94	< 5

Client Sample ID			SB7376_0.1-0.2	SB7376_1.5-1.6	SB7375_0.5-0.6	SB7375_0.9-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Oc19402	M19-Oc19403	M19-Oc19404	M19-Oc19405
Date Sampled			Oct 09, 2019	Oct 09, 2019	Oct 09, 2019	Oct 09, 2019
Test/Reference	LOR	Unit				
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>						
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	57	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	120	< 50	74	< 50
TRH C10-C36 (Total)	50	mg/kg	177	< 50	74	< 50
<b>BTEX</b>						
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	%	120	96	108	83
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
Naphthalene <sup>N02</sup>	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) <sup>N04</sup>	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	120	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	110	< 100	130	< 100
TRH >C10-C40 (total)*	100	mg/kg	230	< 100	130	< 100
<b>Polycyclic Aromatic Hydrocarbons</b>						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	67	87	66	65
p-Terphenyl-d14 (surr.)	1	%	55	65	55	57
<b>pH (1:5 Aqueous extract at 25°C as rec.)</b>						
	0.1	pH Units	11	8.9	9.6	9.8
<b>Sulphate (as SO4)</b>						
	30	mg/kg	200	< 30	< 30	80
<b>% Moisture</b>						
	1	%	10	8.5	10.0	8.6

Client Sample ID			SB7376_0.1-0.2	SB7376_1.5-1.6	SB7375_0.5-0.6	SB7375_0.9-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Oc19402	M19-Oc19403	M19-Oc19404	M19-Oc19405
Date Sampled			Oct 09, 2019	Oct 09, 2019	Oct 09, 2019	Oct 09, 2019
Test/Reference	LOR	Unit				
<b>Heavy Metals</b>						
Arsenic	2	mg/kg	5.0	3.1	< 2	2.6
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	20	< 5	7.3	19
Copper	5	mg/kg	37	< 5	7.5	27
Lead	5	mg/kg	27	< 5	< 5	9.1
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	58	< 5	23	73
Zinc	5	mg/kg	92	< 5	17	69

Client Sample ID			QC05
Sample Matrix			Soil
Eurofins Sample No.			M19-Oc19407
Date Sampled			Oct 09, 2019
Test/Reference	LOR	Unit	
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50
<b>BTEX</b>			
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	%	106
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>			
Naphthalene <sup>N02</sup>	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100
<b>Polycyclic Aromatic Hydrocarbons</b>			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	< 0.5

<b>Client Sample ID</b>			<b>QC05</b>
<b>Sample Matrix</b>			<b>Soil</b>
<b>Eurofins Sample No.</b>			<b>M19-Oc19407</b>
<b>Date Sampled</b>			<b>Oct 09, 2019</b>
Test/Reference	LOR	Unit	
<b>Polycyclic Aromatic Hydrocarbons</b>			
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	54
p-Terphenyl-d14 (surr.)	1	%	58
<b>pH (1:5 Aqueous extract at 25°C as rec.)</b>			
	0.1	pH Units	9.6
<b>Sulphate (as SO4)</b>			
	30	mg/kg	< 30
<b>% Moisture</b>			
	1	%	10
<b>Heavy Metals</b>			
Arsenic	2	mg/kg	< 2
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	< 5
Copper	5	mg/kg	5.5
Lead	5	mg/kg	< 5
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	14
Zinc	5	mg/kg	10

**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.

<b>Description</b>	<b>Testing Site</b>	<b>Extracted</b>	<b>Holding Time</b>
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Oct 15, 2019	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Oct 15, 2019	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Oct 15, 2019	
<b>BTEX and Naphthalene</b>			
<b>BTEX</b> - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Oct 15, 2019	14 Days
<b>Polycyclic Aromatic Hydrocarbons</b> - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Oct 15, 2019	14 Days
<b>pH (1:5 Aqueous extract at 25°C as rec.)</b> - Method: LTM-GEN-7090 pH in soil by ISE	Melbourne	Oct 15, 2019	7 Days
<b>Sulphate (as SO<sub>4</sub>)</b> - Method: LTM-INO-4110 Sulfate by Discrete Analyser	Melbourne	Oct 15, 2019	28 Days
<b>Heavy Metals</b> - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Oct 15, 2019	180 Days
<b>Mercury</b> - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Oct 15, 2019	28 Days
<b>% Moisture</b> - Method: LTM-GEN-7080 Moisture	Melbourne	Oct 14, 2019	14 Days

<b>Company Name:</b> Senversa Pty Ltd VIC	<b>Order No.:</b>	<b>Received:</b> Oct 10, 2019 5:29 PM
<b>Address:</b> Level 6, 15 William St Melbourne VIC 3000	<b>Report #:</b> 682320	<b>Due:</b> Oct 17, 2019
<b>Project Name:</b> POM DD	<b>Phone:</b> 9606 0070	<b>Priority:</b> 5 Day
<b>Project ID:</b> M17571	<b>Fax:</b>	<b>Contact Name:</b> Lucinda Trickey

**Eurofins Analytical Services Manager : Harry Bacalis**

Sample Detail						Arsenic	Cadmium	Chromium	Copper	HOLD	Lead	Mercury	Nickel	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	Zinc	Polycyclic Aromatic Hydrocarbons	BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>																				
<b>Brisbane Laboratory - NATA Site # 20794</b>																				
<b>Perth Laboratory - NATA Site # 23736</b>																				
<b>External Laboratory</b>																				
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID															
1	SB09_0.1-0.2	Oct 09, 2019		Soil	M19-Oc19394	X	X	X	X		X	X	X	X	X	X	X	X	X	X
2	SB09_1.5-1.6	Oct 09, 2019		Soil	M19-Oc19395	X	X	X	X		X	X	X	X	X	X	X	X	X	X
3	SB08_0.1-0.2	Oct 09, 2019		Soil	M19-Oc19396	X	X	X	X		X	X	X	X	X	X	X	X	X	X
4	SB08_1.0-1.1	Oct 09, 2019		Soil	M19-Oc19397	X	X	X	X		X	X	X	X	X	X	X	X	X	X
5	SB10_0.1-0.2	Oct 09, 2019		Soil	M19-Oc19398	X	X	X	X		X	X	X	X	X	X	X	X	X	X
6	SB10_1.0-1.1	Oct 09, 2019		Soil	M19-Oc19399	X	X	X	X		X	X	X	X	X	X	X	X	X	X
7	SB07_0.1-0.2	Oct 09, 2019		Soil	M19-Oc19400	X	X	X	X		X	X	X	X	X	X	X	X	X	X
8	SB07_1.5-1.6	Oct 09, 2019		Soil	M19-Oc19401	X	X	X	X		X	X	X	X	X	X	X	X	X	X
9	SB06_0.1-0.2	Oct 09, 2019		Soil	M19-Oc19402	X	X	X	X		X	X	X	X	X	X	X	X	X	X

<b>Company Name:</b> Senversa Pty Ltd VIC	<b>Order No.:</b>	<b>Received:</b> Oct 10, 2019 5:29 PM
<b>Address:</b> Level 6, 15 William St Melbourne VIC 3000	<b>Report #:</b> 682320	<b>Due:</b> Oct 17, 2019
<b>Project Name:</b> POM DD	<b>Phone:</b> 9606 0070	<b>Priority:</b> 5 Day
<b>Project ID:</b> M17571	<b>Fax:</b>	<b>Contact Name:</b> Lucinda Trickey

**Eurofins Analytical Services Manager : Harry Bacalis**

Sample Detail						Arsenic	Cadmium	Chromium	Copper	HOLD	Lead	Mercury	Nickel	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	Zinc	Polycyclic Aromatic Hydrocarbons	BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>																				
<b>Brisbane Laboratory - NATA Site # 20794</b>																				
<b>Perth Laboratory - NATA Site # 23736</b>																				
10	SB06_1.5-1.6	Oct 09, 2019		Soil	M19-Oc19403	X	X	X	X		X	X	X	X	X	X	X	X	X	X
11	SB05_0.5-0.6	Oct 09, 2019		Soil	M19-Oc19404	X	X	X	X		X	X	X	X	X	X	X	X	X	X
12	SB05_0.9-1.0	Oct 09, 2019		Soil	M19-Oc19405	X	X	X	X		X	X	X	X	X	X	X	X	X	X
13	SB11_0.9-1.0	Oct 09, 2019		Soil	M19-Oc19406	X	X	X	X		X	X	X	X	X	X	X	X	X	X
14	QC05	Oct 09, 2019		Soil	M19-Oc19407	X	X	X	X		X	X	X	X	X	X	X	X	X	X
15	QC09	Oct 09, 2019		Water	M19-Oc19408	X	X	X	X		X	X	X		X	X	X	X		X
16	SP09_0.5-0.6	Oct 09, 2019		Soil	M19-Oc19409					X										
17	SP09_1.0-1.1	Oct 09, 2019		Soil	M19-Oc19410					X										
18	SP09_2.0-2.1	Oct 09, 2019		Soil	M19-Oc19411					X										
19	SP08_0.5-0.6	Oct 09, 2019		Soil	M19-Oc19412					X										
20	SP08_1.5-1.6	Oct 09, 2019		Soil	M19-Oc19413					X										
21	SP08_1.9-2.0	Oct 09, 2019		Soil	M19-Oc19414					X										

<b>Company Name:</b> Senversa Pty Ltd VIC	<b>Order No.:</b>	<b>Received:</b> Oct 10, 2019 5:29 PM
<b>Address:</b> Level 6, 15 William St Melbourne VIC 3000	<b>Report #:</b> 682320	<b>Due:</b> Oct 17, 2019
	<b>Phone:</b> 9606 0070	<b>Priority:</b> 5 Day
	<b>Fax:</b>	<b>Contact Name:</b> Lucinda Trickey
<b>Project Name:</b> POM DD	<b>Eurofins Analytical Services Manager : Harry Bacalis</b>	
<b>Project ID:</b> M17571		

Sample Detail						Arsenic	Cadmium	Chromium	Copper	HOLD	Lead	Mercury	Nickel	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	Zinc	Polycyclic Aromatic Hydrocarbons	BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>						X	X	X	X	X	X	X	X	X	X	X	X	X	X	
<b>Sydney Laboratory - NATA Site # 18217</b>																				
<b>Brisbane Laboratory - NATA Site # 20794</b>																				
<b>Perth Laboratory - NATA Site # 23736</b>																				
22	SP10_0.5-0.6	Oct 09, 2019		Soil	M19-Oc19415					X										
23	SP10_1.5-1.6	Oct 09, 2019		Soil	M19-Oc19416					X										
24	SP10_1.9-2.0	Oct 09, 2019		Soil	M19-Oc19417					X										
25	SP07_0.5-0.6	Oct 09, 2019		Soil	M19-Oc19418					X										
26	SP07_1.0-1.1	Oct 09, 2019		Soil	M19-Oc19419					X										
27	SP07_1.9-2.0	Oct 09, 2019		Soil	M19-Oc19420					X										
28	SP06_0.5-0.6	Oct 09, 2019		Soil	M19-Oc19421					X										
29	SP06_1.0-1.1	Oct 09, 2019		Soil	M19-Oc19422					X										
30	SP06_1.9-2.0	Oct 09, 2019		Soil	M19-Oc19423					X										
31	SP05_1.5-1.6	Oct 09, 2019		Soil	M19-Oc19424					X										
32	SP05_1.9-2.0	Oct 09, 2019		Soil	M19-Oc19425					X										
33	SP11_0.5-0.6	Oct 09, 2019		Soil	M19-Oc19426					X										

<b>Company Name:</b> Senversa Pty Ltd VIC	<b>Order No.:</b>	<b>Received:</b> Oct 10, 2019 5:29 PM
<b>Address:</b> Level 6, 15 William St Melbourne VIC 3000	<b>Report #:</b> 682320	<b>Due:</b> Oct 17, 2019
<b>Project Name:</b> POM DD	<b>Phone:</b> 9606 0070	<b>Priority:</b> 5 Day
<b>Project ID:</b> M17571	<b>Fax:</b>	<b>Contact Name:</b> Lucinda Trickey

**Eurofins Analytical Services Manager : Harry Bacalis**

Sample Detail				Arsenic	Cadmium	Chromium	Copper	HOLD	Lead	Mercury	Nickel	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	Zinc	Polycyclic Aromatic Hydrocarbons	BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>																		
<b>Brisbane Laboratory - NATA Site # 20794</b>																		
<b>Perth Laboratory - NATA Site # 23736</b>																		
34	QC01	Oct 09, 2019	Soil					X										
<b>Test Counts</b>				15	15	15	15	19	15	15	15	14	15	15	15	15	14	15

**Internal Quality Control Review and Glossary**
**General**

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

**Holding Times**

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

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

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

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

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

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

**Units**

**mg/kg:** milligrams per kilogram

**mg/L:** milligrams per litre

**ug/L:** micrograms per litre

**ppm:** Parts per million

**ppb:** Parts per billion

**%:** Percentage

**org/100mL:** Organisms per 100 millilitres

**NTU:** Nephelometric Turbidity Units

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

**Terms**

<b>Dry</b>	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
<b>LOR</b>	Limit of Reporting.
<b>SPIKE</b>	Addition of the analyte to the sample and reported as percentage recovery.
<b>RPD</b>	Relative Percent Difference between two Duplicate pieces of analysis.
<b>LCS</b>	Laboratory Control Sample - reported as percent recovery.
<b>CRM</b>	Certified Reference Material - reported as percent recovery.
<b>Method Blank</b>	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.
<b>Surr - Surrogate</b>	The addition of a like compound to the analyte target and reported as percentage recovery.
<b>Duplicate</b>	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
<b>USEPA</b>	United States Environmental Protection Agency
<b>APHA</b>	American Public Health Association
<b>TCLP</b>	Toxicity Characteristic Leaching Procedure
<b>COC</b>	Chain of Custody
<b>SRA</b>	Sample Receipt Advice
<b>QSM</b>	US Department of Defense Quality Systems Manual Version 5.3
<b>CP</b>	Client Parent - QC was performed on samples pertaining to this report
<b>NCP</b>	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.
<b>TEQ</b>	Toxic Equivalency Quotient

**QC - Acceptance Criteria**

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

Results <10 times the LOR : No Limit

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

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

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

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

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

**QC Data General Comments**

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

**Quality Control Results**

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Method Blank</b>							
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>							
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	
<b>Method Blank</b>							
<b>BTEX</b>							
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	
<b>Method Blank</b>							
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>							
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	
<b>Method Blank</b>							
<b>Polycyclic Aromatic Hydrocarbons</b>							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
<b>Method Blank</b>							
<b>Heavy Metals</b>							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
<b>LCS - % Recovery</b>							
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>							
TRH C6-C9	%	92			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
TRH C10-C14	%	123			70-130	Pass		
<b>LCS - % Recovery</b>								
<b>BTEX</b>								
Benzene	%	86			70-130	Pass		
Toluene	%	80			70-130	Pass		
Ethylbenzene	%	91			70-130	Pass		
m&p-Xylenes	%	89			70-130	Pass		
Xylenes - Total	%	90			70-130	Pass		
<b>LCS - % Recovery</b>								
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>								
Naphthalene	%	106			70-130	Pass		
TRH C6-C10	%	90			70-130	Pass		
TRH >C10-C16	%	119			70-130	Pass		
<b>LCS - % Recovery</b>								
<b>Polycyclic Aromatic Hydrocarbons</b>								
Acenaphthene	%	85			70-130	Pass		
Acenaphthylene	%	83			70-130	Pass		
Anthracene	%	78			70-130	Pass		
Benz(a)anthracene	%	73			70-130	Pass		
Benzo(a)pyrene	%	74			70-130	Pass		
Benzo(b&j)fluoranthene	%	79			70-130	Pass		
Benzo(g,h,i)perylene	%	76			70-130	Pass		
Benzo(k)fluoranthene	%	76			70-130	Pass		
Chrysene	%	82			70-130	Pass		
Dibenz(a,h)anthracene	%	72			70-130	Pass		
Fluoranthene	%	81			70-130	Pass		
Fluorene	%	83			70-130	Pass		
Indeno(1,2,3-cd)pyrene	%	86			70-130	Pass		
Naphthalene	%	84			70-130	Pass		
Phenanthrene	%	81			70-130	Pass		
Pyrene	%	82			70-130	Pass		
<b>LCS - % Recovery</b>								
<b>Heavy Metals</b>								
Arsenic	%	111			80-120	Pass		
Cadmium	%	96			80-120	Pass		
Chromium	%	117			80-120	Pass		
Copper	%	114			80-120	Pass		
Lead	%	118			80-120	Pass		
Mercury	%	102			75-125	Pass		
Nickel	%	114			80-120	Pass		
Zinc	%	112			80-120	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
<b>Spike - % Recovery</b>								
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1				
TRH C6-C9	M19-Oc19395	CP	%	82		70-130	Pass	
TRH C10-C14	M19-Oc19395	CP	%	102		70-130	Pass	
<b>Spike - % Recovery</b>								
<b>BTEX</b>				Result 1				
Benzene	M19-Oc19395	CP	%	89		70-130	Pass	
Toluene	M19-Oc19395	CP	%	80		70-130	Pass	
Ethylbenzene	M19-Oc19395	CP	%	84		70-130	Pass	
m&p-Xylenes	M19-Oc19395	CP	%	82		70-130	Pass	
o-Xylene	M19-Oc19395	CP	%	87		70-130	Pass	
Xylenes - Total	M19-Oc19395	CP	%	84		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Spike - % Recovery</b>									
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1					
Naphthalene	M19-Oc19395	CP	%	95			70-130	Pass	
TRH C6-C10	M19-Oc19395	CP	%	82			70-130	Pass	
TRH >C10-C16	M19-Oc19395	CP	%	98			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Polycyclic Aromatic Hydrocarbons</b>				Result 1					
Acenaphthene	M19-Oc19395	CP	%	113			70-130	Pass	
Acenaphthylene	M19-Oc19395	CP	%	103			70-130	Pass	
Anthracene	M19-Oc19395	CP	%	99			70-130	Pass	
Benzo(a)anthracene	M19-Oc19395	CP	%	85			70-130	Pass	
Benzo(a)pyrene	M19-Oc19395	CP	%	96			70-130	Pass	
Benzo(b&j)fluoranthene	M19-Oc19395	CP	%	82			70-130	Pass	
Benzo(g,h,i)perylene	M19-Oc19395	CP	%	99			70-130	Pass	
Benzo(k)fluoranthene	M19-Oc19395	CP	%	107			70-130	Pass	
Chrysene	M19-Oc19395	CP	%	102			70-130	Pass	
Dibenz(a,h)anthracene	M19-Oc19395	CP	%	88			70-130	Pass	
Fluoranthene	M19-Oc19395	CP	%	103			70-130	Pass	
Fluorene	M19-Oc19395	CP	%	106			70-130	Pass	
Indeno(1,2,3-cd)pyrene	M19-Oc19395	CP	%	105			70-130	Pass	
Naphthalene	M19-Oc19395	CP	%	109			70-130	Pass	
Phenanthrene	M19-Oc19395	CP	%	104			70-130	Pass	
Pyrene	M19-Oc19395	CP	%	105			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Heavy Metals</b>				Result 1					
Arsenic	M19-Oc19395	CP	%	103			75-125	Pass	
Cadmium	M19-Oc19395	CP	%	82			75-125	Pass	
Chromium	M19-Oc19395	CP	%	111			75-125	Pass	
Copper	M19-Oc19395	CP	%	108			75-125	Pass	
Lead	M19-Oc19395	CP	%	107			75-125	Pass	
Mercury	M19-Oc19395	CP	%	95			70-130	Pass	
Nickel	M19-Oc19395	CP	%	110			75-125	Pass	
Zinc	M19-Oc19395	CP	%	107			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Duplicate</b>									
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1	Result 2	RPD			
TRH C6-C9	M19-Oc19394	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M19-Oc19394	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M19-Oc19394	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M19-Oc19394	CP	mg/kg	< 50	< 50	<1	30%	Pass	
<b>Duplicate</b>									
<b>BTEX</b>				Result 1	Result 2	RPD			
Benzene	M19-Oc19394	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M19-Oc19394	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M19-Oc19394	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M19-Oc19394	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M19-Oc19394	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M19-Oc19394	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
<b>Duplicate</b>									
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1	Result 2	RPD			
Naphthalene	M19-Oc19394	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M19-Oc19394	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M19-Oc19394	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M19-Oc19394	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M19-Oc19394	CP	mg/kg	< 100	< 100	<1	30%	Pass	

Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	S19-Oc13609	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	S19-Oc13609	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	S19-Oc13609	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benz(a)anthracene	S19-Oc13609	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)pyrene	S19-Oc13609	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	S19-Oc13609	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	S19-Oc13609	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	S19-Oc13609	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	S19-Oc13609	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	S19-Oc13609	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	S19-Oc13609	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	S19-Oc13609	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1.2.3-cd)pyrene	S19-Oc13609	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	S19-Oc13609	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	S19-Oc13609	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	S19-Oc13609	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
pH (1:5 Aqueous extract at 25°C as rec.)	M19-Oc19394	CP	pH Units	9.7	9.9	pass	30%	Pass
Sulphate (as SO4)	M19-Oc19394	CP	mg/kg	60	61	2.0	30%	Pass
% Moisture	M19-Oc19394	CP	%	8.8	9.0	3.0	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M19-Oc19394	CP	mg/kg	< 2	< 2	<1	30%	Pass
Cadmium	M19-Oc19394	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M19-Oc19394	CP	mg/kg	19	19	1.0	30%	Pass
Copper	M19-Oc19394	CP	mg/kg	50	55	10	30%	Pass
Lead	M19-Oc19394	CP	mg/kg	< 5	< 5	<1	30%	Pass
Mercury	M19-Oc19394	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	M19-Oc19394	CP	mg/kg	120	120	<1	30%	Pass
Zinc	M19-Oc19394	CP	mg/kg	73	72	1.0	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	M19-Oc19395	CP	mg/kg	< 2	< 2	<1	30%	Pass
Cadmium	M19-Oc19395	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M19-Oc19395	CP	mg/kg	20	20	1.0	30%	Pass
Copper	M19-Oc19395	CP	mg/kg	40	40	<1	30%	Pass
Lead	M19-Oc19395	CP	mg/kg	< 5	< 5	<1	30%	Pass
Mercury	M19-Oc19395	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	M19-Oc19395	CP	mg/kg	120	120	<1	30%	Pass
Zinc	M19-Oc19395	CP	mg/kg	70	70	1.0	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	M19-Oc19404	CP	%	10.0	11	7.0	30%	Pass

**Comments**

V2 Amendments made to Sample ID's as per email request, Harry 11/11

**Sample Integrity**

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

**Qualifier Codes/Comments**

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

**Authorised By**

Harry Bacalis	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Julie Kay	Senior Analyst-Inorganic (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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Senversa Pty Ltd VIC  
Level 6, 15 William St  
Melbourne  
VIC 3000



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: **Lucinda Trickey**

Report **682320-W-V2**

Project name **POM DD**

Project ID **M17571**

Received Date **Oct 10, 2019**

Client Sample ID			<b>QC09</b>
Sample Matrix			<b>Water</b>
Eurofins Sample No.			<b>M19-Oc19408</b>
Date Sampled			<b>Oct 09, 2019</b>
Test/Reference	LOR	Unit	
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
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	< 0.1
<b>BTEX</b>			
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	%	82
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>			
Naphthalene <sup>N02</sup>	0.01	mg/L	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	0.02	mg/L	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	0.05	mg/L	< 0.05
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	< 0.1
<b>Polycyclic Aromatic Hydrocarbons</b>			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene <sup>N07</sup>	0.001	mg/L	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001

<b>Client Sample ID</b>			<b>QC09</b>
<b>Sample Matrix</b>			<b>Water</b>
<b>Eurofins Sample No.</b>			<b>M19-Oc19408</b>
<b>Date Sampled</b>			<b>Oct 09, 2019</b>
Test/Reference	LOR	Unit	
<b>Polycyclic Aromatic Hydrocarbons</b>			
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001
Naphthalene	0.001	mg/L	< 0.001
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001
Total PAH*	0.001	mg/L	< 0.001
2-Fluorobiphenyl (surr.)	1	%	68
p-Terphenyl-d14 (surr.)	1	%	55
<b>Sulphate (as SO4)</b>			
	5	mg/L	< 5
<b>Heavy Metals</b>			
Arsenic	0.001	mg/L	< 0.001
Cadmium	0.0002	mg/L	< 0.0002
Chromium	0.001	mg/L	< 0.001
Copper	0.001	mg/L	< 0.001
Lead	0.001	mg/L	< 0.001
Mercury	0.0001	mg/L	< 0.0001
Nickel	0.001	mg/L	< 0.001
Zinc	0.005	mg/L	< 0.005

**Sample History**

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

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.

<b>Description</b>	<b>Testing Site</b>	<b>Extracted</b>	<b>Holding Time</b>
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Oct 15, 2019	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Oct 15, 2019	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Oct 15, 2019	
<b>BTEX and Naphthalene</b>			
<b>BTEX</b> - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Oct 15, 2019	14 Days
<b>Polycyclic Aromatic Hydrocarbons</b> - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Oct 15, 2019	7 Days
<b>Sulphate (as SO<sub>4</sub>)</b> - Method: LTM-INO-4110 Sulfate by Discrete Analyser	Melbourne	Oct 15, 2019	28 Days
<b>Heavy Metals</b> - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Oct 15, 2019	180 Days

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<b>Address:</b> Level 6, 15 William St Melbourne VIC 3000	<b>Report #:</b> 682320	<b>Due:</b> Oct 17, 2019
<b>Project Name:</b> POM DD	<b>Phone:</b> 9606 0070	<b>Priority:</b> 5 Day
<b>Project ID:</b> M17571	<b>Fax:</b>	<b>Contact Name:</b> Lucinda Trickey

**Eurofins Analytical Services Manager : Harry Bacalis**

Sample Detail						Arsenic	Cadmium	Chromium	Copper	HOLD	Lead	Mercury	Nickel	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	Zinc	Polycyclic Aromatic Hydrocarbons	BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>																				
<b>Brisbane Laboratory - NATA Site # 20794</b>																				
<b>Perth Laboratory - NATA Site # 23736</b>																				
<b>External Laboratory</b>																				
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID															
1	SB09_0.1-0.2	Oct 09, 2019		Soil	M19-Oc19394	X	X	X	X		X	X	X	X	X	X	X	X	X	X
2	SB09_1.5-1.6	Oct 09, 2019		Soil	M19-Oc19395	X	X	X	X		X	X	X	X	X	X	X	X	X	X
3	SB08_0.1-0.2	Oct 09, 2019		Soil	M19-Oc19396	X	X	X	X		X	X	X	X	X	X	X	X	X	X
4	SB08_1.0-1.1	Oct 09, 2019		Soil	M19-Oc19397	X	X	X	X		X	X	X	X	X	X	X	X	X	X
5	SB10_0.1-0.2	Oct 09, 2019		Soil	M19-Oc19398	X	X	X	X		X	X	X	X	X	X	X	X	X	X
6	SB10_1.0-1.1	Oct 09, 2019		Soil	M19-Oc19399	X	X	X	X		X	X	X	X	X	X	X	X	X	X
7	SB07_0.1-0.2	Oct 09, 2019		Soil	M19-Oc19400	X	X	X	X		X	X	X	X	X	X	X	X	X	X
8	SB07_1.5-1.6	Oct 09, 2019		Soil	M19-Oc19401	X	X	X	X		X	X	X	X	X	X	X	X	X	X
9	SB06_0.1-0.2	Oct 09, 2019		Soil	M19-Oc19402	X	X	X	X		X	X	X	X	X	X	X	X	X	X

<b>Company Name:</b>	Senversa Pty Ltd VIC	<b>Order No.:</b>		<b>Received:</b>	Oct 10, 2019 5:29 PM
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<b>Project Name:</b>	POM DD	<b>Phone:</b>	9606 0070	<b>Priority:</b>	5 Day
<b>Project ID:</b>	M17571	<b>Fax:</b>		<b>Contact Name:</b>	Lucinda Trickey

**Eurofins Analytical Services Manager : Harry Bacalis**

Sample Detail						Arsenic	Cadmium	Chromium	Copper	HOLD	Lead	Mercury	Nickel	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	Zinc	Polycyclic Aromatic Hydrocarbons	BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>																				
<b>Brisbane Laboratory - NATA Site # 20794</b>																				
<b>Perth Laboratory - NATA Site # 23736</b>																				
10	SB06_1.5-1.6	Oct 09, 2019		Soil	M19-Oc19403	X	X	X	X		X	X	X	X	X	X	X	X	X	X
11	SB05_0.5-0.6	Oct 09, 2019		Soil	M19-Oc19404	X	X	X	X		X	X	X	X	X	X	X	X	X	X
12	SB05_0.9-1.0	Oct 09, 2019		Soil	M19-Oc19405	X	X	X	X		X	X	X	X	X	X	X	X	X	X
13	SB11_0.9-1.0	Oct 09, 2019		Soil	M19-Oc19406	X	X	X	X		X	X	X	X	X	X	X	X	X	X
14	QC05	Oct 09, 2019		Soil	M19-Oc19407	X	X	X	X		X	X	X	X	X	X	X	X	X	X
15	QC09	Oct 09, 2019		Water	M19-Oc19408	X	X	X	X		X	X	X		X	X	X	X		X
16	SP09_0.5-0.6	Oct 09, 2019		Soil	M19-Oc19409					X										
17	SP09_1.0-1.1	Oct 09, 2019		Soil	M19-Oc19410					X										
18	SP09_2.0-2.1	Oct 09, 2019		Soil	M19-Oc19411					X										
19	SP08_0.5-0.6	Oct 09, 2019		Soil	M19-Oc19412					X										
20	SP08_1.5-1.6	Oct 09, 2019		Soil	M19-Oc19413					X										
21	SP08_1.9-2.0	Oct 09, 2019		Soil	M19-Oc19414					X										

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	<b>Phone:</b> 9606 0070	<b>Priority:</b> 5 Day
	<b>Fax:</b>	<b>Contact Name:</b> Lucinda Trickey
<b>Project Name:</b> POM DD	<b>Eurofins Analytical Services Manager : Harry Bacalis</b>	
<b>Project ID:</b> M17571		

Sample Detail						Arsenic	Cadmium	Chromium	Copper	HOLD	Lead	Mercury	Nickel	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	Zinc	Polycyclic Aromatic Hydrocarbons	BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>																				
<b>Brisbane Laboratory - NATA Site # 20794</b>																				
<b>Perth Laboratory - NATA Site # 23736</b>																				
22	SP10_0.5-0.6	Oct 09, 2019		Soil	M19-Oc19415					X										
23	SP10_1.5-1.6	Oct 09, 2019		Soil	M19-Oc19416					X										
24	SP10_1.9-2.0	Oct 09, 2019		Soil	M19-Oc19417					X										
25	SP07_0.5-0.6	Oct 09, 2019		Soil	M19-Oc19418					X										
26	SP07_1.0-1.1	Oct 09, 2019		Soil	M19-Oc19419					X										
27	SP07_1.9-2.0	Oct 09, 2019		Soil	M19-Oc19420					X										
28	SP06_0.5-0.6	Oct 09, 2019		Soil	M19-Oc19421					X										
29	SP06_1.0-1.1	Oct 09, 2019		Soil	M19-Oc19422					X										
30	SP06_1.9-2.0	Oct 09, 2019		Soil	M19-Oc19423					X										
31	SP05_1.5-1.6	Oct 09, 2019		Soil	M19-Oc19424					X										
32	SP05_1.9-2.0	Oct 09, 2019		Soil	M19-Oc19425					X										
33	SP11_0.5-0.6	Oct 09, 2019		Soil	M19-Oc19426					X										

<b>Company Name:</b> Senversa Pty Ltd VIC	<b>Order No.:</b>	<b>Received:</b> Oct 10, 2019 5:29 PM
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**Eurofins Analytical Services Manager : Harry Bacalis**

Sample Detail				Arsenic	Cadmium	Chromium	Copper	HOLD	Lead	Mercury	Nickel	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	Zinc	Polycyclic Aromatic Hydrocarbons	BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>																		
<b>Brisbane Laboratory - NATA Site # 20794</b>																		
<b>Perth Laboratory - NATA Site # 23736</b>																		
34	QC01	Oct 09, 2019	Soil					X										
<b>Test Counts</b>				15	15	15	15	19	15	15	15	14	15	15	15	15	14	15

**Internal Quality Control Review and Glossary**
**General**

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

**Holding Times**

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

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

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

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

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

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

**Units**

**mg/kg:** milligrams per kilogram

**mg/L:** milligrams per litre

**ug/L:** micrograms per litre

**ppm:** Parts per million

**ppb:** Parts per billion

**%:** Percentage

**org/100mL:** Organisms per 100 millilitres

**NTU:** Nephelometric Turbidity Units

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

**Terms**

<b>Dry</b>	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
<b>LOR</b>	Limit of Reporting.
<b>SPIKE</b>	Addition of the analyte to the sample and reported as percentage recovery.
<b>RPD</b>	Relative Percent Difference between two Duplicate pieces of analysis.
<b>LCS</b>	Laboratory Control Sample - reported as percent recovery.
<b>CRM</b>	Certified Reference Material - reported as percent recovery.
<b>Method Blank</b>	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.
<b>Surr - Surrogate</b>	The addition of a like compound to the analyte target and reported as percentage recovery.
<b>Duplicate</b>	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
<b>USEPA</b>	United States Environmental Protection Agency
<b>APHA</b>	American Public Health Association
<b>TCLP</b>	Toxicity Characteristic Leaching Procedure
<b>COC</b>	Chain of Custody
<b>SRA</b>	Sample Receipt Advice
<b>QSM</b>	US Department of Defense Quality Systems Manual Version 5.3
<b>CP</b>	Client Parent - QC was performed on samples pertaining to this report
<b>NCP</b>	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.
<b>TEQ</b>	Toxic Equivalency Quotient

**QC - Acceptance Criteria**

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

Results <10 times the LOR : No Limit

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

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

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

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

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

**QC Data General Comments**

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

**Quality Control Results**

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Method Blank</b>							
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>							
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	
<b>Method Blank</b>							
<b>BTEX</b>							
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	
<b>Method Blank</b>							
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>							
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	
<b>Method Blank</b>							
<b>Polycyclic Aromatic Hydrocarbons</b>							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
<b>Method Blank</b>							
Sulphate (as SO4)	mg/L	< 5			5	Pass	
<b>Method Blank</b>							
<b>Heavy Metals</b>							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
<b>LCS - % Recovery</b>							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>								
TRH C6-C9	%	113			70-130	Pass		
TRH C10-C14	%	108			70-130	Pass		
<b>LCS - % Recovery</b>								
<b>BTEX</b>								
Benzene	%	105			70-130	Pass		
Toluene	%	117			70-130	Pass		
Ethylbenzene	%	111			70-130	Pass		
m&p-Xylenes	%	104			70-130	Pass		
Xylenes - Total	%	105			70-130	Pass		
<b>LCS - % Recovery</b>								
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>								
Naphthalene	%	99			70-130	Pass		
TRH C6-C10	%	118			70-130	Pass		
TRH >C10-C16	%	102			70-130	Pass		
<b>LCS - % Recovery</b>								
<b>Polycyclic Aromatic Hydrocarbons</b>								
Acenaphthene	%	90			70-130	Pass		
Acenaphthylene	%	89			70-130	Pass		
Anthracene	%	60			70-130	Fail		
Benz(a)anthracene	%	80			70-130	Pass		
Benzo(a)pyrene	%	80			70-130	Pass		
Benzo(b&j)fluoranthene	%	85			70-130	Pass		
Benzo(g,h,i)perylene	%	105			70-130	Pass		
Benzo(k)fluoranthene	%	94			70-130	Pass		
Chrysene	%	96			70-130	Pass		
Dibenz(a,h)anthracene	%	118			70-130	Pass		
Fluoranthene	%	102			70-130	Pass		
Fluorene	%	90			70-130	Pass		
Indeno(1,2,3-cd)pyrene	%	108			70-130	Pass		
Naphthalene	%	85			70-130	Pass		
Phenanthrene	%	94			70-130	Pass		
Pyrene	%	99			70-130	Pass		
<b>LCS - % Recovery</b>								
Sulphate (as SO4)	%	107			70-130	Pass		
<b>LCS - % Recovery</b>								
<b>Heavy Metals</b>								
Arsenic	%	95			80-120	Pass		
Cadmium	%	93			80-120	Pass		
Chromium	%	88			80-120	Pass		
Copper	%	91			80-120	Pass		
Lead	%	89			80-120	Pass		
Mercury	%	89			75-125	Pass		
Nickel	%	92			80-120	Pass		
Zinc	%	96			80-120	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
<b>Spike - % Recovery</b>								
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1				
TRH C6-C9	M19-Oc20510	NCP	%	123		70-130	Pass	
TRH C10-C14	M19-Oc15993	NCP	%	103		70-130	Pass	
<b>Spike - % Recovery</b>								
<b>BTEX</b>				Result 1				
Benzene	M19-Oc20510	NCP	%	111		70-130	Pass	
Toluene	M19-Oc20510	NCP	%	115		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Ethylbenzene	M19-Oc20510	NCP	%	123			70-130	Pass	
m&p-Xylenes	M19-Oc20510	NCP	%	115			70-130	Pass	
o-Xylene	M19-Oc20510	NCP	%	117			70-130	Pass	
Xylenes - Total	M19-Oc20510	NCP	%	116			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1					
Naphthalene	M19-Oc20510	NCP	%	90			70-130	Pass	
TRH C6-C10	M19-Oc20510	NCP	%	127			70-130	Pass	
TRH >C10-C16	M19-Oc15993	NCP	%	96			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Polycyclic Aromatic Hydrocarbons</b>				Result 1					
Acenaphthene	M19-Oc19408	CP	%	98			70-130	Pass	
Acenaphthylene	M19-Oc19408	CP	%	93			70-130	Pass	
Anthracene	B19-Oc15953	NCP	%	92			70-130	Pass	
Benz(a)anthracene	M19-Oc19408	CP	%	84			70-130	Pass	
Benzo(a)pyrene	M19-Oc19408	CP	%	91			70-130	Pass	
Benzo(b&j)fluoranthene	M19-Oc19408	CP	%	86			70-130	Pass	
Benzo(g,h,i)perylene	M19-Oc19408	CP	%	116			70-130	Pass	
Benzo(k)fluoranthene	M19-Oc19408	CP	%	105			70-130	Pass	
Chrysene	M19-Oc19408	CP	%	102			70-130	Pass	
Dibenz(a,h)anthracene	M19-Oc19408	CP	%	84			70-130	Pass	
Fluoranthene	M19-Oc19408	CP	%	109			70-130	Pass	
Fluorene	M19-Oc19408	CP	%	101			70-130	Pass	
Indeno(1,2,3-cd)pyrene	M19-Oc19408	CP	%	107			70-130	Pass	
Naphthalene	M19-Oc19408	CP	%	98			70-130	Pass	
Phenanthrene	M19-Oc19408	CP	%	94			70-130	Pass	
Pyrene	M19-Oc19408	CP	%	111			70-130	Pass	
<b>Spike - % Recovery</b>									
				Result 1					
Sulphate (as SO4)	M19-Oc19408	CP	%	111			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Heavy Metals</b>				Result 1					
Arsenic	M19-Oc20526	NCP	%	97			75-125	Pass	
Cadmium	M19-Oc20526	NCP	%	94			75-125	Pass	
Chromium	M19-Oc20526	NCP	%	96			75-125	Pass	
Copper	M19-Oc20526	NCP	%	95			75-125	Pass	
Lead	M19-Oc20526	NCP	%	96			75-125	Pass	
Mercury	M19-Oc20526	NCP	%	103			70-130	Pass	
Nickel	M19-Oc20526	NCP	%	95			75-125	Pass	
Zinc	M19-Oc20526	NCP	%	97			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Duplicate</b>									
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1	Result 2	RPD			
TRH C6-C9	M19-Oc20516	NCP	mg/L	0.19	0.20	6.0	30%	Pass	
TRH C10-C14	M19-Oc15992	NCP	mg/L	0.07	0.06	20	30%	Pass	
TRH C15-C28	M19-Oc15992	NCP	mg/L	0.1	0.1	5.0	30%	Pass	
TRH C29-C36	M19-Oc15992	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
<b>Duplicate</b>									
<b>BTEX</b>				Result 1	Result 2	RPD			
Benzene	M19-Oc20516	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M19-Oc20516	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M19-Oc20516	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M19-Oc20516	NCP	mg/L	0.002	0.002	2.0	30%	Pass	
o-Xylene	M19-Oc20516	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M19-Oc20516	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

<b>Duplicate</b>								
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1	Result 2	RPD		
Naphthalene	M19-Oc20516	NCP	mg/L	0.02	0.02	5.0	30%	Pass
TRH C6-C10	M19-Oc20516	NCP	mg/L	0.46	0.49	6.0	30%	Pass
TRH >C10-C16	M19-Oc15992	NCP	mg/L	0.07	0.06	26	30%	Pass
TRH >C16-C34	M19-Oc15992	NCP	mg/L	0.1	0.1	9.0	30%	Pass
TRH >C34-C40	M19-Oc15992	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass
<b>Duplicate</b>								
<b>Polycyclic Aromatic Hydrocarbons</b>				Result 1	Result 2	RPD		
Acenaphthene	B19-Oc15952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Acenaphthylene	B19-Oc15952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Anthracene	B19-Oc15952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benz(a)anthracene	B19-Oc15952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(a)pyrene	B19-Oc15952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(b&j)fluoranthene	B19-Oc15952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(g,h,i)perylene	B19-Oc15952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(k)fluoranthene	B19-Oc15952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Chrysene	B19-Oc15952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Dibenz(a,h)anthracene	B19-Oc15952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Fluoranthene	B19-Oc15952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Fluorene	B19-Oc15952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	B19-Oc15952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Naphthalene	B19-Oc15952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Phenanthrene	B19-Oc15952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Pyrene	B19-Oc15952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
<b>Duplicate</b>								
				Result 1	Result 2	RPD		
Sulphate (as SO4)	M19-Oc14258	NCP	mg/L	39	39	<1	30%	Pass
<b>Duplicate</b>								
<b>Heavy Metals</b>				Result 1	Result 2	RPD		
Arsenic	M19-Oc20526	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Cadmium	M19-Oc20526	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium	M19-Oc20526	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper	M19-Oc20526	NCP	mg/L	0.003	0.003	1.0	30%	Pass
Lead	M19-Oc20526	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Mercury	M19-Oc20526	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel	M19-Oc20526	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Zinc	M19-Oc20526	NCP	mg/L	< 0.005	0.005	9.0	30%	Pass

**Comments**

V2 Amendments made to Sample ID's as per email request, Harry 11/11

**Sample Integrity**

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

**Qualifier Codes/Comments**

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

**Authorised By**

Harry Bacalis	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Julie Kay	Senior Analyst-Inorganic (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 Documentation

Laboratory: ALS VIC  
Address: 2-4 Westall Road, Springvale  
Contact: Larissa Burns / Sample Log In  
Phone: 03 8549 9600

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Job Number: M17571 Purchase Order: M17571  
Project Name: Due Diligence Lease Investigation Quote No:  
Sampled By: S.O'Connor Turn Around Time: Standard  
Project Manager: Lucinda Trickey Page: 1 of 1  
Email Report To: lucinda.trickey@senversa.com.au Phone/Mobile: +61 424 172 065

Sample Information						Container Information		Analysis Required										Comments: e.g. Highly contaminated sample; hazardous materials present; trace LORs etc.		
Lab ID	Sample ID	Matrix *	Date	Time	Type / Code	Total Bottles	TRH, VOCs (W-9 suite)	Sulphate, ammonia, TDS, pH	Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg) (W-2 suite)	TRH C6-C9 and BTEXN (W-18 Suite)	Sulphate, ammonia, pH									
	MW7020	Water	9/10/2019				X	X	X											
	MW7021	Water	9/10/2019				X	X	X											
	MW7018	Water	9/10/2019				X	X	X											
	MW7016	Water	9/10/2019				X	X	X											
	MW7075	Water	10/10/2019				X	X	X											
	MW7019	Water	10/10/2019				X		X		X									Please filter metals in the lab
	MW7015	Water	10/10/2019				X	X	X											
	QS03	Water	9/10/2019				X	X	X											
	QS04	Water	9/10/2019				X	X	X											Please forward to eurofins
	QS07	Water	9/10/2019							X										
	QS08	Water	9/10/2019				X		X											
	QS11	Water	10/10/2019				X	X	X											
<b>Total</b>							9		11											



197008

Sampler: I attest that proper field sampling procedures in accordance with Senversa standard procedures and/or project specifications were used during the collection of these samples: Sampler Name: Sam O'Connor Signature: [Signature] Date: 11/10/2019

<b>Relinquished By:</b> Name/Signature: Sam O'Connor Of: Senversa Date: 11/10/19 Time: 12:05	<b>Method of Shipment (if applicable):</b> Carrier / Reference #: [Handwritten: RUP 93-JET] Date/Time: [Handwritten: 14/10/19 12:30]	<b>Received by:</b> Name/Signature: [Handwritten: JARMELO] Of: [Handwritten: ALS] Date: 11/10/19 Time: 13:30
Name/Signature: [Handwritten: Scott ALS] Of: [Handwritten: ALS] Date: 14/10/19 Time: 12:30	Carrier / Reference #: [Handwritten: 93-JET] Date/Time: [Handwritten: 14/10/19 12:30]	Name/Signature: [Handwritten: GANH] Of: [Handwritten: EUROFINS counter] Date: 14/10 Time: 1:55pm

Water Container Codes: P = Unpreserved Plastic; N = Nitric Acid (HNO<sub>3</sub>) Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide (NaOH)/Cadmium (Cd) Preserved; S = Sodium Hydroxide Preserved Plastic; STH = Sodium thiosulfate preserved plastic; V = VOA Vial Hydrochloric Acid (HCl) Preserved; VS = VOA Vial Sulphuric Preserved; VSA = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulphuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; UA = Unpreserved Amber Glass; L=Lugof's iodine preserved white plastic bottle; SW= sulfuric acid preserved wide mouth glass jar

Moldebeave 682367

**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: **Senversa Pty Ltd VIC**  
Contact name: Lucinda Trickey  
Project name: DUE DILIGENCE LEASE INVESTIGATION  
Project ID: M17571  
COC number: Not provided  
Turn around time: 5 Day  
Date/Time received: Oct 14, 2019 1:55 PM  
Eurofins reference: **682367**

### Sample information

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 2.6 degrees Celsius.
- 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:

Harry Bacalis on Phone : or by e.mail: HarryBacalis@eurofins.com

Results will be delivered electronically via e.mail to Lucinda Trickey - Lucinda.Trickey@senversa.com.au.



Senversa Pty Ltd VIC  
Level 6, 15 William St  
Melbourne  
VIC 3000



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: **Lucinda Trickey**

Report **682367-W**  
Project name **DUE DILIGENCE LEASE INVESTIGATION**  
Project ID **M17571**  
Received Date **Oct 14, 2019**

Client Sample ID			<b>QS04</b>
Sample Matrix			<b>Water</b>
Eurofins Sample No.			<b>M19-Oc19971</b>
Date Sampled			<b>Oct 09, 2019</b>
Test/Reference	LOR	Unit	
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
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	< 0.1
<b>Volatile Organics</b>			
1.1-Dichloroethane	0.001	mg/L	< 0.001
1.1-Dichloroethene	0.001	mg/L	< 0.001
1.1.1-Trichloroethane	0.001	mg/L	< 0.001
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001
1.1.2-Trichloroethane	0.001	mg/L	< 0.001
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001
1.2-Dibromoethane	0.001	mg/L	< 0.001
1.2-Dichlorobenzene	0.001	mg/L	< 0.001
1.2-Dichloroethane	0.001	mg/L	< 0.001
1.2-Dichloropropane	0.001	mg/L	< 0.001
1.2.3-Trichloropropane	0.001	mg/L	< 0.001
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001
1.3-Dichlorobenzene	0.001	mg/L	< 0.001
1.3-Dichloropropane	0.001	mg/L	< 0.001
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001
1.4-Dichlorobenzene	0.001	mg/L	< 0.001
2-Butanone (MEK)	0.001	mg/L	< 0.001
2-Propanone (Acetone)	0.001	mg/L	< 0.001
4-Chlorotoluene	0.001	mg/L	< 0.001
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	< 0.001
Allyl chloride	0.001	mg/L	< 0.001
Benzene	0.001	mg/L	< 0.001
Bromobenzene	0.001	mg/L	< 0.001
Bromochloromethane	0.001	mg/L	< 0.001
Bromodichloromethane	0.001	mg/L	< 0.001
Bromoform	0.001	mg/L	< 0.001
Bromomethane	0.001	mg/L	< 0.001
Carbon disulfide	0.001	mg/L	< 0.001
Carbon Tetrachloride	0.001	mg/L	< 0.001

<b>Client Sample ID</b>			<b>QS04</b>
<b>Sample Matrix</b>			<b>Water</b>
<b>Eurofins Sample No.</b>			<b>M19-Oc19971</b>
<b>Date Sampled</b>			<b>Oct 09, 2019</b>
Test/Reference	LOR	Unit	
<b>Volatile Organics</b>			
Chlorobenzene	0.001	mg/L	< 0.001
Chloroethane	0.001	mg/L	< 0.001
Chloroform	0.005	mg/L	< 0.005
Chloromethane	0.001	mg/L	< 0.001
cis-1.2-Dichloroethene	0.001	mg/L	< 0.001
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001
Dibromochloromethane	0.001	mg/L	< 0.001
Dibromomethane	0.001	mg/L	< 0.001
Dichlorodifluoromethane	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
Iodomethane	0.001	mg/L	< 0.001
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
Methylene Chloride	0.001	mg/L	< 0.001
o-Xylene	0.001	mg/L	< 0.001
Styrene	0.001	mg/L	< 0.001
Tetrachloroethene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001
Trichloroethene	0.001	mg/L	< 0.001
Trichlorofluoromethane	0.001	mg/L	< 0.001
Vinyl chloride	0.001	mg/L	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003
Total MAH*	0.003	mg/L	< 0.003
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	< 0.005
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	< 0.005
4-Bromofluorobenzene (surr.)	1	%	107
Toluene-d8 (surr.)	1	%	105
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>			
Naphthalene <sup>N02</sup>	0.01	mg/L	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	0.02	mg/L	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	0.05	mg/L	< 0.05
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	< 0.1
<b>Ammonia (as N)</b>			
Ammonia (as N)	0.01	mg/L	0.52
<b>pH (at 25°C)</b>			
pH (at 25°C)	0.1	pH Units	6.4
<b>Sulphate (as SO4)</b>			
Sulphate (as SO4)	5	mg/L	1600
<b>Total Dissolved Solids Dried at 180°C ± 2°C</b>			
Total Dissolved Solids Dried at 180°C ± 2°C	10	mg/L	17000
<b>Heavy Metals</b>			
Arsenic (filtered)	0.001	mg/L	0.002
Cadmium (filtered)	0.0002	mg/L	< 0.0002
Chromium (filtered)	0.001	mg/L	0.002
Copper (filtered)	0.001	mg/L	0.031
Lead (filtered)	0.001	mg/L	< 0.001

<b>Client Sample ID</b>			<b>QS04</b>
<b>Sample Matrix</b>			<b>Water</b>
<b>Eurofins Sample No.</b>			<b>M19-Oc19971</b>
<b>Date Sampled</b>			<b>Oct 09, 2019</b>
Test/Reference	LOR	Unit	
<b>Heavy Metals</b>			
Mercury (filtered)	0.0001	mg/L	< 0.0001
Nickel (filtered)	0.001	mg/L	0.052
Zinc (filtered)	0.005	mg/L	0.16

**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.

<b>Description</b>	<b>Testing Site</b>	<b>Extracted</b>	<b>Holding Time</b>
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Oct 21, 2019	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Oct 21, 2019	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Oct 21, 2019	
Volatile Organics - Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices (USEPA 8260)	Melbourne	Oct 15, 2019	7 Days
Ammonia (as N) - Method: LTM-INO-4200 Ammonia by Discrete Analyser	Melbourne	Oct 15, 2019	28 Days
pH (at 25°C) - Method: LTM-GEN-7090 pH in water by ISE	Melbourne	Oct 15, 2019	0 Hours
Sulphate (as SO <sub>4</sub> ) - Method: LTM-INO-4110 Sulfate by Discrete Analyser	Melbourne	Oct 15, 2019	28 Days
Total Dissolved Solids Dried at 180°C ± 2°C - Method: LTM-INO-4170 Total Dissolved Solids in Water	Melbourne	Oct 15, 2019	7 Days
Heavy Metals (filtered) - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Oct 15, 2019	180 Days
Mobil Metals : Metals M15 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Oct 15, 2019	28 Days

<b>Company Name:</b>	Senversa Pty Ltd VIC	<b>Order No.:</b>	M17571	<b>Received:</b>	Oct 14, 2019 1:55 PM
<b>Address:</b>	Level 6, 15 William St Melbourne VIC 3000	<b>Report #:</b>	682367	<b>Due:</b>	Oct 21, 2019
<b>Project Name:</b>	DUE DILIGENCE LEASE INVESTIGATION	<b>Phone:</b>	9606 0070	<b>Priority:</b>	5 Day
<b>Project ID:</b>	M17571	<b>Fax:</b>		<b>Contact Name:</b>	Lucinda Trickey

**Eurofins Analytical Services Manager : Harry Bacalis**

Sample Detail						Ammonia (as N)	Arsenic (filtered)	Cadmium (filtered)	Chromium (filtered)	Copper (filtered)	Lead (filtered)	Mercury (filtered)	Nickel (filtered)	pH (at 25°C)	Sulphate (as SO4)	Total Dissolved Solids Dried at 180°C ± 2°C	Zinc (filtered)	Volatile Organics	Total Recoverable Hydrocarbons
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>						X	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>																			
<b>Brisbane Laboratory - NATA Site # 20794</b>																			
<b>Perth Laboratory - NATA Site # 23736</b>																			
<b>External Laboratory</b>																			
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID														
1	QS04	Oct 09, 2019		Water	M19-Oc19971	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>Test Counts</b>						1	1	1	1	1	1	1	1	1	1	1	1	1	1

**Internal Quality Control Review and Glossary**
**General**

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

**Holding Times**

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

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

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

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

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

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

**Units**

**mg/kg:** milligrams per kilogram

**mg/L:** milligrams per litre

**ug/L:** micrograms per litre

**ppm:** Parts per million

**ppb:** Parts per billion

**%:** Percentage

**org/100mL:** Organisms per 100 millilitres

**NTU:** Nephelometric Turbidity Units

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

**Terms**

<b>Dry</b>	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
<b>LOR</b>	Limit of Reporting.
<b>SPIKE</b>	Addition of the analyte to the sample and reported as percentage recovery.
<b>RPD</b>	Relative Percent Difference between two Duplicate pieces of analysis.
<b>LCS</b>	Laboratory Control Sample - reported as percent recovery.
<b>CRM</b>	Certified Reference Material - reported as percent recovery.
<b>Method Blank</b>	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.
<b>Surr - Surrogate</b>	The addition of a like compound to the analyte target and reported as percentage recovery.
<b>Duplicate</b>	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
<b>USEPA</b>	United States Environmental Protection Agency
<b>APHA</b>	American Public Health Association
<b>TCLP</b>	Toxicity Characteristic Leaching Procedure
<b>COC</b>	Chain of Custody
<b>SRA</b>	Sample Receipt Advice
<b>QSM</b>	US Department of Defense Quality Systems Manual Version 5.3
<b>CP</b>	Client Parent - QC was performed on samples pertaining to this report
<b>NCP</b>	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.
<b>TEQ</b>	Toxic Equivalency Quotient

**QC - Acceptance Criteria**

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

Results <10 times the LOR : No Limit

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

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

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

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

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

**QC Data General Comments**

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

**Quality Control Results**

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Method Blank</b>							
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>							
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	
<b>Method Blank</b>							
<b>Volatile Organics</b>							
1.1-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
1.1.1-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.1.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dibromoethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.2-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.3-Trichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.4-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.3.5-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.4-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
2-Butanone (MEK)	mg/L	< 0.001			0.001	Pass	
2-Propanone (Acetone)	mg/L	< 0.001			0.001	Pass	
4-Chlorotoluene	mg/L	< 0.001			0.001	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.001			0.001	Pass	
Allyl chloride	mg/L	< 0.001			0.001	Pass	
Benzene	mg/L	< 0.001			0.001	Pass	
Bromobenzene	mg/L	< 0.001			0.001	Pass	
Bromochloromethane	mg/L	< 0.001			0.001	Pass	
Bromodichloromethane	mg/L	< 0.001			0.001	Pass	
Bromoform	mg/L	< 0.001			0.001	Pass	
Bromomethane	mg/L	< 0.001			0.001	Pass	
Carbon disulfide	mg/L	< 0.001			0.001	Pass	
Carbon Tetrachloride	mg/L	< 0.001			0.001	Pass	
Chlorobenzene	mg/L	< 0.001			0.001	Pass	
Chloroethane	mg/L	< 0.001			0.001	Pass	
Chloroform	mg/L	< 0.005			0.005	Pass	
Chloromethane	mg/L	< 0.001			0.001	Pass	
cis-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Dibromochloromethane	mg/L	< 0.001			0.001	Pass	
Dibromomethane	mg/L	< 0.001			0.001	Pass	
Dichlorodifluoromethane	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
Methylene Chloride	mg/L	< 0.001			0.001	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Styrene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
trans-1,2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
trans-1,3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Trichloroethene	mg/L	< 0.001			0.001	Pass	
Trichlorofluoromethane	mg/L	< 0.001			0.001	Pass	
Vinyl chloride	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
<b>Method Blank</b>							
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>							
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	
<b>Method Blank</b>							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Sulphate (as SO <sub>4</sub> )	mg/L	< 5			5	Pass	
Total Dissolved Solids Dried at 180°C ± 2°C	mg/L	< 10			10	Pass	
<b>Method Blank</b>							
<b>Heavy Metals</b>							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
<b>LCS - % Recovery</b>							
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>							
TRH C6-C9	%	111			70-130	Pass	
TRH C10-C14	%	99			70-130	Pass	
<b>LCS - % Recovery</b>							
<b>Volatile Organics</b>							
1,1-Dichloroethene	%	98			70-130	Pass	
1,1,1-Trichloroethane	%	95			70-130	Pass	
1,2-Dichlorobenzene	%	92			70-130	Pass	
1,2-Dichloroethane	%	95			70-130	Pass	
Benzene	%	94			70-130	Pass	
Ethylbenzene	%	91			70-130	Pass	
m&p-Xylenes	%	85			70-130	Pass	
Toluene	%	95			70-130	Pass	
Trichloroethene	%	95			70-130	Pass	
Xylenes - Total	%	85			70-130	Pass	
<b>LCS - % Recovery</b>							
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>							
Naphthalene	%	116			70-130	Pass	
TRH C6-C10	%	114			70-130	Pass	
TRH >C10-C16	%	95			70-130	Pass	
<b>LCS - % Recovery</b>							
Ammonia (as N)	%	105			70-130	Pass	
Sulphate (as SO <sub>4</sub> )	%	104			70-130	Pass	
Total Dissolved Solids Dried at 180°C ± 2°C	%	106			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Spike - % Recovery</b>									
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1					
TRH C6-C9	M19-Oc27750	NCP	%	122			70-130	Pass	
TRH C10-C14	M19-Oc24802	NCP	%	87			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Volatile Organics</b>				Result 1					
Benzene	M19-Oc27750	NCP	%	109			70-130	Pass	
Ethylbenzene	M19-Oc27750	NCP	%	116			70-130	Pass	
m&p-Xylenes	M19-Oc27750	NCP	%	105			70-130	Pass	
o-Xylene	M19-Oc27750	NCP	%	108			70-130	Pass	
Toluene	M19-Oc27750	NCP	%	110			70-130	Pass	
Xylenes - Total	M19-Oc27750	NCP	%	106			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1					
Naphthalene	M19-Oc27750	NCP	%	116			70-130	Pass	
TRH C6-C10	M19-Oc27750	NCP	%	125			70-130	Pass	
TRH >C10-C16	M19-Oc24802	NCP	%	85			70-130	Pass	
<b>Spike - % Recovery</b>									
				Result 1					
Ammonia (as N)	M19-Oc27134	NCP	%	97			70-130	Pass	
Sulphate (as SO4)	M19-Oc15795	NCP	%	106			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Heavy Metals</b>				Result 1					
Arsenic (filtered)	M19-Oc21375	NCP	%	80			70-130	Pass	
Cadmium (filtered)	M19-Oc21375	NCP	%	88			70-130	Pass	
Chromium (filtered)	M19-Oc21375	NCP	%	86			70-130	Pass	
Copper (filtered)	M19-Oc21375	NCP	%	80			70-130	Pass	
Lead (filtered)	M19-Oc21375	NCP	%	86			70-130	Pass	
Mercury (filtered)	M19-Oc21375	NCP	%	89			70-130	Pass	
Nickel (filtered)	M19-Oc21375	NCP	%	82			70-130	Pass	
Zinc (filtered)	M19-Oc21375	NCP	%	81			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Duplicate</b>									
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1	Result 2	RPD			
TRH C6-C9	M19-Oc27747	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M19-Oc27550	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M19-Oc27550	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M19-Oc27550	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
<b>Duplicate</b>									
<b>Volatile Organics</b>				Result 1	Result 2	RPD			
Benzene	M19-Oc27747	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M19-Oc27747	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M19-Oc27747	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M19-Oc27747	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M19-Oc27747	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M19-Oc27747	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
<b>Duplicate</b>									
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1	Result 2	RPD			
Naphthalene	M19-Oc27747	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M19-Oc27747	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	M19-Oc27550	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M19-Oc27550	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M19-Oc27550	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

<b>Duplicate</b>								
				Result 1	Result 2	RPD		
Ammonia (as N)	M19-Oc27134	NCP	mg/L	0.17	0.18	5.0	30%	Pass
pH (at 25°C)	M19-Oc19165	NCP	pH Units	5.9	5.8	pass	30%	Pass
Sulphate (as SO <sub>4</sub> )	B19-Oc18461	NCP	mg/L	76	75	1.0	30%	Pass
Total Dissolved Solids Dried at 180°C ± 2°C	M19-Oc17975	NCP	mg/L	3500	3600	4.0	30%	Pass
<b>Duplicate</b>								
<b>Heavy Metals</b>				Result 1	Result 2	RPD		
Arsenic (filtered)	M19-Oc21375	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Cadmium (filtered)	M19-Oc21375	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium (filtered)	M19-Oc21375	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper (filtered)	M19-Oc21375	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Lead (filtered)	M19-Oc21375	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Mercury (filtered)	M19-Oc21375	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel (filtered)	M19-Oc21375	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Zinc (filtered)	M19-Oc21375	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass

**Comments**
**Sample Integrity**

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

**Qualifier Codes/Comments**

Code	Description
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**

Harry Bacalis	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Julie Kay	Senior Analyst-Inorganic (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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## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>EM1917008</b> <b>Amendment</b> : <b>1</b> <b>Client</b> : <b>SENVERSA PTY LTD</b> <b>Contact</b> : <b>LUCINDA TRICKEY</b> <b>Address</b> : <b>Level 6, 15 William St</b> <b>Melbourne VICTORIA, AUSTRALIA 3000</b> <b>Telephone</b> : <b>+61 03 9606 0070</b> <b>Project</b> : <b>M17571</b> <b>Order number</b> : <b>M17571</b> <b>C-O-C number</b> : <b>----</b> <b>Sampler</b> : <b>SAM O'CONNOR</b> <b>Site</b> : <b>----</b> <b>Quote number</b> : <b>EN/103/18 (primary work only)</b> <b>No. of samples received</b> : <b>11</b> <b>No. of samples analysed</b> : <b>11</b>	<b>Page</b> : 1 of 17  <b>Laboratory</b> : Environmental Division Melbourne <b>Contact</b> : Larissa Burns <b>Address</b> : 4 Westall Rd Springvale VIC Australia 3171  <b>Telephone</b> : +6138549 9644 <b>Date Samples Received</b> : 11-Oct-2019 13:30 <b>Date Analysis Commenced</b> : 14-Oct-2019 <b>Issue Date</b> : 24-Oct-2019 16:58
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Accreditation No. 825  
Accredited for compliance with  
ISO/IEC 17025 - Testing

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

### *Signatories*

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Andrew Lu	VOC Section Supervisor	Melbourne Organics, Springvale, VIC
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC



## General Comments

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

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

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

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

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

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

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

- EP080/074: Particular sample EM1917008-005 shows minor BTEX hits. Confirmed by re-analysis.
- Sample MW7019 was filtered through a 0.45um filter prior to the dissolved metals analysis. As the sample was preserved prior to filtration however, please bear in mind the high likelihood for dissolved metals to bias high due to the potential dissolution of particulate matter.
- Amendment (23/10/19: This report has been amended and re-released to allow the reporting of additional analytical data.
- EA015H: EM1917008 #4: TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	MW7020	MW7021	MW7018	MW7016	MW7075
Client sampling date / time				09-Oct-2019 00:00	09-Oct-2019 00:00	09-Oct-2019 00:00	09-Oct-2019 00:00	10-Oct-2019 00:00	
Compound	CAS Number	LOR	Unit	EM1917008-001	EM1917008-002	EM1917008-003	EM1917008-004	EM1917008-005	
				Result	Result	Result	Result	Result	
<b>EA005P: pH by PC Titrator</b>									
pH Value	----	0.01	pH Unit	6.02	5.88	6.00	6.74	6.99	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>									
Total Dissolved Solids @180°C	----	10	mg/L	2400	4270	18100	970	460	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	270	835	1440	121	24	
<b>EG020F: Dissolved Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.002	0.022	0.003	
Cadmium	7440-43-9	0.0001	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.002	0.001	<0.001	
Copper	7440-50-8	0.001	mg/L	0.011	0.007	0.040	0.002	0.003	
Nickel	7440-02-0	0.001	mg/L	0.024	0.030	0.062	0.012	0.004	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Zinc	7440-66-6	0.005	mg/L	0.084	0.072	0.202	0.030	0.019	
<b>EG035F: Dissolved Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	1.89	0.19	0.64	0.02	1.88	
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>									
Styrene	100-42-5	5	µg/L	<5	<5	<5	<5	<5	
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	<5	<5	<5	
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	<5	<5	<5	
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	<5	<5	<5	
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	<5	<5	<5	
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	<5	<5	<5	
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	<5	<5	<5	
p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	<5	<5	<5	
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	<5	<5	<5	
<b>EP074B: Oxygenated Compounds</b>									
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	<50	<50	<50	
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	<50	<50	<50	
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	<50	<50	<50	
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	<50	<50	<50	
<b>EP074C: Sulfonated Compounds</b>									
Carbon disulfide	75-15-0	5	µg/L	<5	<5	<5	<5	<5	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	MW7020	MW7021	MW7018	MW7016	MW7075
Client sampling date / time					09-Oct-2019 00:00	09-Oct-2019 00:00	09-Oct-2019 00:00	09-Oct-2019 00:00	10-Oct-2019 00:00
Compound	CAS Number	LOR	Unit	EM1917008-001	EM1917008-002	EM1917008-003	EM1917008-004	EM1917008-005	
				Result	Result	Result	Result	Result	
<b>EP074D: Fumigants</b>									
2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	<5	<5	<5	
1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	<5	<5	<5	
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	<5	<5	<5	
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	<5	<5	<5	
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	<5	<5	<5	
<b>EP074E: Halogenated Aliphatic Compounds</b>									
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	<50	<50	<50	
Chloromethane	74-87-3	50	µg/L	<50	<50	<50	<50	<50	
Vinyl chloride	75-01-4	50	µg/L	<50	<50	<50	<50	<50	
Bromomethane	74-83-9	50	µg/L	<50	<50	<50	<50	<50	
Chloroethane	75-00-3	50	µg/L	<50	<50	<50	<50	<50	
Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	<50	<50	<50	
1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	<5	<5	<5	
Iodomethane	74-88-4	5	µg/L	<5	<5	<5	<5	<5	
trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	<5	<5	<5	
1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	<5	<5	<5	
cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	<5	<5	<5	
1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	<5	<5	<5	
1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	<5	<5	<5	
Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	<5	<5	<5	
1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	<5	<5	<5	
Trichloroethene	79-01-6	5	µg/L	<5	<5	<5	<5	<5	
Dibromomethane	74-95-3	5	µg/L	<5	<5	<5	<5	<5	
1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	<5	<5	<5	
1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	<5	<5	<5	
Tetrachloroethene	127-18-4	5	µg/L	<5	<5	<5	<5	<5	
1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	<5	<5	<5	
trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	<5	<5	<5	
cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	<5	<5	<5	
1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	<5	<5	<5	
1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	<5	<5	<5	<5	
Pentachloroethane	76-01-7	5	µg/L	<5	<5	<5	<5	<5	
1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	<5	<5	<5	
Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	<5	<5	<5	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	MW7020	MW7021	MW7018	MW7016	MW7075
Client sampling date / time				09-Oct-2019 00:00	09-Oct-2019 00:00	09-Oct-2019 00:00	09-Oct-2019 00:00	10-Oct-2019 00:00	
Compound	CAS Number	LOR	Unit	EM1917008-001	EM1917008-002	EM1917008-003	EM1917008-004	EM1917008-005	
				Result	Result	Result	Result	Result	
<b>EP074F: Halogenated Aromatic Compounds</b>									
Chlorobenzene	108-90-7	5	µg/L	<5	<5	<5	<5	<5	
Bromobenzene	108-86-1	5	µg/L	<5	<5	<5	<5	<5	
2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	<5	<5	<5	
4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	<5	<5	<5	
1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	<5	<5	<5	
1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	<5	<5	<5	
1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	<5	<5	<5	
1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	<5	<5	<5	
1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	<5	<5	<5	
<b>EP074G: Trihalomethanes</b>									
Chloroform	67-66-3	5	µg/L	<5	<5	<5	<5	<5	
Bromodichloromethane	75-27-4	5	µg/L	<5	<5	<5	<5	<5	
Dibromochloromethane	124-48-1	5	µg/L	<5	<5	<5	<5	<5	
Bromoform	75-25-2	5	µg/L	<5	<5	<5	<5	<5	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20	
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20	
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	1	
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2	
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	MW7020	MW7021	MW7018	MW7016	MW7075
Client sampling date / time					09-Oct-2019 00:00	09-Oct-2019 00:00	09-Oct-2019 00:00	09-Oct-2019 00:00	10-Oct-2019 00:00
Compound	CAS Number	LOR	Unit	EM1917008-001	EM1917008-002	EM1917008-003	EM1917008-004	EM1917008-005	
				Result	Result	Result	Result	Result	
<b>EP080: BTEXN - Continued</b>									
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2	<2
^ Total Xylenes	----	2	µg/L	<2	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1	1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5	<5
<b>EP074S: VOC Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	5	%	106	101	93.3	85.0	93.0	
Toluene-D8	2037-26-5	5	%	109	99.6	87.1	82.0	105	
4-Bromofluorobenzene	460-00-4	5	%	110	108	97.8	94.4	106	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	2	%	124	119	105	93.1	96.1	
Toluene-D8	2037-26-5	2	%	101	91.9	81.8	70.5	102	
4-Bromofluorobenzene	460-00-4	2	%	119	109	103	92.4	110	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	MW7019	MW7015	QS03	QS07	QS08
Client sampling date / time				10-Oct-2019 00:00	10-Oct-2019 00:00	09-Oct-2019 00:00	09-Oct-2019 00:00	09-Oct-2019 00:00	
Compound	CAS Number	LOR	Unit	EM1917008-006	EM1917008-007	EM1917008-008	EM1917008-009	EM1917008-010	
				Result	Result	Result	Result	Result	
<b>EA005P: pH by PC Titrator</b>									
pH Value	----	0.01	pH Unit	----	7.33	6.10	----	----	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>									
Total Dissolved Solids @180°C	----	10	mg/L	----	2700	19000	----	----	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	----	230	1550	----	----	
<b>EG020F: Dissolved Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	0.044	0.015	0.002	----	----	
Cadmium	7440-43-9	0.0001	mg/L	0.0008	<0.0001	<0.0001	----	----	
Chromium	7440-47-3	0.001	mg/L	0.062	0.001	0.002	----	----	
Copper	7440-50-8	0.001	mg/L	0.004	0.001	0.037	----	----	
Nickel	7440-02-0	0.001	mg/L	0.058	0.005	0.060	----	----	
Lead	7439-92-1	0.001	mg/L	0.048	<0.001	<0.001	----	----	
Zinc	7440-66-6	0.005	mg/L	1.15	0.014	0.198	----	----	
<b>EG020T: Total Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	----	----	----	----	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	----	----	----	----	<0.0001	
Chromium	7440-47-3	0.001	mg/L	----	----	----	----	<0.001	
Copper	7440-50-8	0.001	mg/L	----	----	----	----	<0.001	
Nickel	7440-02-0	0.001	mg/L	----	----	----	----	<0.001	
Lead	7439-92-1	0.001	mg/L	----	----	----	----	<0.001	
Zinc	7440-66-6	0.005	mg/L	----	----	----	----	<0.005	
<b>EG035F: Dissolved Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----	
<b>EG035T: Total Recoverable Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	----	----	----	----	<0.0001	
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	3.29	0.72	0.67	----	----	
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>									
Benzene	71-43-2	1	µg/L	<1	----	----	----	----	
Toluene	108-88-3	1	µg/L	<1	----	----	----	----	
Ethylbenzene	100-41-4	1	µg/L	<1	----	----	----	----	
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	----	----	----	----	
Styrene	100-42-5	1	µg/L	<1	----	----	----	----	
Styrene	100-42-5	5	µg/L	<5	<5	<5	----	<5	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	MW7019	MW7015	QS03	QS07	QS08
Client sampling date / time					10-Oct-2019 00:00	10-Oct-2019 00:00	09-Oct-2019 00:00	09-Oct-2019 00:00	09-Oct-2019 00:00
Compound	CAS Number	LOR	Unit	EM1917008-006	EM1917008-007	EM1917008-008	EM1917008-009	EM1917008-010	EM1917008-010
				Result	Result	Result	Result	Result	Result
<b>EP074A: Monocyclic Aromatic Hydrocarbons - Continued</b>									
ortho-Xylene	95-47-6	1	µg/L	<1	----	----	----	----	----
Isopropylbenzene	98-82-8	1	µg/L	<1	----	----	----	----	----
Isopropylbenzene	98-82-8	5	µg/L	<5	<5	<5	----	----	<5
n-Propylbenzene	103-65-1	1	µg/L	<1	----	----	----	----	----
n-Propylbenzene	103-65-1	5	µg/L	<5	<5	<5	----	----	<5
1,3,5-Trimethylbenzene	108-67-8	1	µg/L	<1	----	----	----	----	----
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	<5	----	----	<5
sec-Butylbenzene	135-98-8	1	µg/L	<1	----	----	----	----	----
sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	<5	----	----	<5
1,2,4-Trimethylbenzene	95-63-6	1	µg/L	<1	----	----	----	----	----
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	<5	----	----	<5
tert-Butylbenzene	98-06-6	1	µg/L	<1	----	----	----	----	----
tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	<5	----	----	<5
p-Isopropyltoluene	99-87-6	1	µg/L	<b>79</b>	----	----	----	----	----
p-Isopropyltoluene	99-87-6	5	µg/L	<b>87</b>	<5	<5	----	----	<5
n-Butylbenzene	104-51-8	1	µg/L	<1	----	----	----	----	----
n-Butylbenzene	104-51-8	5	µg/L	<5	<5	<5	----	----	<5
^ Total Xylenes	----	1	µg/L	<1	----	----	----	----	----
<b>EP074B: Oxygenated Compounds</b>									
Vinyl Acetate	108-05-4	10	µg/L	<10	----	----	----	----	----
Vinyl Acetate	108-05-4	50	µg/L	<50	<50	<50	----	----	<50
2-Butanone (MEK)	78-93-3	10	µg/L	<10	----	----	----	----	----
2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	<50	----	----	<50
4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L	<10	----	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	<50	----	----	<50
2-Hexanone (MBK)	591-78-6	10	µg/L	<10	----	----	----	----	----
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	<50	----	----	<50
<b>EP074C: Sulfonated Compounds</b>									
Carbon disulfide	75-15-0	1	µg/L	<1	----	----	----	----	----
Carbon disulfide	75-15-0	5	µg/L	<5	<5	<5	----	----	<5
<b>EP074D: Fumigants</b>									
2,2-Dichloropropane	594-20-7	1	µg/L	<1	----	----	----	----	----
2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	<5	----	----	<5
1,2-Dichloropropane	78-87-5	1	µg/L	<1	----	----	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	MW7019	MW7015	QS03	QS07	QS08
Client sampling date / time					10-Oct-2019 00:00	10-Oct-2019 00:00	09-Oct-2019 00:00	09-Oct-2019 00:00	09-Oct-2019 00:00
Compound	CAS Number	LOR	Unit		EM1917008-006	EM1917008-007	EM1917008-008	EM1917008-009	EM1917008-010
					Result	Result	Result	Result	Result
<b>EP074D: Fumigants - Continued</b>									
1,2-Dichloropropane	78-87-5	5	µg/L		<5	<5	<5	----	<5
cis-1,3-Dichloropropylene	10061-01-5	2	µg/L		<2	----	----	----	----
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L		<5	<5	<5	----	<5
trans-1,3-Dichloropropylene	10061-02-6	2	µg/L		<2	----	----	----	----
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L		<5	<5	<5	----	<5
1,2-Dibromoethane (EDB)	106-93-4	1	µg/L		<1	----	----	----	----
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L		<5	<5	<5	----	<5
<sup>^</sup> 1,3-Dichloropropylene (cis & trans)	----	2	µg/L		<2	----	----	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>									
Dichlorodifluoromethane	75-71-8	10	µg/L		<10	----	----	----	----
Dichlorodifluoromethane	75-71-8	50	µg/L		<50	<50	<50	----	<50
Chloromethane	74-87-3	10	µg/L		<10	----	----	----	----
Chloromethane	74-87-3	50	µg/L		<50	<50	<50	----	<50
Vinyl chloride	75-01-4	0.2	µg/L		<0.2	----	----	----	----
Vinyl chloride	75-01-4	50	µg/L		<50	<50	<50	----	<50
Bromomethane	74-83-9	10	µg/L		<10	----	----	----	----
Bromomethane	74-83-9	50	µg/L		<50	<50	<50	----	<50
Chloroethane	75-00-3	10	µg/L		<10	----	----	----	----
Chloroethane	75-00-3	50	µg/L		<50	<50	<50	----	<50
Trichlorofluoromethane	75-69-4	10	µg/L		<10	----	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L		<50	<50	<50	----	<50
1,1-Dichloroethene	75-35-4	1	µg/L		<1	----	----	----	----
1,1-Dichloroethene	75-35-4	5	µg/L		<5	<5	<5	----	<5
Iodomethane	74-88-4	1	µg/L		<1	----	----	----	----
Iodomethane	74-88-4	5	µg/L		<5	<5	<5	----	<5
Methylene chloride	75-09-2	2	µg/L		<2	----	----	----	----
trans-1,2-Dichloroethene	156-60-5	1	µg/L		<1	----	----	----	----
trans-1,2-Dichloroethene	156-60-5	5	µg/L		<5	<5	<5	----	<5
1,1-Dichloroethane	75-34-3	1	µg/L		1	----	----	----	----
1,1-Dichloroethane	75-34-3	5	µg/L		<5	<5	<5	----	<5
cis-1,2-Dichloroethene	156-59-2	1	µg/L		1	----	----	----	----
cis-1,2-Dichloroethene	156-59-2	5	µg/L		<5	<5	<5	----	<5
1,1,1-Trichloroethane	71-55-6	1	µg/L		<1	----	----	----	----
1,1,1-Trichloroethane	71-55-6	5	µg/L		<5	<5	<5	----	<5
1,1-Dichloropropylene	563-58-6	1	µg/L		<1	----	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	MW7019	MW7015	QS03	QS07	QS08
Client sampling date / time					10-Oct-2019 00:00	10-Oct-2019 00:00	09-Oct-2019 00:00	09-Oct-2019 00:00	09-Oct-2019 00:00
Compound	CAS Number	LOR	Unit	EM1917008-006	EM1917008-007	EM1917008-008	EM1917008-009	EM1917008-010	
				Result	Result	Result	Result	Result	
<b>EP074E: Halogenated Aliphatic Compounds - Continued</b>									
1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	<5	----	<5	
Carbon Tetrachloride	56-23-5	1	µg/L	<1	----	----	----	----	
Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	<5	----	<5	
1.2-Dichloroethane	107-06-2	1	µg/L	<1	----	----	----	----	
1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	<5	----	<5	
Trichloroethene	79-01-6	1	µg/L	<1	----	----	----	----	
Trichloroethene	79-01-6	5	µg/L	<5	<5	<5	----	<5	
Dibromomethane	74-95-3	1	µg/L	<1	----	----	----	----	
Dibromomethane	74-95-3	5	µg/L	<5	<5	<5	----	<5	
1.1.2-Trichloroethane	79-00-5	1	µg/L	<1	----	----	----	----	
1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	<5	----	<5	
1.3-Dichloropropane	142-28-9	1	µg/L	<1	----	----	----	----	
1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	<5	----	<5	
Tetrachloroethene	127-18-4	1	µg/L	<1	----	----	----	----	
Tetrachloroethene	127-18-4	5	µg/L	<5	<5	<5	----	<5	
1.1.1.2-Tetrachloroethane	630-20-6	1	µg/L	<1	----	----	----	----	
1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	<5	----	<5	
trans-1.4-Dichloro-2-butene	110-57-6	1	µg/L	<1	----	----	----	----	
trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	<5	----	<5	
cis-1.4-Dichloro-2-butene	1476-11-5	1	µg/L	<1	----	----	----	----	
cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	<5	----	<5	
1.1.2.2-Tetrachloroethane	79-34-5	1	µg/L	<1	----	----	----	----	
1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	<5	----	<5	
1.2.3-Trichloropropane	96-18-4	1	µg/L	<1	----	----	----	----	
1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	<5	----	<5	
Pentachloroethane	76-01-7	1	µg/L	<1	----	----	----	----	
Pentachloroethane	76-01-7	5	µg/L	<5	<5	<5	----	<5	
1.2-Dibromo-3-chloropropane	96-12-8	1	µg/L	<1	----	----	----	----	
1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	<5	----	<5	
Hexachlorobutadiene	87-68-3	0.5	µg/L	<0.5	----	----	----	----	
Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	<5	----	<5	
Bromochloromethane	74-97-5	1	µg/L	<1	----	----	----	----	
<b>EP074F: Halogenated Aromatic Compounds</b>									
Chlorobenzene	108-90-7	1	µg/L	4	----	----	----	----	
Chlorobenzene	108-90-7	5	µg/L	<5	<5	<5	----	<5	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	MW7019	MW7015	QS03	QS07	QS08
Client sampling date / time					10-Oct-2019 00:00	10-Oct-2019 00:00	09-Oct-2019 00:00	09-Oct-2019 00:00	09-Oct-2019 00:00
Compound	CAS Number	LOR	Unit	EM1917008-006	EM1917008-007	EM1917008-008	EM1917008-009	EM1917008-010	EM1917008-010
				Result	Result	Result	Result	Result	Result
<b>EP074F: Halogenated Aromatic Compounds - Continued</b>									
Bromobenzene	108-86-1	1	µg/L	<1	----	----	----	----	----
Bromobenzene	108-86-1	5	µg/L	<5	<5	<5	----	<5	<5
2-Chlorotoluene	95-49-8	1	µg/L	<1	----	----	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	<5	----	<5	<5
4-Chlorotoluene	106-43-4	1	µg/L	<1	----	----	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	<5	----	<5	<5
1,3-Dichlorobenzene	541-73-1	1	µg/L	<1	----	----	----	----	----
1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	<5	----	<5	<5
1,4-Dichlorobenzene	106-46-7	0.1	µg/L	<b>0.1</b>	----	----	----	----	----
1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	<5	----	<5	<5
1,2-Dichlorobenzene	95-50-1	1	µg/L	<1	----	----	----	----	----
1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	<5	----	<5	<5
1,2,4-Trichlorobenzene	120-82-1	1	µg/L	<1	----	----	----	----	----
1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	<5	----	<5	<5
1,2,3-Trichlorobenzene	87-61-6	1	µg/L	<1	----	----	----	----	----
1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	<5	----	<5	<5
^ Sum of Trichlorobenzenes	----	1	µg/L	<1	----	----	----	----	----
<b>EP074G: Trihalomethanes</b>									
Chloroform	67-66-3	1	µg/L	<1	----	----	----	----	----
Chloroform	67-66-3	5	µg/L	<5	<5	<5	----	<5	<5
Bromodichloromethane	75-27-4	1	µg/L	<1	----	----	----	----	----
Bromodichloromethane	75-27-4	5	µg/L	<5	<5	<5	----	<5	<5
Dibromochloromethane	124-48-1	1	µg/L	<1	----	----	----	----	----
Dibromochloromethane	124-48-1	5	µg/L	<5	<5	<5	----	<5	<5
Bromoform	75-25-2	1	µg/L	<1	----	----	----	----	----
Bromoform	75-25-2	5	µg/L	<5	<5	<5	----	<5	<5
^ Total Trihalomethanes	----	1	µg/L	<1	----	----	----	----	----
<b>EP074H: Naphthalene</b>									
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<b>1050</b>	<50	<50	----	<50	<50
C15 - C28 Fraction	----	100	µg/L	<b>1320</b>	<100	<100	----	<100	<100
C29 - C36 Fraction	----	50	µg/L	<b>480</b>	<50	<50	----	<50	<50



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	MW7019	MW7015	QS03	QS07	QS08
Client sampling date / time					10-Oct-2019 00:00	10-Oct-2019 00:00	09-Oct-2019 00:00	09-Oct-2019 00:00	09-Oct-2019 00:00
Compound	CAS Number	LOR	Unit	EM1917008-006	EM1917008-007	EM1917008-008	EM1917008-009	EM1917008-010	
				Result	Result	Result	Result	Result	
<b>EP080/071: Total Petroleum Hydrocarbons - Continued</b>									
^ C10 - C36 Fraction (sum)	----	50	µg/L	2850	<50	<50	----	<50	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20	
>C10 - C16 Fraction	----	100	µg/L	1310	<100	<100	----	<100	
>C16 - C34 Fraction	----	100	µg/L	1320	<100	<100	----	<100	
>C34 - C40 Fraction	----	100	µg/L	230	<100	<100	----	<100	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	2860	<100	<100	----	<100	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	1310	<100	<100	----	<100	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1	
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2	
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2	
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2	
^ Total Xylenes	----	2	µg/L	<2	<2	<2	<2	<2	
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1	
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5	
<b>EP074S: VOC Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	1	%	111	----	----	----	----	
Toluene-D8	2037-26-5	1	%	103	----	----	----	----	
4-Bromofluorobenzene	460-00-4	1	%	119	----	----	----	----	
1,2-Dichloroethane-D4	17060-07-0	5	%	96.1	100	91.9	----	95.6	
Toluene-D8	2037-26-5	5	%	100	105	83.1	----	91.8	
4-Bromofluorobenzene	460-00-4	5	%	104	106	95.4	----	96.8	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	2	%	98.6	110	105	105	109	
Toluene-D8	2037-26-5	2	%	98.2	87.0	77.8	83.6	86.0	
4-Bromofluorobenzene	460-00-4	2	%	110	102	97.3	99.9	101	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID			QS11	----	----	----	----
Client sampling date / time		10-Oct-2019 00:00			----	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1917008-011	-----	-----	-----	-----	-----
				Result	----	----	----	----	----
<b>EA005P: pH by PC Titrator</b>									
pH Value	----	0.01	pH Unit	<b>5.62</b>	----	----	----	----	----
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>									
Total Dissolved Solids @180°C	----	10	mg/L	<10	----	----	----	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<b>6</b>	----	----	----	----	----
<b>EG020T: Total Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----	----
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	<b>0.04</b>	----	----	----	----	----
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>									
Styrene	100-42-5	5	µg/L	<5	----	----	----	----	----
Isopropylbenzene	98-82-8	5	µg/L	<5	----	----	----	----	----
n-Propylbenzene	103-65-1	5	µg/L	<5	----	----	----	----	----
1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	----	----	----	----	----
sec-Butylbenzene	135-98-8	5	µg/L	<5	----	----	----	----	----
1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	----	----	----	----	----
tert-Butylbenzene	98-06-6	5	µg/L	<5	----	----	----	----	----
p-Isopropyltoluene	99-87-6	5	µg/L	<5	----	----	----	----	----
n-Butylbenzene	104-51-8	5	µg/L	<5	----	----	----	----	----
<b>EP074B: Oxygenated Compounds</b>									
Vinyl Acetate	108-05-4	50	µg/L	<50	----	----	----	----	----
2-Butanone (MEK)	78-93-3	50	µg/L	<50	----	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	----	----	----	----	----
2-Hexanone (MBK)	591-78-6	50	µg/L	<50	----	----	----	----	----
<b>EP074C: Sulfonated Compounds</b>									
Carbon disulfide	75-15-0	5	µg/L	<5	----	----	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QS11	----	----	----	----
Client sampling date / time				10-Oct-2019 00:00	----	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1917008-011	-----	-----	-----	-----	-----
				Result	----	----	----	----	----
<b>EP074D: Fumigants</b>									
2,2-Dichloropropane	594-20-7	5	µg/L	<5	----	----	----	----	----
1,2-Dichloropropane	78-87-5	5	µg/L	<5	----	----	----	----	----
cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	----	----	----	----	----
trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	----	----	----	----	----
1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	----	----	----	----	----
<b>EP074E: Halogenated Aliphatic Compounds</b>									
Dichlorodifluoromethane	75-71-8	50	µg/L	<50	----	----	----	----	----
Chloromethane	74-87-3	50	µg/L	<50	----	----	----	----	----
Vinyl chloride	75-01-4	50	µg/L	<50	----	----	----	----	----
Bromomethane	74-83-9	50	µg/L	<50	----	----	----	----	----
Chloroethane	75-00-3	50	µg/L	<50	----	----	----	----	----
Trichlorofluoromethane	75-69-4	50	µg/L	<50	----	----	----	----	----
1,1-Dichloroethene	75-35-4	5	µg/L	<5	----	----	----	----	----
Iodomethane	74-88-4	5	µg/L	<5	----	----	----	----	----
trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	----	----	----	----	----
1,1-Dichloroethane	75-34-3	5	µg/L	<5	----	----	----	----	----
cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	----	----	----	----	----
1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	----	----	----	----	----
1,1-Dichloropropylene	563-58-6	5	µg/L	<5	----	----	----	----	----
Carbon Tetrachloride	56-23-5	5	µg/L	<5	----	----	----	----	----
1,2-Dichloroethane	107-06-2	5	µg/L	<5	----	----	----	----	----
Trichloroethene	79-01-6	5	µg/L	<5	----	----	----	----	----
Dibromomethane	74-95-3	5	µg/L	<5	----	----	----	----	----
1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	----	----	----	----	----
1,3-Dichloropropane	142-28-9	5	µg/L	<5	----	----	----	----	----
Tetrachloroethene	127-18-4	5	µg/L	<5	----	----	----	----	----
1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	----	----	----	----	----
trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	----	----	----	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	----	----	----	----	----
1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	----	----	----	----	----
1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	----	----	----	----	----
Pentachloroethane	76-01-7	5	µg/L	<5	----	----	----	----	----
1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	----	----	----	----	----
Hexachlorobutadiene	87-68-3	5	µg/L	<5	----	----	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QS11	----	----	----	----
Client sampling date / time				10-Oct-2019 00:00	----	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1917008-011	-----	-----	-----	-----	-----
				Result	----	----	----	----	----
<b>EP074F: Halogenated Aromatic Compounds</b>									
Chlorobenzene	108-90-7	5	µg/L	<5	----	----	----	----	----
Bromobenzene	108-86-1	5	µg/L	<5	----	----	----	----	----
2-Chlorotoluene	95-49-8	5	µg/L	<5	----	----	----	----	----
4-Chlorotoluene	106-43-4	5	µg/L	<5	----	----	----	----	----
1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	----	----	----	----	----
1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	----	----	----	----	----
1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	----	----	----	----	----
1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	----	----	----	----	----
1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	----	----	----	----	----
<b>EP074G: Trihalomethanes</b>									
Chloroform	67-66-3	5	µg/L	<5	----	----	----	----	----
Bromodichloromethane	75-27-4	5	µg/L	<5	----	----	----	----	----
Dibromochloromethane	124-48-1	5	µg/L	<5	----	----	----	----	----
Bromoform	75-25-2	5	µg/L	<5	----	----	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----	----
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	----	----	----
<b>EP080: BTEXN</b>									
Benzene	71-43-2	1	µg/L	<1	----	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----	----



### Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QS11	----	----	----	----
Client sampling date / time				10-Oct-2019 00:00	----	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1917008-011	-----	-----	-----	-----	-----
				Result	----	----	----	----	----
<b>EP080: BTEXN - Continued</b>									
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----	----
^ Total Xylenes	----	2	µg/L	<2	----	----	----	----	----
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----	----
<b>EP074S: VOC Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	5	%	91.9	----	----	----	----	----
Toluene-D8	2037-26-5	5	%	88.7	----	----	----	----	----
4-Bromofluorobenzene	460-00-4	5	%	101	----	----	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	2	%	105	----	----	----	----	----
Toluene-D8	2037-26-5	2	%	83.2	----	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	102	----	----	----	----	----



## Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP074S: VOC Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	72	120
Toluene-D8	2037-26-5	70	130
4-Bromofluorobenzene	460-00-4	70	128
1,2-Dichloroethane-D4	17060-07-0	72	132
Toluene-D8	2037-26-5	77	132
4-Bromofluorobenzene	460-00-4	67	131
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129

## QUALITY CONTROL REPORT

<b>Work Order</b>	: <b>EM1917008</b>	<b>Page</b>	: 1 of 16
<b>Amendment</b>	: <b>1</b>		
<b>Client</b>	: <b>SENVERSA PTY LTD</b>	<b>Laboratory</b>	: Environmental Division Melbourne
<b>Contact</b>	: LUCINDA TRICKEY	<b>Contact</b>	: Larissa Burns
<b>Address</b>	: Level 6, 15 William St Melbourne VICTORIA, AUSTRALIA 3000	<b>Address</b>	: 4 Westall Rd Springvale VIC Australia 3171
<b>Telephone</b>	: +61 03 9606 0070	<b>Telephone</b>	: +6138549 9644
<b>Project</b>	: M17571	<b>Date Samples Received</b>	: 11-Oct-2019
<b>Order number</b>	: M17571	<b>Date Analysis Commenced</b>	: 14-Oct-2019
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 24-Oct-2019
<b>Sampler</b>	: SAM O'CONNOR		
<b>Site</b>	: ----		
<b>Quote number</b>	: EN/103/18 (primary work only)		
<b>No. of samples received</b>	: 11		
<b>No. of samples analysed</b>	: 11		



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

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

This Quality Control Report contains the following information:

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

### Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Andrew Lu	VOC Section Supervisor	Melbourne Organics, Springvale, VIC
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC



## General Comments

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

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

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

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

## Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EA005P: pH by PC Titrator (QC Lot: 2637563)</b>									
EM1917008-002	MW7021	EA005-P: pH Value	----	0.01	pH Unit	5.88	5.83	0.854	0% - 20%
EM1916987-008	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.98	7.99	0.125	0% - 20%
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 2643480)</b>									
EM1916987-009	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1500	1510	0.466	0% - 20%
EM1917012-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1970	1800	9.02	0% - 20%
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 2646416)</b>									
EM1916929-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	397	414	4.07	0% - 20%
EM1917008-011	QS11	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	<10	0.00	No Limit
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2637214)</b>									
EM1916974-012	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	12	12	0.00	0% - 50%
EM1916987-009	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	18	19	0.00	0% - 50%
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 2646907)</b>									
EM1915635-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.015	0.015	0.00	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.182	0.187	2.45	0% - 20%
EM1917008-004	MW7016	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.022	0.021	0.00	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG020F: Dissolved Metals by ICP-MS (QC Lot: 2646907) - continued</b>									
EM1917008-004	MW7016	EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.012	0.012	0.00	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.030	0.027	9.22	No Limit
<b>EG020T: Total Metals by ICP-MS (QC Lot: 2643503)</b>									
EM1917014-024	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.002	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
EM1916974-022	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.003	0.002	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.002	0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.024	0.024	0.00	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.011	0.010	0.00	No Limit
<b>EG035F: Dissolved Mercury by FIMS (QC Lot: 2646908)</b>									
EM1916937-011	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1917008-007	MW7015	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2649581)</b>									
EM1917008-010	QS08	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
<b>EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2640392)</b>									
EM1916982-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.06	0.06	0.00	No Limit
EM1916982-010	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.04	0.00	No Limit
<b>EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2640394)</b>									
EM1917008-007	MW7015	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.72	0.72	0.00	0% - 20%
EM1917069-005	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.15	0.16	0.00	0% - 50%
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 2636792)</b>									
EM1916988-001	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.00	No Limit
EM1917008-008	QS03	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.00	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 2636792) - continued</b>										
EM1917008-008	QS03	EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	<5	0.00	No Limit	
		EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	<5	0.00	No Limit	
		EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	<5	0.00	No Limit	
		EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	<5	0.00	No Limit	
		EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	<5	0.00	No Limit	
		EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	<5	0.00	No Limit	
		EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	<5	0.00	No Limit	
		EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	<5	0.00	No Limit	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 2658177)</b>										
EM1917008-006	MW7019	EP074-WF: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit	
		EP074-WF: Toluene	108-88-3	1	µg/L	<1	<1	0.00	No Limit	
		EP074-WF: Ethylbenzene	100-41-4	1	µg/L	<1	<1	0.00	No Limit	
		EP074-WF: meta- & para-Xylene	108-38-3	1	µg/L	<1	<1	0.00	No Limit	
			106-42-3							
		EP074-WF: Styrene	100-42-5	1	µg/L	<1	<1	0.00	No Limit	
		EP074-WF: ortho-Xylene	95-47-6	1	µg/L	<1	<1	0.00	No Limit	
		EP074-WF: Isopropylbenzene	98-82-8	1	µg/L	<1	<1	0.00	No Limit	
		EP074-WF: n-Propylbenzene	103-65-1	1	µg/L	<1	<1	0.00	No Limit	
		EP074-WF: 1.3.5-Trimethylbenzene	108-67-8	1	µg/L	<1	<1	0.00	No Limit	
		EP074-WF: sec-Butylbenzene	135-98-8	1	µg/L	<1	<1	0.00	No Limit	
		EP074-WF: 1.2.4-Trimethylbenzene	95-63-6	1	µg/L	<1	<1	0.00	No Limit	
		EP074-WF: tert-Butylbenzene	98-06-6	1	µg/L	<1	<1	0.00	No Limit	
		EP074-WF: p-Isopropyltoluene	99-87-6	1	µg/L	79	74	6.16	0% - 20%	
		EP074-WF: n-Butylbenzene	104-51-8	1	µg/L	<1	<1	0.00	No Limit	
		EP074-WF: Total Xylenes	----	1	µg/L	<1	<1	0.00	No Limit	
<b>EP074B: Oxygenated Compounds (QC Lot: 2636792)</b>										
EM1916988-001	Anonymous	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.00	No Limit	
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.00	No Limit	
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.00	No Limit	
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.00	No Limit	
EM1917008-008	QS03	EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	<50	0.00	No Limit	
		EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	<50	0.00	No Limit	
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	<50	0.00	No Limit	
		EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	<50	0.00	No Limit	
<b>EP074B: Oxygenated Compounds (QC Lot: 2658177)</b>										
EM1917008-006	MW7019	EP074-WF: Vinyl Acetate	108-05-4	10	µg/L	<10	<10	0.00	No Limit	
		EP074-WF: 2-Butanone (MEK)	78-93-3	10	µg/L	<10	<10	0.00	No Limit	
		EP074-WF: 4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L	<10	<10	0.00	No Limit	
		EP074-WF: 2-Hexanone (MBK)	591-78-6	10	µg/L	<10	<10	0.00	No Limit	



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074C: Sulfonated Compounds (QC Lot: 2636792)</b>									
EM1916988-001	Anonymous	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.00	No Limit
EM1917008-008	QS03	EP074: Carbon disulfide	75-15-0	5	µg/L	<5	<5	0.00	No Limit
<b>EP074C: Sulfonated Compounds (QC Lot: 2658177)</b>									
EM1917008-006	MW7019	EP074-WF: Carbon disulfide	75-15-0	1	µg/L	<1	<1	0.00	No Limit
<b>EP074D: Fumigants (QC Lot: 2636792)</b>									
EM1916988-001	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.00	No Limit
EM1917008-008	QS03	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.00	No Limit
<b>EP074D: Fumigants (QC Lot: 2658177)</b>									
EM1917008-006	MW7019	EP074-WF: 2,2-Dichloropropane	594-20-7	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1,2-Dichloropropane	78-87-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1,2-Dibromoethane (EDB)	106-93-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: cis-1,3-Dichloropropylene	10061-01-5	2	µg/L	<2	<2	0.00	No Limit
		EP074-WF: trans-1,3-Dichloropropylene	10061-02-6	2	µg/L	<2	<2	0.00	No Limit
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 2636792)</b>									
EM1916988-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.00	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 2636792) - continued</b>									
EM1916988-001	Anonymous	EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.00	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.00	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.00	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.00	No Limit
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.00	No Limit		
EM1917008-008	QS03	EP074: 1.1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.00	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.00	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.00	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.00	No Limit

**EP074E: Halogenated Aliphatic Compounds (QC Lot: 2658177)**



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074E: Halogenated Aliphatic Compounds (QC Lot: 2658177) - continued</b>									
EM1917008-006	MW7019	EP074-WF: Vinyl chloride	75-01-4	0.2	µg/L	<0.2	<0.2	0.00	No Limit
		EP074-WF: Hexachlorobutadiene	87-68-3	0.5	µg/L	<0.5	<0.5	0.00	No Limit
		EP074-WF: 1,1-Dichloroethene	75-35-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Iodomethane	74-88-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: trans-1,2-Dichloroethene	156-60-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1,1-Dichloroethane	75-34-3	1	µg/L	1	1	0.00	No Limit
		EP074-WF: cis-1,2-Dichloroethene	156-59-2	1	µg/L	1	1	0.00	No Limit
		EP074-WF: 1,1,1-Trichloroethane	71-55-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1,1-Dichloropropylene	563-58-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Carbon Tetrachloride	56-23-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1,2-Dichloroethane	107-06-2	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Trichloroethene	79-01-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Dibromomethane	74-95-3	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1,1,2-Trichloroethane	79-00-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1,3-Dichloropropane	142-28-9	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Tetrachloroethene	127-18-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1,1,1,2-Tetrachloroethane	630-20-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: trans-1,4-Dichloro-2-butene	110-57-6	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: cis-1,4-Dichloro-2-butene	1476-11-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1,1,2,2-Tetrachloroethane	79-34-5	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1,2,3-Trichloropropane	96-18-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Pentachloroethane	76-01-7	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1,2-Dibromo-3-chloropropane	96-12-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Dichlorodifluoromethane	75-71-8	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Chloromethane	74-87-3	10	µg/L	<10	<10	0.00	No Limit
		EP074-WF: Bromomethane	74-83-9	10	µg/L	<10	<10	0.00	No Limit
EP074-WF: Chloroethane	75-00-3	10	µg/L	<10	<10	0.00	No Limit		
EP074-WF: Trichlorofluoromethane	75-69-4	10	µg/L	<10	<10	0.00	No Limit		
EP074-WF: Methylene chloride	75-09-2	2	µg/L	<2	<2	0.00	No Limit		
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 2636792)</b>									
EM1916988-001	Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.00	No Limit
EM1917008-008	QS03	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.00	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 2636792) - continued</b>									
EM1917008-008	QS03	EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.00	No Limit
<b>EP074F: Halogenated Aromatic Compounds (QC Lot: 2658177)</b>									
EM1917008-006	MW7019	EP074-WF: 1.4-Dichlorobenzene	106-46-7	0.1	µg/L	0.1	0.1	0.00	No Limit
		EP074-WF: Chlorobenzene	108-90-7	1	µg/L	4	4	0.00	No Limit
		EP074-WF: Bromobenzene	108-86-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 2-Chlorotoluene	95-49-8	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 4-Chlorotoluene	106-43-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.3-Dichlorobenzene	541-73-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2-Dichlorobenzene	95-50-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2.4-Trichlorobenzene	120-82-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: 1.2.3-Trichlorobenzene	87-61-6	1	µg/L	<1	<1	0.00	No Limit
<b>EP074G: Trihalomethanes (QC Lot: 2636792)</b>									
EM1916988-001	Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.00	No Limit
EM1917008-008	QS03	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.00	No Limit
		EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.00	No Limit
<b>EP074G: Trihalomethanes (QC Lot: 2658177)</b>									
EM1917008-006	MW7019	EP074-WF: Chloroform	67-66-3	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Bromodichloromethane	75-27-4	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Dibromochloromethane	124-48-1	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Bromoform	75-25-2	1	µg/L	<1	<1	0.00	No Limit
		EP074-WF: Total Trihalomethanes	----	1	µg/L	<1	<1	0.00	No Limit
<b>EP074H: Naphthalene (QC Lot: 2658177)</b>									
EM1917008-006	MW7019	EP074-WF: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2636791)</b>									
EM1916988-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EM1917008-008	QS03	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2636791)</b>									



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2636791) - continued</b>									
EM1916988-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EM1917008-008	QS03	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
<b>EP080: BTEXN (QC Lot: 2636791)</b>									
EM1916988-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1917008-008	QS03	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit



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

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

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 2643480)</b>									
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	101	93.7	107	
				<10	293 mg/L	102	90.0	110	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 2646416)</b>									
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	100	93.7	107	
				<10	293 mg/L	100	90.0	110	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2637214)</b>									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.0	85.8	117	
				<1	100 mg/L	92.2	85.8	117	
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 2646907)</b>									
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	101	88.5	108	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	96.6	83.5	108	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	101	83.2	105	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.4	83.1	106	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.7	84.6	107	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	94.3	84.3	108	
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	101	86.3	111	
<b>EG020T: Total Metals by ICP-MS (QCLot: 2643503)</b>									
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	100	89.2	113	
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	104	86.4	112	
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	96.6	86.9	110	
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	93.9	86.9	109	
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	93.3	88.3	110	
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	99.4	87.9	111	
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	101	86.7	114	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 2646908)</b>									
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	81.3	71.1	112	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 2649581)</b>									
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	89.0	72.6	115	
<b>EK055G: Ammonia as N by Discrete Analyser (QCLot: 2640392)</b>									
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	99.7	88.0	116	
<b>EK055G: Ammonia as N by Discrete Analyser (QCLot: 2640394)</b>									
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	101	88.0	116	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2636792)</b>									



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2636792) - continued</b>									
EP074: Styrene	100-42-5	5	µg/L	<5	20 µg/L	108	80.4	117	
EP074: Isopropylbenzene	98-82-8	5	µg/L	<5	20 µg/L	101	75.0	118	
EP074: n-Propylbenzene	103-65-1	5	µg/L	<5	20 µg/L	103	68.7	114	
EP074: 1.3.5-Trimethylbenzene	108-67-8	5	µg/L	<5	20 µg/L	103	72.1	114	
EP074: sec-Butylbenzene	135-98-8	5	µg/L	<5	20 µg/L	101	69.6	115	
EP074: 1.2.4-Trimethylbenzene	95-63-6	5	µg/L	<5	20 µg/L	105	72.4	113	
EP074: tert-Butylbenzene	98-06-6	5	µg/L	<5	20 µg/L	102	72.6	116	
EP074: p-Isopropyltoluene	99-87-6	5	µg/L	<5	20 µg/L	103	69.2	115	
EP074: n-Butylbenzene	104-51-8	5	µg/L	<5	20 µg/L	100	61.4	115	
<b>EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2658177)</b>									
EP074-WF: Benzene	71-43-2	1	µg/L	<1	20 µg/L	108	78.8	119	
EP074-WF: Toluene	108-88-3	1	µg/L	<1	20 µg/L	95.3	80.6	119	
EP074-WF: Ethylbenzene	100-41-4	1	µg/L	<1	20 µg/L	98.3	79.4	119	
EP074-WF: meta- & para-Xylene	108-38-3	1	µg/L	<1	40 µg/L	98.0	78.1	120	
	106-42-3								
EP074-WF: Styrene	100-42-5	1	µg/L	<1	20 µg/L	101	82.2	117	
EP074-WF: ortho-Xylene	95-47-6	1	µg/L	<1	20 µg/L	99.8	82.9	119	
EP074-WF: Isopropylbenzene	98-82-8	1	µg/L	<1	20 µg/L	96.0	77.6	118	
EP074-WF: n-Propylbenzene	103-65-1	1	µg/L	<1	20 µg/L	96.5	70.9	117	
EP074-WF: 1.3.5-Trimethylbenzene	108-67-8	1	µg/L	<1	20 µg/L	99.5	73.8	116	
EP074-WF: sec-Butylbenzene	135-98-8	1	µg/L	<1	20 µg/L	99.4	71.7	118	
EP074-WF: 1.2.4-Trimethylbenzene	95-63-6	1	µg/L	<1	20 µg/L	99.2	74.7	116	
EP074-WF: tert-Butylbenzene	98-06-6	1	µg/L	<1	20 µg/L	98.7	75.2	118	
EP074-WF: p-Isopropyltoluene	99-87-6	1	µg/L	<1	20 µg/L	97.3	70.7	118	
EP074-WF: n-Butylbenzene	104-51-8	1	µg/L	<1	20 µg/L	94.7	62.7	119	
EP074-WF: Total Xylenes	----	1	µg/L	<1	----	----	----	----	
<b>EP074B: Oxygenated Compounds (QCLot: 2636792)</b>									
EP074: Vinyl Acetate	108-05-4	50	µg/L	<50	200 µg/L	104	71.3	125	
EP074: 2-Butanone (MEK)	78-93-3	50	µg/L	<50	200 µg/L	108	66.4	132	
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	50	µg/L	<50	200 µg/L	111	75.2	132	
EP074: 2-Hexanone (MBK)	591-78-6	50	µg/L	<50	200 µg/L	115	73.9	131	
<b>EP074B: Oxygenated Compounds (QCLot: 2658177)</b>									
EP074-WF: Vinyl Acetate	108-05-4	10	µg/L	<10	200 µg/L	109	75.2	120	
EP074-WF: 2-Butanone (MEK)	78-93-3	10	µg/L	<10	200 µg/L	110	70.2	125	
EP074-WF: 4-Methyl-2-pentanone (MIBK)	108-10-1	10	µg/L	<10	200 µg/L	120	74.7	127	
EP074-WF: 2-Hexanone (MBK)	591-78-6	10	µg/L	<10	200 µg/L	108	74.0	128	
<b>EP074C: Sulfonated Compounds (QCLot: 2636792)</b>									
EP074: Carbon disulfide	75-15-0	5	µg/L	<5	20 µg/L	103	58.2	124	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074C: Sulfonated Compounds (QCLot: 2658177)</b>									
EP074-WF: Carbon disulfide	75-15-0	1	µg/L	<1	20 µg/L	99.8	62.8	123	
<b>EP074D: Fumigants (QCLot: 2636792)</b>									
EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	20 µg/L	101	68.7	120	
EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	20 µg/L	106	79.6	116	
EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	20 µg/L	103	76.2	114	
EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	20 µg/L	104	77.0	114	
EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	20 µg/L	106	80.1	118	
<b>EP074D: Fumigants (QCLot: 2658177)</b>									
EP074-WF: 2,2-Dichloropropane	594-20-7	1	µg/L	<1	20 µg/L	99.7	71.5	121	
EP074-WF: 1,2-Dichloropropane	78-87-5	1	µg/L	<1	20 µg/L	108	80.1	117	
EP074-WF: cis-1,3-Dichloropropylene	10061-01-5	2	µg/L	<2	20 µg/L	104	77.8	114	
EP074-WF: trans-1,3-Dichloropropylene	10061-02-6	2	µg/L	<2	20 µg/L	106	78.7	114	
EP074-WF: 1,2-Dibromoethane (EDB)	106-93-4	1	µg/L	<1	20 µg/L	101	81.4	118	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 2636792)</b>									
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	200 µg/L	109	53.4	140	
EP074: Chloromethane	74-87-3	50	µg/L	<50	200 µg/L	102	63.8	134	
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	200 µg/L	106	57.1	135	
EP074: Bromomethane	74-83-9	50	µg/L	<50	200 µg/L	94.5	51.1	126	
EP074: Chloroethane	75-00-3	50	µg/L	<50	200 µg/L	93.9	64.9	129	
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	200 µg/L	102	65.7	127	
EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	20 µg/L	102	67.4	123	
EP074: Iodomethane	74-88-4	5	µg/L	<5	20 µg/L	94.1	30.9	126	
EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	20 µg/L	103	69.2	119	
EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	20 µg/L	107	76.7	120	
EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	20 µg/L	105	78.9	118	
EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	20 µg/L	101	69.2	120	
EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	20 µg/L	98.8	67.0	120	
EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	20 µg/L	100	63.7	120	
EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	20 µg/L	106	82.0	116	
EP074: Trichloroethene	79-01-6	5	µg/L	<5	20 µg/L	101	72.9	118	
EP074: Dibromomethane	74-95-3	5	µg/L	<5	20 µg/L	107	81.0	116	
EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	20 µg/L	110	84.9	118	
EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	20 µg/L	113	83.4	119	
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	20 µg/L	104	70.4	118	
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	20 µg/L	100	77.9	113	
EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	20 µg/L	109	72.6	122	
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	20 µg/L	96.6	67.8	119	
EP074: 1,1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	20 µg/L	107	83.0	125	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 2636792) - continued</b>									
EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	20 µg/L	112	82.4	123	
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	20 µg/L	99.6	72.7	111	
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	20 µg/L	106	75.4	114	
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	20 µg/L	92.6	62.6	128	
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 2658177)</b>									
EP074-WF: Dichlorodifluoromethane	75-71-8	10	µg/L	<10	200 µg/L	107	55.0	139	
EP074-WF: Chloromethane	74-87-3	10	µg/L	<10	200 µg/L	106	62.0	134	
EP074-WF: Vinyl chloride	75-01-4	0.2	µg/L	<0.2	200 µg/L	108	58.3	137	
EP074-WF: Bromomethane	74-83-9	10	µg/L	<10	200 µg/L	93.6	50.7	127	
EP074-WF: Chloroethane	75-00-3	10	µg/L	<10	200 µg/L	103	66.1	128	
EP074-WF: Trichlorofluoromethane	75-69-4	10	µg/L	<10	200 µg/L	102	67.9	125	
EP074-WF: 1,1-Dichloroethene	75-35-4	1	µg/L	<1	20 µg/L	104	69.2	123	
EP074-WF: Iodomethane	74-88-4	1	µg/L	<1	20 µg/L	85.3	25.6	128	
EP074-WF: Methylene chloride	75-09-2	2	µg/L	<2	20 µg/L	115	83.6	124	
EP074-WF: trans-1,2-Dichloroethene	156-60-5	1	µg/L	<1	20 µg/L	103	71.8	118	
EP074-WF: 1,1-Dichloroethane	75-34-3	1	µg/L	<1	20 µg/L	106	77.9	119	
EP074-WF: cis-1,2-Dichloroethene	156-59-2	1	µg/L	<1	20 µg/L	108	80.3	117	
EP074-WF: 1,1,1-Trichloroethane	71-55-6	1	µg/L	<1	20 µg/L	103	72.4	119	
EP074-WF: 1,1-Dichloropropylene	563-58-6	1	µg/L	<1	20 µg/L	104	69.9	119	
EP074-WF: Carbon Tetrachloride	56-23-5	1	µg/L	<1	20 µg/L	96.0	67.3	118	
EP074-WF: 1,2-Dichloroethane	107-06-2	1	µg/L	<1	20 µg/L	108	82.4	115	
EP074-WF: Trichloroethene	79-01-6	1	µg/L	<1	20 µg/L	104	73.7	118	
EP074-WF: Dibromomethane	74-95-3	1	µg/L	<1	20 µg/L	105	80.7	115	
EP074-WF: 1,1,2-Trichloroethane	79-00-5	1	µg/L	<1	20 µg/L	106	86.0	118	
EP074-WF: 1,3-Dichloropropane	142-28-9	1	µg/L	<1	20 µg/L	102	85.0	119	
EP074-WF: Tetrachloroethene	127-18-4	1	µg/L	<1	20 µg/L	96.3	72.9	120	
EP074-WF: 1,1,1,2-Tetrachloroethane	630-20-6	1	µg/L	<1	20 µg/L	91.0	81.3	114	
EP074-WF: trans-1,4-Dichloro-2-butene	110-57-6	1	µg/L	<1	20 µg/L	96.8	76.0	120	
EP074-WF: cis-1,4-Dichloro-2-butene	1476-11-5	1	µg/L	<1	20 µg/L	86.7	71.5	115	
EP074-WF: 1,1,2,2-Tetrachloroethane	79-34-5	1	µg/L	<1	20 µg/L	108	84.0	122	
EP074-WF: 1,2,3-Trichloropropane	96-18-4	1	µg/L	<1	20 µg/L	103	83.6	120	
EP074-WF: Pentachloroethane	76-01-7	1	µg/L	<1	20 µg/L	88.3	74.6	113	
EP074-WF: 1,2-Dibromo-3-chloropropane	96-12-8	1	µg/L	<1	20 µg/L	94.4	75.3	115	
EP074-WF: Hexachlorobutadiene	87-68-3	0.5	µg/L	<0.5	20 µg/L	95.7	61.9	132	
EP074-WF: Bromochloromethane	74-97-5	1	µg/L	<1	20 µg/L	107	83.3	114	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 2636792)</b>									
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	20 µg/L	105	81.7	116	
EP074: Bromobenzene	108-86-1	5	µg/L	<5	20 µg/L	108	75.2	118	
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	20 µg/L	106	75.0	114	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 2636792) - continued</b>									
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	20 µg/L	104	72.8	113	
EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	20 µg/L	104	74.7	116	
EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	20 µg/L	104	75.5	119	
EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	20 µg/L	105	82.0	113	
EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	20 µg/L	104	64.0	123	
EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	20 µg/L	100	75.5	119	
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 2658177)</b>									
EP074-WF: Chlorobenzene	108-90-7	1	µg/L	<1	20 µg/L	102	83.8	116	
EP074-WF: Bromobenzene	108-86-1	1	µg/L	<1	20 µg/L	102	73.9	121	
EP074-WF: 2-Chlorotoluene	95-49-8	1	µg/L	<1	20 µg/L	100	76.5	116	
EP074-WF: 4-Chlorotoluene	106-43-4	1	µg/L	<1	20 µg/L	101	74.0	116	
EP074-WF: 1,3-Dichlorobenzene	541-73-1	1	µg/L	<1	20 µg/L	102	75.9	117	
EP074-WF: 1,4-Dichlorobenzene	106-46-7	0.1	µg/L	<0.1	20 µg/L	105	76.5	119	
EP074-WF: 1,2-Dichlorobenzene	95-50-1	1	µg/L	<1	20 µg/L	104	83.0	114	
EP074-WF: 1,2,4-Trichlorobenzene	120-82-1	1	µg/L	<1	20 µg/L	99.4	66.2	125	
EP074-WF: 1,2,3-Trichlorobenzene	87-61-6	1	µg/L	<1	20 µg/L	102	76.8	121	
<b>EP074G: Trihalomethanes (QCLot: 2636792)</b>									
EP074: Chloroform	67-66-3	5	µg/L	<5	20 µg/L	104	80.4	118	
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	20 µg/L	101	78.6	115	
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	20 µg/L	103	77.7	113	
EP074: Bromoform	75-25-2	5	µg/L	<5	20 µg/L	100	74.2	113	
<b>EP074G: Trihalomethanes (QCLot: 2658177)</b>									
EP074-WF: Chloroform	67-66-3	1	µg/L	<1	20 µg/L	107	81.3	117	
EP074-WF: Bromodichloromethane	75-27-4	1	µg/L	<1	20 µg/L	104	79.6	114	
EP074-WF: Dibromochloromethane	124-48-1	1	µg/L	<1	20 µg/L	89.1	79.9	113	
EP074-WF: Bromoform	75-25-2	1	µg/L	<1	20 µg/L	85.9	76.4	112	
EP074-WF: Total Trihalomethanes	----	1	µg/L	<1	----	----	----	----	
<b>EP074H: Naphthalene (QCLot: 2658177)</b>									
EP074-WF: Naphthalene	91-20-3	5	µg/L	<5	20 µg/L	103	81.8	117	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2636791)</b>									
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	91.7	65.5	129	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2636967)</b>									
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3330 µg/L	104	44.8	125	
EP071: C15 - C28 Fraction	----	100	µg/L	<100	16500 µg/L	97.7	51.3	135	
EP071: C29 - C36 Fraction	----	50	µg/L	<50	7800 µg/L	93.8	49.4	134	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2636791)</b>									
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	91.0	64.3	126	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2636967)</b>									



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2636967) - continued</b>									
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	5690 µg/L	93.3	47.3	129	
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	20700 µg/L	96.6	50.4	133	
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1510 µg/L	96.9	45.2	136	
<b>EP080: BTEXN (QCLot: 2636791)</b>									
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	92.3	69.8	124	
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	90.9	73.6	126	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	97.4	72.0	126	
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	98.9	71.5	132	
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	100	76.5	132	
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	101	70.5	127	

### Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%)		Recovery Limits (%)	
					MS	Low	High	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2637214)</b>								
EM1916974-015	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	85.6	70.0	130	
<b>EG020F: Dissolved Metals by ICP-MS (QCLot: 2646907)</b>								
EM1915635-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	102	85.0	131	
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	99.5	81.0	133	
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	102	71.0	135	
		EG020A-F: Copper	7440-50-8	0.2 mg/L	98.4	76.0	130	
		EG020A-F: Lead	7439-92-1	0.2 mg/L	99.2	75.0	133	
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	95.8	73.0	131	
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	100	75.0	131	
<b>EG020T: Total Metals by ICP-MS (QCLot: 2643503)</b>								
EM1916974-022	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	109	82.0	118	
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	107	75.0	129	
		EG020A-T: Chromium	7440-47-3	1 mg/L	105	80.0	118	
		EG020A-T: Copper	7440-50-8	1 mg/L	103	81.0	115	
		EG020A-T: Lead	7439-92-1	1 mg/L	107	83.0	121	
		EG020A-T: Nickel	7440-02-0	1 mg/L	107	80.0	118	
		EG020A-T: Zinc	7440-66-6	1 mg/L	109	74.0	116	
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 2646908)</b>								



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EG035F: Dissolved Mercury by FIMS (QCLot: 2646908) - continued</b>							
EM1916937-037	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	87.3	70.0	120
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 2649581)</b>							
EM1917008-011	QS11	EG035T: Mercury	7439-97-6	0.01 mg/L	90.4	70.0	130
<b>EK055G: Ammonia as N by Discrete Analyser (QCLot: 2640392)</b>							
EM1916982-002	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	120	70.0	130
<b>EK055G: Ammonia as N by Discrete Analyser (QCLot: 2640394)</b>							
EM1917008-008	QS03	EK055G: Ammonia as N	7664-41-7	1 mg/L	121	70.0	130
<b>EP074E: Halogenated Aliphatic Compounds (QCLot: 2636792)</b>							
EM1916990-001	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	20 µg/L	109	40.0	124
		EP074: Trichloroethene	79-01-6	20 µg/L	104	54.0	126
<b>EP074F: Halogenated Aromatic Compounds (QCLot: 2636792)</b>							
EM1916990-001	Anonymous	EP074: Chlorobenzene	108-90-7	20 µg/L	118	68.0	132
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2636791)</b>							
EM1916990-001	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	96.3	43.0	125
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2636791)</b>							
EM1916990-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	91.3	44.0	122
<b>EP080: BTEXN (QCLot: 2636791)</b>							
EM1916990-001	Anonymous	EP080: Benzene	71-43-2	20 µg/L	115	68.0	130
		EP080: Toluene	108-88-3	20 µg/L	110	72.0	132

## QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EM1917008	Page	: 1 of 12
Amendment	: 1		
Client	: SENVERSA PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: LUCINDA TRICKEY	Telephone	: +6138549 9644
Project	: M17571	Date Samples Received	: 11-Oct-2019
Site	: ----	Issue Date	: 24-Oct-2019
Sampler	: SAM O'CONNOR	No. of samples received	: 11
Order number	: M17571	No. of samples analysed	: 11

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

#### Outliers : Analysis Holding Time Compliance

- Analysis Holding Time Outliers exist - please see following pages for full details.

#### Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.



### Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method	Extraction / Preparation			Analysis			
	Container / Client Sample ID(s)	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
<b>EA005P: pH by PC Titrator</b>							
<b>Clear Plastic Bottle - Natural</b> MW7020, MW7018, QS03	MW7021, MW7016,	----	----	----	15-Oct-2019	09-Oct-2019	6
<b>Clear Plastic Bottle - Natural</b> MW7075, QS11	MW7015,	----	----	----	15-Oct-2019	10-Oct-2019	5

### Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
<b>Laboratory Duplicates (DUP)</b>					
TRH - Semivolatile Fraction	0	14	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
<b>Matrix Spikes (MS)</b>					
TRH - Semivolatile Fraction	0	14	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds WF Detection Limits	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

### Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

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

Method	Sample Date	Extraction / Preparation			Analysis			
		Container / Client Sample ID(s)	Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EA005P: pH by PC Titrator</b>								
<b>Clear Plastic Bottle - Natural (EA005-P)</b> MW7020, MW7018, QS03	09-Oct-2019	MW7021, MW7016,	----	----	----	15-Oct-2019	09-Oct-2019	*
<b>Clear Plastic Bottle - Natural (EA005-P)</b> MW7075, QS11	10-Oct-2019	MW7015,	----	----	----	15-Oct-2019	10-Oct-2019	*



Matrix: **WATER**

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

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>								
<b>Clear Plastic Bottle - Natural (EA015H)</b> MW7020, MW7018, QS03	MW7021, MW7016,	09-Oct-2019	----	----	----	16-Oct-2019	16-Oct-2019	✓
<b>Clear Plastic Bottle - Natural (EA015H)</b> MW7075, QS11	MW7015,	10-Oct-2019	----	----	----	17-Oct-2019	17-Oct-2019	✓
<b>ED041G: Sulfate (Turbidimetric) as SO<sub>4</sub> 2- by DA</b>								
<b>Clear Plastic Bottle - Natural (ED041G)</b> MW7020, MW7018, QS03	MW7021, MW7016,	09-Oct-2019	----	----	----	16-Oct-2019	06-Nov-2019	✓
<b>Clear Plastic Bottle - Natural (ED041G)</b> MW7075, QS11	MW7015,	10-Oct-2019	----	----	----	16-Oct-2019	07-Nov-2019	✓
<b>EG020F: Dissolved Metals by ICP-MS</b>								
<b>Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)</b> MW7020, MW7018, QS03	MW7021, MW7016,	09-Oct-2019	----	----	----	17-Oct-2019	06-Apr-2020	✓
<b>Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)</b> MW7075,	MW7015	10-Oct-2019	----	----	----	17-Oct-2019	07-Apr-2020	✓
<b>Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-F)</b> MW7019		10-Oct-2019	----	----	----	17-Oct-2019	07-Apr-2020	✓
<b>EG020T: Total Metals by ICP-MS</b>								
<b>Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)</b> QS08		09-Oct-2019	16-Oct-2019	06-Apr-2020	✓	16-Oct-2019	06-Apr-2020	✓
<b>Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)</b> QS11		10-Oct-2019	16-Oct-2019	07-Apr-2020	✓	16-Oct-2019	07-Apr-2020	✓
<b>EG035F: Dissolved Mercury by FIMS</b>								
<b>Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)</b> MW7020, MW7018, QS03	MW7021, MW7016,	09-Oct-2019	----	----	----	18-Oct-2019	06-Nov-2019	✓
<b>Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)</b> MW7075,	MW7015	10-Oct-2019	----	----	----	18-Oct-2019	07-Nov-2019	✓
<b>Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035F)</b> MW7019		10-Oct-2019	----	----	----	18-Oct-2019	24-Oct-2019	✓



Matrix: **WATER**

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

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) QS08	09-Oct-2019	----	----	----	18-Oct-2019	06-Nov-2019	✓	
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) QS11	10-Oct-2019	----	----	----	18-Oct-2019	07-Nov-2019	✓	
<b>EK055G: Ammonia as N by Discrete Analyser</b>								
Clear Plastic Bottle - Sulfuric Acid (EK055G) MW7020, MW7018, QS03	MW7021, MW7016,	09-Oct-2019	----	----	----	16-Oct-2019	06-Nov-2019	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) MW7075, MW7015,	MW7019, QS11	10-Oct-2019	----	----	----	16-Oct-2019	07-Nov-2019	✓
<b>EP074A: Monocyclic Aromatic Hydrocarbons</b>								
Amber TOC Vial - Sulfuric Acid (EP074) MW7075		10-Oct-2019	14-Oct-2019	24-Oct-2019	✓	14-Oct-2019	24-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074) MW7020, MW7018, QS03,	MW7021, MW7016, QS08	09-Oct-2019	14-Oct-2019	23-Oct-2019	✓	14-Oct-2019	23-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074) MW7019, QS11	MW7015,	10-Oct-2019	14-Oct-2019	24-Oct-2019	✓	14-Oct-2019	24-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074-WF) MW7019		10-Oct-2019	23-Oct-2019	24-Oct-2019	✓	23-Oct-2019	24-Oct-2019	✓
<b>EP074B: Oxygenated Compounds</b>								
Amber TOC Vial - Sulfuric Acid (EP074) MW7075		10-Oct-2019	14-Oct-2019	24-Oct-2019	✓	14-Oct-2019	24-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074) MW7020, MW7018, QS03,	MW7021, MW7016, QS08	09-Oct-2019	14-Oct-2019	23-Oct-2019	✓	14-Oct-2019	23-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074) MW7019, QS11	MW7015,	10-Oct-2019	14-Oct-2019	24-Oct-2019	✓	14-Oct-2019	24-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074-WF) MW7019		10-Oct-2019	23-Oct-2019	24-Oct-2019	✓	23-Oct-2019	24-Oct-2019	✓



Matrix: WATER

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

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP074C: Sulfonated Compounds</b>							
Amber TOC Vial - Sulfuric Acid (EP074) MW7075	10-Oct-2019	14-Oct-2019	24-Oct-2019	✓	14-Oct-2019	24-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074) MW7020, MW7018, QS03, MW7021, MW7016, QS08	09-Oct-2019	14-Oct-2019	23-Oct-2019	✓	14-Oct-2019	23-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074) MW7019, QS11, MW7015,	10-Oct-2019	14-Oct-2019	24-Oct-2019	✓	14-Oct-2019	24-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074-WF) MW7019	10-Oct-2019	23-Oct-2019	24-Oct-2019	✓	23-Oct-2019	24-Oct-2019	✓
<b>EP074D: Fumigants</b>							
Amber TOC Vial - Sulfuric Acid (EP074) MW7075	10-Oct-2019	14-Oct-2019	24-Oct-2019	✓	14-Oct-2019	24-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074) MW7020, MW7018, QS03, MW7021, MW7016, QS08	09-Oct-2019	14-Oct-2019	23-Oct-2019	✓	14-Oct-2019	23-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074) MW7019, QS11, MW7015,	10-Oct-2019	14-Oct-2019	24-Oct-2019	✓	14-Oct-2019	24-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074-WF) MW7019	10-Oct-2019	23-Oct-2019	24-Oct-2019	✓	23-Oct-2019	24-Oct-2019	✓
<b>EP074E: Halogenated Aliphatic Compounds</b>							
Amber TOC Vial - Sulfuric Acid (EP074) MW7075	10-Oct-2019	14-Oct-2019	24-Oct-2019	✓	14-Oct-2019	24-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074) MW7020, MW7018, QS03, MW7021, MW7016, QS08	09-Oct-2019	14-Oct-2019	23-Oct-2019	✓	14-Oct-2019	23-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074) MW7019, QS11, MW7015,	10-Oct-2019	14-Oct-2019	24-Oct-2019	✓	14-Oct-2019	24-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074-WF) MW7019	10-Oct-2019	23-Oct-2019	24-Oct-2019	✓	23-Oct-2019	24-Oct-2019	✓



Matrix: **WATER**

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

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP074F: Halogenated Aromatic Compounds</b>							
Amber TOC Vial - Sulfuric Acid (EP074) MW7075	10-Oct-2019	14-Oct-2019	24-Oct-2019	✓	14-Oct-2019	24-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074) MW7020, MW7018, QS03, MW7021, MW7016, QS08	09-Oct-2019	14-Oct-2019	23-Oct-2019	✓	14-Oct-2019	23-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074) MW7019, QS11 MW7015,	10-Oct-2019	14-Oct-2019	24-Oct-2019	✓	14-Oct-2019	24-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074-WF) MW7019	10-Oct-2019	23-Oct-2019	24-Oct-2019	✓	23-Oct-2019	24-Oct-2019	✓
<b>EP074G: Trihalomethanes</b>							
Amber TOC Vial - Sulfuric Acid (EP074) MW7075	10-Oct-2019	14-Oct-2019	24-Oct-2019	✓	14-Oct-2019	24-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074) MW7020, MW7018, QS03, MW7021, MW7016, QS08	09-Oct-2019	14-Oct-2019	23-Oct-2019	✓	14-Oct-2019	23-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074) MW7019, QS11 MW7015,	10-Oct-2019	14-Oct-2019	24-Oct-2019	✓	14-Oct-2019	24-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP074-WF) MW7019	10-Oct-2019	23-Oct-2019	24-Oct-2019	✓	23-Oct-2019	24-Oct-2019	✓
<b>EP074H: Naphthalene</b>							
Amber VOC Vial - Sulfuric Acid (EP074-WF) MW7019	10-Oct-2019	23-Oct-2019	24-Oct-2019	✓	23-Oct-2019	24-Oct-2019	✓



Matrix: **WATER**

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

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080/071: Total Petroleum Hydrocarbons</b>								
<b>Amber Glass Bottle - Unpreserved (EP071)</b> MW7020, MW7018, QS03,	MW7021, MW7016, QS08	09-Oct-2019	14-Oct-2019	16-Oct-2019	✓	15-Oct-2019	23-Nov-2019	✓
<b>Amber Glass Bottle - Unpreserved (EP071)</b> MW7075, MW7015,	MW7019, QS11	10-Oct-2019	14-Oct-2019	17-Oct-2019	✓	15-Oct-2019	23-Nov-2019	✓
<b>Amber TOC Vial - Sulfuric Acid (EP080)</b> MW7075		10-Oct-2019	14-Oct-2019	24-Oct-2019	✓	14-Oct-2019	24-Oct-2019	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MW7020, MW7018, QS03, QS08	MW7021, MW7016, QS07,	09-Oct-2019	14-Oct-2019	23-Oct-2019	✓	14-Oct-2019	23-Oct-2019	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MW7019, QS11	MW7015,	10-Oct-2019	14-Oct-2019	24-Oct-2019	✓	14-Oct-2019	24-Oct-2019	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>								
<b>Amber Glass Bottle - Unpreserved (EP071)</b> MW7020, MW7018, QS03,	MW7021, MW7016, QS08	09-Oct-2019	14-Oct-2019	16-Oct-2019	✓	15-Oct-2019	23-Nov-2019	✓
<b>Amber Glass Bottle - Unpreserved (EP071)</b> MW7075, MW7015,	MW7019, QS11	10-Oct-2019	14-Oct-2019	17-Oct-2019	✓	15-Oct-2019	23-Nov-2019	✓
<b>Amber TOC Vial - Sulfuric Acid (EP080)</b> MW7075		10-Oct-2019	14-Oct-2019	24-Oct-2019	✓	14-Oct-2019	24-Oct-2019	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MW7020, MW7018, QS03, QS08	MW7021, MW7016, QS07,	09-Oct-2019	14-Oct-2019	23-Oct-2019	✓	14-Oct-2019	23-Oct-2019	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MW7019, QS11	MW7015,	10-Oct-2019	14-Oct-2019	24-Oct-2019	✓	14-Oct-2019	24-Oct-2019	✓



Matrix: **WATER**

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

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EP080: BTEXN</b>								
<b>Amber TOC Vial - Sulfuric Acid (EP080)</b> MW7075	10-Oct-2019	14-Oct-2019	24-Oct-2019	✓	14-Oct-2019	24-Oct-2019	✓	
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MW7020, MW7018, QS03, QS08	MW7021, MW7016, QS07,	09-Oct-2019	14-Oct-2019	23-Oct-2019	✓	14-Oct-2019	23-Oct-2019	✓
<b>Amber VOC Vial - Sulfuric Acid (EP080)</b> MW7019, QS11	MW7015,	10-Oct-2019	14-Oct-2019	24-Oct-2019	✓	14-Oct-2019	24-Oct-2019	✓



## Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Laboratory Duplicates (DUP)</b>							
Ammonia as N by Discrete analyser	EK055G	4	31	12.90	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	10.53	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	4	40	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	2	50.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	8	25.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	14	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	14	14.29	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	2	14	14.29	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds WF Detection Limits	EP074-WF	1	1	100.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
<b>Laboratory Control Samples (LCS)</b>							
Ammonia as N by Discrete analyser	EK055G	2	31	6.45	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	10.53	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	4	40	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	14	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	14	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	14	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds WF Detection Limits	EP074-WF	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
<b>Method Blanks (MB)</b>							
Ammonia as N by Discrete analyser	EK055G	2	31	6.45	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	40	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	14	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	14	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	14	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds WF Detection Limits	EP074-WF	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard



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

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<b>Matrix Spikes (MS)</b>							
Ammonia as N by Discrete analyser	EK055G	2	31	6.45	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	14	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	14	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	14	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds WF Detection Limits	EP074-WF	0	1	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard



## Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM (2013) Schedule B(3)
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of 'filterable' residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (2013) Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
Volatile Organic Compounds	EP074	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)



<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Volatile Organic Compounds WF Detection Limits	EP074-WF	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

Chain of Custody Documentation

Laboratory: ALS VIC  
Address: 2-4 Westall Road, Springvale  
Contact: Larissa Burns / Sample Log In  
Phone: 03 8549 9600

Environmental Division  
Melbourne  
Work Order Reference  
**EM1917008**



Telephone : + 61-3-8549 9600

Job Number:	M17571	Purchase Order:	M17571
Project Name:	Due Diligence Lease Investigation	Quote No:	
Sampled By:	S.O'Connor	Turn Around Time:	Standard
Project Manager:	Lucinda Trickey	Page:	1 of 1
Email Report To:	lucinda.trickey@senversa.com.au	Phone/Mobile:	+61 424 172 065

Sample Information					Container Information		Analysis Required											
Lab ID	Sample ID	Matrix *	Date	Time	Type / Code	Total Bottles	TRH, VOCs (W-9 suite)	Sulphate, ammonia, TDS, pH	Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg) (W-2 suite)	TRH C6-C8 and BTEXN (W-18 Suite)	Sulphate, ammonia, pH							
1	MW7020	Water	9/10/2019				X	X	X									
2	MW7021	Water	9/10/2019				X	X	X									
3	MW7018	Water	9/10/2019				X	X	X									
4	MW7016	Water	9/10/2019				X	X	X									
5	MW7075	Water	10/10/2019				X	X	X									
6	MW7019	Water	10/10/2019				X		X		X							
7	MW7015	Water	10/10/2019				X	X	X									Please filter metals in the lab
8	QS03	Water	9/10/2019				X	X	X									
-	QS04	Water	9/10/2019				X	X	X									Please forward to eurofins
9	QS07	Water	9/10/2019							X								
10	QS08	Water	9/10/2019				X		X									
11	QS11	Water	10/10/2019				X	X	X									
<b>Total:</b>							11	9	11	1	1							

Forwarded to  
Secondary Lab  
Initials AS Date 11/10

Sampler: I attest that proper field sampling procedures in accordance with Senversa standard procedures and/or project specifications were used during the collection of these samples: **Sampler Name:** Sam O'Connor **Signature:** **Date:** 11/10/2019

<b>Relinquished By:</b> Name/Signature: Sam O'Connor Of: Senversa	Date: 11/10/19 Time: 12:05	<b>Method of Shipment (if applicable):</b> Carrier / Reference #: ROP 93-JET	<b>Received by:</b> Name/Signature: KARMEL Of: ACS	Date: 11/10/19 Time: 13:30
Name/Signature:	Date:	Carrier / Reference #:	Name/Signature:	Date:
Of:	Time:	Date/Time:	Of:	Time:
Name/Signature:	Date:	Carrier / Reference #:	Name/Signature:	Date:
Of:	Time:	Date/Time:	Of:	Time:

**Water Container Codes:** P = Unpreserved Plastic; N = Nitric Acid (HNO<sub>3</sub>) Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide (NaOH)/Cadmium (Cd) Preserved; S = Sodium Hydroxide Preserved Plastic; STH = Sodium thiosulfate preserved plastic; V = VOA Vial Hydrochloric Acid (HCl) Preserved; VS = VOA Vial Sulphuric Preserved; VSA = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulphuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; UA = Unpreserved Amber Glass; L=Lugol's Iodine preserved white plastic bottle; SW= sulfuric acid preserved wide mouth glass jar

Completed by: \_\_\_\_\_  
Checked by: \_\_\_\_\_

## CERTIFICATE OF ANALYSIS

**Work Order** : **EM1917208**  
**Client** : **SENVERSA PTY LTD**  
**Contact** : LUCINDA TRICKEY  
**Address** : Level 6, 15 William St  
 Melbourne VICTORIA, AUSTRALIA 3000  
**Telephone** : +61 03 9606 0070  
**Project** : M17571  
**Order number** : ----  
**C-O-C number** : ----  
**Sampler** : MH  
**Site** : ----  
**Quote number** : EN/333 (secondary work only)  
**No. of samples received** : 2  
**No. of samples analysed** : 1

**Page** : 1 of 6  
**Laboratory** : Environmental Division Melbourne  
**Contact** : Larissa Burns  
**Address** : 4 Westall Rd Springvale VIC Australia 3171  
**Telephone** : +6138549 9644  
**Date Samples Received** : 15-Oct-2019 08:45  
**Date Analysis Commenced** : 16-Oct-2019  
**Issue Date** : 21-Oct-2019 16:45



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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

### Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC



## General Comments

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

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

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

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

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

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

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

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Client sample ID			QC06	----	----	----	----
Client sampling date / time		09-Oct-2019 00:00			----	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1917208-002	-----	-----	-----	-----	-----
				Result	----	----	----	----	----
<b>EA001: pH in soil using 0.01M CaCl extract</b>									
pH (CaCl2)	----	0.1	pH Unit	8.2	----	----	----	----	----
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>									
Moisture Content	----	1.0	%	9.6	----	----	----	----	----
<b>ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)</b>									
Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	----	----	----	----	----
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
Arsenic	7440-38-2	5	mg/kg	<5	----	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----	----
Chromium	7440-47-3	2	mg/kg	2	----	----	----	----	----
Copper	7440-50-8	5	mg/kg	<5	----	----	----	----	----
Lead	7439-92-1	5	mg/kg	<5	----	----	----	----	----
Nickel	7440-02-0	2	mg/kg	10	----	----	----	----	----
Zinc	7440-66-6	5	mg/kg	7	----	----	----	----	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>									
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	----	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC06	----	----	----	----
Client sampling date / time				09-Oct-2019 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	EM1917208-002	-----	-----	-----	-----	
				Result	----	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	----	----	----	----	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	----	----	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----	
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----	
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----	
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----	
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	----	----	
>C16 - C34 Fraction	----	100	mg/kg	<100	----	----	----	----	
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	----	----	----	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----	
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	----	----	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	----	----	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	----	----	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	----	----	
^ Total Xylenes	----	0.5	mg/kg	<0.5	----	----	----	----	
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----	
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%	88.1	----	----	----	----	
2-Chlorophenol-D4	93951-73-6	0.5	%	87.4	----	----	----	----	
2,4,6-Tribromophenol	118-79-6	0.5	%	76.7	----	----	----	----	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%	68.4	----	----	----	----	
Anthracene-d10	1719-06-8	0.5	%	84.0	----	----	----	----	



### Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC06	---	---	---	---
Client sampling date / time				09-Oct-2019 00:00	---	---	---	---	---
Compound	CAS Number	LOR	Unit	EM1917208-002	-----	-----	-----	-----	-----
				Result	---	---	---	---	---
<b>EP075(SIM)T: PAH Surrogates - Continued</b>									
4-Terphenyl-d14	1718-51-0	0.5	%	96.1	---	---	---	---	---
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	72.2	---	---	---	---	---
Toluene-D8	2037-26-5	0.2	%	72.3	---	---	---	---	---
4-Bromofluorobenzene	460-00-4	0.2	%	108	---	---	---	---	---



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2,4,6-Tribromophenol	118-79-6	34	122
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: EM1917208</b>	<b>Page</b>	: 1 of 7
<b>Client</b>	<b>: SENVERSA PTY LTD</b>	<b>Laboratory</b>	: Environmental Division Melbourne
<b>Contact</b>	: LUCINDA TRICKEY	<b>Contact</b>	: Larissa Burns
<b>Address</b>	: Level 6, 15 William St Melbourne VICTORIA, AUSTRALIA 3000	<b>Address</b>	: 4 Westall Rd Springvale VIC Australia 3171
<b>Telephone</b>	: +61 03 9606 0070	<b>Telephone</b>	: +6138549 9644
<b>Project</b>	: M17571	<b>Date Samples Received</b>	: 15-Oct-2019
<b>Order number</b>	: ----	<b>Date Analysis Commenced</b>	: 16-Oct-2019
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 21-Oct-2019
<b>Sampler</b>	: MH		
<b>Site</b>	: ----		
<b>Quote number</b>	: EN/333 (secondary work only)		
<b>No. of samples received</b>	: 2		
<b>No. of samples analysed</b>	: 1		



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

This Quality Control Report contains the following information:

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

### *Signatories*

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC



## General Comments

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

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

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

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

## Laboratory Duplicate (DUP) Report

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

Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG005(ED093): Total Metals by ICP-AES (QC Lot: 2650036)</b>									
EM1917105-036	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	37	42	11.7	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	26	31	17.1	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	16	18	13.3	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	34	28	19.3	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	35	36	4.28	No Limit
EM1917203-078	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	68	74	7.54	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	43	47	8.04	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	52	38	32.3	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	7	7	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	56	63	12.7	0% - 50%
<b>EA001: pH in soil using 0.01M CaCl extract (QC Lot: 2643823)</b>									
EM1917129-008	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	7.2	7.3	1.65	0% - 20%
ES1933453-001	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	7.3	7.3	0.00	0% - 20%
<b>EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2646596)</b>									
EM1917196-002	Anonymous	EA055: Moisture Content	----	0.1	%	10.5	10.9	3.18	0% - 50%
EM1917216-003	Anonymous	EA055: Moisture Content	----	0.1	%	23.8	23.8	0.00	0% - 20%
<b>ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QC Lot: 2651922)</b>									
EM1917208-002	QC06	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	<50	0.00	No Limit
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2650035)</b>									
EM1917105-036	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2650035) - continued</b>									
EM1917203-078	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2649998)</b>									
EM1917208-002	QC06	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2643786)</b>									
EM1917102-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EM1917102-011	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2649997)</b>									
EM1917203-057	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1917208-002	QC06	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2643786)</b>									
EM1917102-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EM1917102-011	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2649997)</b>									
EM1917203-057	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2649997) - continued</b>									
EM1917208-002	QC06	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
<b>EP080: BTEXN (QC Lot: 2643786)</b>									
EM1917102-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EM1917102-011	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit



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

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

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2650036)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	96.6	78.5	107	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	88.1	76.2	108	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	94.2	77.7	110	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	91.9	78.1	108	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	90.4	78.4	106	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	97.3	79.9	109	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	90.8	79.1	110	
<b>ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 2651922)</b>									
ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	3000 mg/kg	101	86.1	116	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 2650035)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	100	76.9	110	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2649998)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	113	84.6	128	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	104	76.9	127	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	106	85.3	128	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	107	82.1	126	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	98.2	85.4	133	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	104	88.7	136	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	# 81.7	83.4	136	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	87.7	85.1	140	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	82.2	80.7	130	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	86.2	85.2	141	
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	3 mg/kg	93.9	68.5	120	
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	103	80.1	132	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	116	67.4	120	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	83.2	66.0	126	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	90.6	65.4	127	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	88.9	67.8	127	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2643786)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	75.3	61.2	127	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2649997)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	688 mg/kg	102	71.8	129	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3100 mg/kg	96.4	83.9	125	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	High
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2649997) - continued</b>									
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1490 mg/kg	93.0	77.9	119	
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2643786)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	71.6	59.5	125	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2649997)</b>									
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1050 mg/kg	96.4	72.2	128	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3960 mg/kg	97.6	82.1	122	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	280 mg/kg	81.5	55.1	131	
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----	
<b>EP080: BTEXN (QCLot: 2643786)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	68.1	62.7	119	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	79.4	66.6	126	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	76.9	66.3	124	
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	88.0	67.5	128	
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	92.8	73.0	128	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	91.4	61.2	123	

### Matrix Spike (MS) Report

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

Sub-Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%)	
				Low	High	High	
<b>EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2650036)</b>							
EM1917105-038	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	90.3	78.0	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	89.8	84.0	116
		EG005T: Chromium	7440-47-3	50 mg/kg	89.5	79.0	121
		EG005T: Copper	7440-50-8	50 mg/kg	93.2	82.0	124
		EG005T: Lead	7439-92-1	50 mg/kg	90.8	76.0	124
		EG005T: Nickel	7440-02-0	50 mg/kg	90.4	78.0	120
		EG005T: Zinc	7440-66-6	50 mg/kg	86.5	74.0	128
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 2650035)</b>							
EM1917105-038	Anonymous	EG035T: Mercury	7439-97-6	0.5 mg/kg	105	76.0	116
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2649998)</b>							
EM1917235-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	94.8	67.0	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	70.3	52.0	148



Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2643786)</b>							
EM1917102-002	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	80.7	42.0	131
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2649997)</b>							
EM1917191-001	Anonymous	EP071: C10 - C14 Fraction	----	688 mg/kg	114	53.0	123
		EP071: C15 - C28 Fraction	----	3100 mg/kg	# Not Determined	70.0	124
		EP071: C29 - C36 Fraction	----	1490 mg/kg	# Not Determined	64.0	118
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2643786)</b>							
EM1917102-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	75.1	39.0	129
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2649997)</b>							
EM1917191-001	Anonymous	EP071: >C10 - C16 Fraction	----	1050 mg/kg	116	65.0	123
		EP071: >C16 - C34 Fraction	----	3960 mg/kg	# Not Determined	67.0	121
		EP071: >C34 - C40 Fraction	----	280 mg/kg	# Not Determined	44.0	126
<b>EP080: BTEXN (QCLot: 2643786)</b>							
EM1917102-002	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	84.0	50.0	136
		EP080: Toluene	108-88-3	2 mg/kg	94.6	56.0	139



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EM1917208	Page	: 1 of 6
Client	: SENVERSA PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: LUCINDA TRICKEY	Telephone	: +6138549 9644
Project	: M17571	Date Samples Received	: 15-Oct-2019
Site	: ----	Issue Date	: 21-Oct-2019
Sampler	: MH	No. of samples received	: 2
Order number	: ----	No. of samples analysed	: 1

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- Laboratory Control outliers exist - please see following pages for full details.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

#### Outliers : Analysis Holding Time Compliance

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

#### Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.



### Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Laboratory Control Spike (LCS) Recoveries</b>							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	QC-2649998-001	----	Fluoranthene	206-44-0	81.7 %	83.4-136%	Recovery less than lower control limit
<b>Matrix Spike (MS) Recoveries</b>							
EP080/071: Total Petroleum Hydrocarbons	EM1917191--001	Anonymous	C15 - C28 Fraction	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP080/071: Total Petroleum Hydrocarbons	EM1917191--001	Anonymous	C29 - C36 Fraction	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM1917191--001	Anonymous	>C16 - C34 Fraction	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM1917191--001	Anonymous	>C34 - C40 Fraction	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

### Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
<b>Matrix Spikes (MS)</b>					
Sulfate - Calcium Phosphate Soluble	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

### Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EA001: pH in soil using 0.01M CaCl extract</b>							
Soil Glass Jar - Unpreserved (EA001) QC06	09-Oct-2019	16-Oct-2019	16-Oct-2019	✓	16-Oct-2019	16-Oct-2019	✓
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>							
Soil Glass Jar - Unpreserved (EA055) QC06	09-Oct-2019	----	----	----	17-Oct-2019	23-Oct-2019	✓



Matrix: **SOIL**

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

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)</b>							
Soil Glass Jar - Unpreserved (ED040N) QC06	09-Oct-2019	19-Oct-2019	06-Apr-2020	✓	21-Oct-2019	06-Apr-2020	✓
<b>EG005(ED093)T: Total Metals by ICP-AES</b>							
Soil Glass Jar - Unpreserved (EG005T) QC06	09-Oct-2019	18-Oct-2019	06-Apr-2020	✓	18-Oct-2019	06-Apr-2020	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
Soil Glass Jar - Unpreserved (EG035T) QC06	09-Oct-2019	18-Oct-2019	06-Nov-2019	✓	19-Oct-2019	06-Nov-2019	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP075(SIM)) QC06	09-Oct-2019	18-Oct-2019	23-Oct-2019	✓	20-Oct-2019	27-Nov-2019	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP080) QC06	09-Oct-2019	16-Oct-2019	23-Oct-2019	✓	18-Oct-2019	23-Oct-2019	✓
Soil Glass Jar - Unpreserved (EP071) QC06	09-Oct-2019	18-Oct-2019	23-Oct-2019	✓	20-Oct-2019	27-Nov-2019	✓
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>							
Soil Glass Jar - Unpreserved (EP080) QC06	09-Oct-2019	16-Oct-2019	23-Oct-2019	✓	18-Oct-2019	23-Oct-2019	✓
Soil Glass Jar - Unpreserved (EP071) QC06	09-Oct-2019	18-Oct-2019	23-Oct-2019	✓	20-Oct-2019	27-Nov-2019	✓
<b>EP080: BTEXN</b>							
Soil Glass Jar - Unpreserved (EP080) QC06	09-Oct-2019	16-Oct-2019	23-Oct-2019	✓	18-Oct-2019	23-Oct-2019	✓



## Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	3	33.33	10.00	✔	NEPM 2013 B3 & ALS QC Standard
pH in soil using a 0.01M CaCl2 extract	EA001	2	10	20.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate - Calcium Phosphate Soluble	ED040N	1	1	100.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	12	16.67	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	16	12.50	10.00	✔	NEPM 2013 B3 & ALS QC Standard
<b>Laboratory Control Samples (LCS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	3	33.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate - Calcium Phosphate Soluble	ED040N	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
<b>Method Blanks (MB)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	3	33.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate - Calcium Phosphate Soluble	ED040N	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	3	33.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sulfate - Calcium Phosphate Soluble	ED040N	0	1	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard



## Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl <sub>2</sub> extract	EA001	SOIL	In house: Referenced to Rayment and Lyons (2011) 4B3 (mod.) or 4B4 (mod.) 10 g of soil is mixed with 50 mL of 0.01M CaCl <sub>2</sub> and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM (2013) Schedule B(3)
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Sulfate - Calcium Phosphate Soluble	ED040N	SOIL	In house: The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulfate while calcium ions depress the extraction of interfering S from soil organic matter. SO <sub>4</sub> in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 406)
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> ) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C <sub>10</sub> - C <sub>40</sub> . Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.

Preparation Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl <sub>2</sub> extract	EA001-PR	SOIL	In house: Referenced to Rayment and Higginson 4B1, 10 g of soil is mixed with 50 mL of 0.01M CaCl <sub>2</sub> and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Calcium Phosphate Extraction for Sulphate as SO <sub>4</sub> <sup>2-</sup>	ED040NPR	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulphate while calcium ions depress the extraction of interfering S from soil organic matter. SO <sub>4</sub> in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 406)



<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : EM1917208

Client	: SENVERSA PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: LUCINDA TRICKEY	Contact	: Larissa Burns
Address	: Level 6, 15 William St Melbourne VICTORIA, AUSTRALIA 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: lucinda.trickey@senversa.com.au	E-mail	: Larissa.burns@alsglobal.com
Telephone	: +61 03 9606 0070	Telephone	: +6138549 9644
Facsimile	: +61 03 9606 0074	Facsimile	: +61-3-8549 9626
Project	: M17571	Page	: 1 of 2
Order number	: ----	Quote number	: EM2017SENV0009 (EN/333 (secondary work only))
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: MH		

Dates

Date Samples Received	: 15-Oct-2019 08:45	Issue Date	: 16-Oct-2019
Client Requested Due Date	: 22-Oct-2019	Scheduled Reporting Date	: <b>22-Oct-2019</b>

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 5.8°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 2 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA001 pH (CaCl)	SOIL - EA055-103 Moisture Content	SOIL - ED040N Calcium Phosphate Extractable Sulfate	SOIL - S-26 β metals/TRH/BTEXN/PAH
EM1917208-001	09-Oct-2019 00:00	QC02	✓				
EM1917208-002	09-Oct-2019 00:00	QC06		✓	✓	✓	✓

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

## Requested Deliverables

### LUCINDA TRICKEY

- |  |       |                                 |
|--|-------|---------------------------------|
| - *AU Certificate of Analysis - NATA (COA)                     | Email | lucinda.trickey@senversa.com.au |
| - *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)    | Email | lucinda.trickey@senversa.com.au |
| - *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)            | Email | lucinda.trickey@senversa.com.au |
| - A4 - AU Sample Receipt Notification - Environmental HT (SRN) | Email | lucinda.trickey@senversa.com.au |
| - A4 - AU Tax Invoice (INV)                                    | Email | lucinda.trickey@senversa.com.au |
| - Chain of Custody (CoC) (COC)                                 | Email | lucinda.trickey@senversa.com.au |
| - EDI Format - ENMRG (ENMRG)                                   | Email | lucinda.trickey@senversa.com.au |
| - EDI Format - ESDAT (ESDAT)                                   | Email | lucinda.trickey@senversa.com.au |

### SUPPLIER ACCOUNTS

- |                             |       |                                  |
|-----------------------------|-------|----------------------------------|
| - A4 - AU Tax Invoice (INV) | Email | supplieraccounts@senversa.com.au |
|-----------------------------|-------|----------------------------------|



**Melbourne**

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

**Sydney**

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

**Brisbane**

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

**Perth**

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

## Sample Receipt Advice

Company name: **Senversa Pty Ltd VIC**  
Contact name: Lucinda Trickey  
Project name: ESA  
Project ID: 17571  
COC number: Not provided  
Turn around time: 5 Day  
Date/Time received: Nov 19, 2019 4:55 PM  
Eurofins reference: **688915**

### Sample information

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 6.2 degrees Celsius.
- 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:

Harry Bacalis on Phone : or by e.mail: HarryBacalis@eurofins.com

Results will be delivered electronically via e.mail to Lucinda Trickey - Lucinda.Trickey@senversa.com.au.

<b>Company Name:</b> Senversa Pty Ltd VIC	<b>Order No.:</b>	<b>Received:</b> Nov 19, 2019 4:55 PM
<b>Address:</b> Level 6, 15 William St Melbourne VIC 3000	<b>Report #:</b> 688915	<b>Due:</b> Nov 26, 2019
	<b>Phone:</b> 9606 0070	<b>Priority:</b> 5 Day
	<b>Fax:</b>	<b>Contact Name:</b> Lucinda Trickey
<b>Project Name:</b> ESA		
<b>Project ID:</b> 17571		

**Eurofins Analytical Services Manager : Harry Bacalis**

Sample Detail						HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	TRH C6-C9	BTEX	Moisture Set	Eurofins   mgt Suite B7
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>						X	X	X	X	X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>												
<b>Brisbane Laboratory - NATA Site # 20794</b>												
<b>Perth Laboratory - NATA Site # 23736</b>												
<b>External Laboratory</b>												
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	SB7381_0.4-0.5	Nov 19, 2019		Soil	M19-No26582		X	X			X	X
2	SB7381_1.9-2.0	Nov 19, 2019		Soil	M19-No26583		X	X			X	X
3	SB7382_0.8-0.9	Nov 19, 2019		Soil	M19-No26584		X	X			X	X
4	SB7383_0.1-0.2	Nov 19, 2019		Soil	M19-No26585		X	X			X	X
5	SB7383_0.9-1.0	Nov 19, 2019		Soil	M19-No26586		X	X			X	X
6	SB7384_0.1-	Nov 19, 2019		Soil	M19-No26587		X	X			X	X

<b>Company Name:</b> Senversa Pty Ltd VIC	<b>Order No.:</b>	<b>Received:</b> Nov 19, 2019 4:55 PM
<b>Address:</b> Level 6, 15 William St Melbourne VIC 3000	<b>Report #:</b> 688915	<b>Due:</b> Nov 26, 2019
	<b>Phone:</b> 9606 0070	<b>Priority:</b> 5 Day
	<b>Fax:</b>	<b>Contact Name:</b> Lucinda Trickey
<b>Project Name:</b> ESA		
<b>Project ID:</b> 17571		

**Eurofins Analytical Services Manager : Harry Bacalis**

Sample Detail				HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	TRH C6-C9	BTEX	Moisture Set	Eurofins   mgt Suite B7
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>				X	X	X	X	X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>										
<b>Brisbane Laboratory - NATA Site # 20794</b>										
<b>Perth Laboratory - NATA Site # 23736</b>										
	0.2									
7	SB7384_0.4-0.5	Nov 19, 2019	Soil		X	X			X	X
8	QS01	Nov 19, 2019	Water				X	X		
9	QS04	Nov 19, 2019	Water							X
10	SB7381_0.1-0.2	Nov 19, 2019	Soil	X						
11	SB7381_0.9-1.0	Nov 19, 2019	Soil	X						
12	SB7382_0.4-0.5	Nov 19, 2019	Soil	X						
13	SB7382_1.9-2.0	Nov 19, 2019	Soil	X						
14	SB7383_0.4-	Nov 19, 2019	Soil	X						



# Environment Testing

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

**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

<b>Company Name:</b>	Senversa Pty Ltd VIC	<b>Order No.:</b>		<b>Received:</b>	Nov 19, 2019 4:55 PM
<b>Address:</b>	Level 6, 15 William St Melbourne VIC 3000	<b>Report #:</b>	688915	<b>Due:</b>	Nov 26, 2019
<b>Project Name:</b>	ESA	<b>Phone:</b>	9606 0070	<b>Priority:</b>	5 Day
<b>Project ID:</b>	17571	<b>Fax:</b>		<b>Contact Name:</b>	Lucinda Trickey

**Eurofins Analytical Services Manager : Harry Bacalis**

Sample Detail						HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	TRH C6-C9	BTEX	Moisture Set	Eurofins   mgt Suite B7
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>						X	X	X	X	X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>												
<b>Brisbane Laboratory - NATA Site # 20794</b>												
<b>Perth Laboratory - NATA Site # 23736</b>												
	0.5											
15	SB7383_1.9-2.0	Nov 19, 2019		Soil	M19-No26596	X						
16	SB7384_0.9-1.0	Nov 19, 2019		Soil	M19-No26597	X						
17	SB7384_1.9-2.0	Nov 19, 2019		Soil	M19-No26598	X						
18	SB7382_0.1-0.2	Nov 19, 2019		Soil	M19-No26599		X	X			X	X
19	QS02	Nov 19, 2019		Soil	M19-No26600		X	X			X	X
<b>Test Counts</b>						8	9	9	1	1	9	10

Senversa Pty Ltd VIC  
Level 6, 15 William St  
Melbourne  
VIC 3000



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: **Lucinda Trickey**

Report **688915-S**

Project name **ESA**

Project ID **17571**

Received Date **Nov 19, 2019**

Client Sample ID			SB7381_0.4-0.5	SB7381_1.9-2.0	SB7382_0.8-0.9	SB7383_0.1-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-No26582	M19-No26583	M19-No26584	M19-No26585
Date Sampled			Nov 19, 2019	Nov 19, 2019	Nov 19, 2019	Nov 19, 2019
Test/Reference	LOR	Unit				
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>						
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
<b>BTEX</b>						
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	89	86	88
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
Naphthalene <sup>N02</sup>	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) <sup>N04</sup>	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	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
<b>Polycyclic Aromatic Hydrocarbons</b>						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SB7381_0.4-0.5	SB7381_1.9-2.0	SB7382_0.8-0.9	SB7383_0.1-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-No26582	M19-No26583	M19-No26584	M19-No26585
Date Sampled			Nov 19, 2019	Nov 19, 2019	Nov 19, 2019	Nov 19, 2019
Test/Reference	LOR	Unit				
<b>Polycyclic Aromatic Hydrocarbons</b>						
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	68	71	74	81
p-Terphenyl-d14 (surr.)	1	%	97	116	146	112
<b>Heavy Metals</b>						
Arsenic	2	mg/kg	16	6.1	< 2	8.0
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	31	8.0	< 5	23
Copper	5	mg/kg	170	< 5	< 5	44
Lead	5	mg/kg	80	< 5	< 5	40
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	17	< 5	< 5	57
Zinc	5	mg/kg	630	5.1	< 5	210
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	7.9	8.7	8.0	8.7
Sulphate (as SO4)	30	mg/kg	750	600	< 30	< 30
% Moisture	1	%	6.7	19	5.7	12

Client Sample ID			SB7383_0.9-1.0	SB7384_0.1-0.2	SB7384_0.4-0.5	SB7382_0.1-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-No26586	M19-No26587	M19-No26588	M19-No26599
Date Sampled			Nov 19, 2019	Nov 19, 2019	Nov 19, 2019	Nov 19, 2019
Test/Reference	LOR	Unit				
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>						
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	620	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	640	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	1260	< 50	< 50
<b>BTEX</b>						
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	%	86	110	72	74

Client Sample ID			SB7383_0.9-1.0	SB7384_0.1-0.2	SB7384_0.4-0.5	SB7382_0.1-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-No26586	M19-No26587	M19-No26588	M19-No26599
Date Sampled			Nov 19, 2019	Nov 19, 2019	Nov 19, 2019	Nov 19, 2019
Test/Reference	LOR	Unit				
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>						
Naphthalene <sup>N02</sup>	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) <sup>N04</sup>	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	1100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	310	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	1410	< 100	< 100
<b>Polycyclic Aromatic Hydrocarbons</b>						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	18	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	18	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	18	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	5.9	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	15	< 0.5	< 0.5
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	< 0.5	6.3	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	4.2	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	6.9	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	11	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	1.0	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	15	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	3.4	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	0.8	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	18	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	87.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	97	50	86	59
p-Terphenyl-d14 (surr.)	1	%	79	80	116	76
<b>pH (1:5 Aqueous extract at 25°C as rec.)</b>						
	0.1	pH Units	8.7	8.5	9.3	8.5
<b>Sulphate (as SO4)</b>						
	30	mg/kg	41	< 30	< 30	< 30
<b>% Moisture</b>						
	1	%	9.7	22	21	9.4
<b>Heavy Metals</b>						
Arsenic	2	mg/kg	4.5	9.6	24	4.8
Cadmium	0.4	mg/kg	< 0.4	0.7	< 0.4	< 0.4
Chromium	5	mg/kg	10.0	26	54	14
Copper	5	mg/kg	< 5	86	21	34
Lead	5	mg/kg	< 5	46	12	320
Mercury	0.1	mg/kg	< 0.1	0.1	< 0.1	< 0.1
Nickel	5	mg/kg	7.4	39	32	22
Zinc	5	mg/kg	8.9	200	50	98

<b>Client Sample ID</b>			<b>QS02</b>
<b>Sample Matrix</b>			<b>Soil</b>
<b>Eurofins Sample No.</b>			<b>M19-No26600</b>
<b>Date Sampled</b>			<b>Nov 19, 2019</b>
Test/Reference	LOR	Unit	
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50
<b>BTEX</b>			
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	%	59
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>			
Naphthalene <sup>N02</sup>	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100
<b>Polycyclic Aromatic Hydrocarbons</b>			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	69
p-Terphenyl-d14 (surr.)	1	%	55
<b>pH (1:5 Aqueous extract at 25°C as rec.)</b>			
	0.1	pH Units	8.7
<b>Sulphate (as SO4)</b>			
	30	mg/kg	< 30
<b>% Moisture</b>			
	1	%	21

<b>Client Sample ID</b>			<b>QS02</b>
<b>Sample Matrix</b>			<b>Soil</b>
<b>Eurofins Sample No.</b>			<b>M19-No26600</b>
<b>Date Sampled</b>			<b>Nov 19, 2019</b>
Test/Reference	LOR	Unit	
<b>Heavy Metals</b>			
Arsenic	2	mg/kg	20
Cadmium	0.4	mg/kg	0.5
Chromium	5	mg/kg	39
Copper	5	mg/kg	70
Lead	5	mg/kg	55
Mercury	0.1	mg/kg	0.1
Nickel	5	mg/kg	33
Zinc	5	mg/kg	300

**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 B7			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Nov 21, 2019	14 Days
BTEX - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Nov 21, 2019	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Nov 21, 2019	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Nov 21, 2019	
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Nov 21, 2019	14 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Nov 21, 2019	180 Days
pH (1:5 Aqueous extract at 25°C as rec.) - Method: LTM-GEN-7090 pH in soil by ISE	Melbourne	Nov 21, 2019	7 Days
Sulphate (as SO <sub>4</sub> ) - Method: LTM-INO-4110 Sulfate by Discrete Analyser	Melbourne	Nov 21, 2019	28 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Melbourne	Nov 19, 2019	14 Days

<b>Company Name:</b> Senversa Pty Ltd VIC	<b>Order No.:</b>	<b>Received:</b> Nov 19, 2019 4:55 PM
<b>Address:</b> Level 6, 15 William St Melbourne VIC 3000	<b>Report #:</b> 688915	<b>Due:</b> Nov 26, 2019
<b>Project Name:</b> ESA	<b>Phone:</b> 9606 0070	<b>Priority:</b> 5 Day
<b>Project ID:</b> 17571	<b>Fax:</b>	<b>Contact Name:</b> Lucinda Trickey

**Eurofins Analytical Services Manager : Harry Bacalis**

Sample Detail						HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	TRH C6-C9	BTEX	Moisture Set	Eurofins   mgt Suite B7
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>						X	X	X	X	X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>												
<b>Brisbane Laboratory - NATA Site # 20794</b>												
<b>Perth Laboratory - NATA Site # 23736</b>												
<b>External Laboratory</b>												
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	SB7381_0.4-0.5	Nov 19, 2019		Soil	M19-No26582		X	X			X	X
2	SB7381_1.9-2.0	Nov 19, 2019		Soil	M19-No26583		X	X			X	X
3	SB7382_0.8-0.9	Nov 19, 2019		Soil	M19-No26584		X	X			X	X
4	SB7383_0.1-0.2	Nov 19, 2019		Soil	M19-No26585		X	X			X	X
5	SB7383_0.9-1.0	Nov 19, 2019		Soil	M19-No26586		X	X			X	X
6	SB7384_0.1-	Nov 19, 2019		Soil	M19-No26587		X	X			X	X

<b>Company Name:</b> Senversa Pty Ltd VIC	<b>Order No.:</b>	<b>Received:</b> Nov 19, 2019 4:55 PM
<b>Address:</b> Level 6, 15 William St Melbourne VIC 3000	<b>Report #:</b> 688915	<b>Due:</b> Nov 26, 2019
<b>Project Name:</b> ESA	<b>Phone:</b> 9606 0070	<b>Priority:</b> 5 Day
<b>Project ID:</b> 17571	<b>Fax:</b>	<b>Contact Name:</b> Lucinda Trickey

**Eurofins Analytical Services Manager : Harry Bacalis**

Sample Detail			HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	TRH C6-C9	BTEX	Moisture Set	Eurofins   mgt Suite B7
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>			X	X	X	X	X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>									
<b>Brisbane Laboratory - NATA Site # 20794</b>									
<b>Perth Laboratory - NATA Site # 23736</b>									
	0.2								
7	SB7384_0.4-0.5	Nov 19, 2019			X	X		X	X
8	QS01	Nov 19, 2019				X	X		
9	QS04	Nov 19, 2019							X
10	SB7381_0.1-0.2	Nov 19, 2019							
11	SB7381_0.9-1.0	Nov 19, 2019							
12	SB7382_0.4-0.5	Nov 19, 2019							
13	SB7382_1.9-2.0	Nov 19, 2019							
14	SB7383_0.4-	Nov 19, 2019							

<b>Company Name:</b> Senversa Pty Ltd VIC	<b>Order No.:</b>	<b>Received:</b> Nov 19, 2019 4:55 PM
<b>Address:</b> Level 6, 15 William St Melbourne VIC 3000	<b>Report #:</b> 688915	<b>Due:</b> Nov 26, 2019
<b>Project Name:</b> ESA	<b>Phone:</b> 9606 0070	<b>Priority:</b> 5 Day
<b>Project ID:</b> 17571	<b>Fax:</b>	<b>Contact Name:</b> Lucinda Trickey

**Eurofins Analytical Services Manager : Harry Bacalis**

Sample Detail						HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	TRH C6-C9	BTEX	Moisture Set	Eurofins   mgt Suite B7
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>						X	X	X	X	X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>												
<b>Brisbane Laboratory - NATA Site # 20794</b>												
<b>Perth Laboratory - NATA Site # 23736</b>												
	0.5											
15	SB7383_1.9-2.0	Nov 19, 2019		Soil	M19-No26596	X						
16	SB7384_0.9-1.0	Nov 19, 2019		Soil	M19-No26597	X						
17	SB7384_1.9-2.0	Nov 19, 2019		Soil	M19-No26598	X						
18	SB7382_0.1-0.2	Nov 19, 2019		Soil	M19-No26599		X	X			X	X
19	QS02	Nov 19, 2019		Soil	M19-No26600		X	X			X	X
<b>Test Counts</b>						8	9	9	1	1	9	10

**Internal Quality Control Review and Glossary**
**General**

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

**Holding Times**

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

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

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

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

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

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

**Units**

**mg/kg:** milligrams per kilogram

**mg/L:** milligrams per litre

**ug/L:** micrograms per litre

**ppm:** Parts per million

**ppb:** Parts per billion

**%:** Percentage

**org/100mL:** Organisms per 100 millilitres

**NTU:** Nephelometric Turbidity Units

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

**Terms**

<b>Dry</b>	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
<b>LOR</b>	Limit of Reporting.
<b>SPIKE</b>	Addition of the analyte to the sample and reported as percentage recovery.
<b>RPD</b>	Relative Percent Difference between two Duplicate pieces of analysis.
<b>LCS</b>	Laboratory Control Sample - reported as percent recovery.
<b>CRM</b>	Certified Reference Material - reported as percent recovery.
<b>Method Blank</b>	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.
<b>Surr - Surrogate</b>	The addition of a like compound to the analyte target and reported as percentage recovery.
<b>Duplicate</b>	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
<b>USEPA</b>	United States Environmental Protection Agency
<b>APHA</b>	American Public Health Association
<b>TCLP</b>	Toxicity Characteristic Leaching Procedure
<b>COC</b>	Chain of Custody
<b>SRA</b>	Sample Receipt Advice
<b>QSM</b>	US Department of Defense Quality Systems Manual Version 5.3
<b>CP</b>	Client Parent - QC was performed on samples pertaining to this report
<b>NCP</b>	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.
<b>TEQ</b>	Toxic Equivalency Quotient

**QC - Acceptance Criteria**

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

Results <10 times the LOR : No Limit

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

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

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

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

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

**QC Data General Comments**

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

**Quality Control Results**

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Method Blank</b>							
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>							
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	
<b>Method Blank</b>							
<b>BTEX</b>							
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	
<b>Method Blank</b>							
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>							
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	
<b>Method Blank</b>							
<b>Polycyclic Aromatic Hydrocarbons</b>							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
<b>Method Blank</b>							
Sulphate (as SO4)	mg/kg	< 30			30	Pass	
<b>Method Blank</b>							
<b>Heavy Metals</b>							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
<b>LCS - % Recovery</b>							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>								
TRH C6-C9	%	105			70-130	Pass		
TRH C10-C14	%	127			70-130	Pass		
<b>LCS - % Recovery</b>								
<b>BTEX</b>								
Benzene	%	120			70-130	Pass		
Toluene	%	124			70-130	Pass		
Ethylbenzene	%	118			70-130	Pass		
m&p-Xylenes	%	119			70-130	Pass		
Xylenes - Total	%	116			70-130	Pass		
<b>LCS - % Recovery</b>								
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>								
Naphthalene	%	110			70-130	Pass		
TRH C6-C10	%	102			70-130	Pass		
TRH >C10-C16	%	122			70-130	Pass		
<b>LCS - % Recovery</b>								
<b>Polycyclic Aromatic Hydrocarbons</b>								
Acenaphthene	%	96			70-130	Pass		
Acenaphthylene	%	88			70-130	Pass		
Anthracene	%	100			70-130	Pass		
Benz(a)anthracene	%	80			70-130	Pass		
Benzo(a)pyrene	%	77			70-130	Pass		
Benzo(b&j)fluoranthene	%	82			70-130	Pass		
Benzo(g,h,i)perylene	%	84			70-130	Pass		
Benzo(k)fluoranthene	%	92			70-130	Pass		
Chrysene	%	103			70-130	Pass		
Dibenz(a,h)anthracene	%	72			70-130	Pass		
Fluoranthene	%	117			70-130	Pass		
Fluorene	%	102			70-130	Pass		
Indeno(1,2,3-cd)pyrene	%	77			70-130	Pass		
Naphthalene	%	94			70-130	Pass		
Phenanthrene	%	99			70-130	Pass		
Pyrene	%	115			70-130	Pass		
<b>LCS - % Recovery</b>								
Sulphate (as SO4)	%	96			70-130	Pass		
<b>LCS - % Recovery</b>								
<b>Heavy Metals</b>								
Arsenic	%	90			80-120	Pass		
Cadmium	%	100			80-120	Pass		
Chromium	%	91			80-120	Pass		
Copper	%	90			80-120	Pass		
Lead	%	88			80-120	Pass		
Mercury	%	94			75-125	Pass		
Nickel	%	89			80-120	Pass		
Zinc	%	91			80-120	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
<b>Spike - % Recovery</b>								
<b>Polycyclic Aromatic Hydrocarbons</b>				Result 1				
Acenaphthene	M19-No26545	NCP	%	94		70-130	Pass	
Acenaphthylene	M19-No26545	NCP	%	85		70-130	Pass	
Anthracene	M19-No26545	NCP	%	102		70-130	Pass	
Benz(a)anthracene	M19-No26545	NCP	%	73		70-130	Pass	
Benzo(a)pyrene	M19-No26545	NCP	%	84		70-130	Pass	
Benzo(b&j)fluoranthene	M19-No26545	NCP	%	77		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(g,h,i)perylene	M19-No26545	NCP	%	73			70-130	Pass	
Benzo(k)fluoranthene	M19-No26545	NCP	%	107			70-130	Pass	
Chrysene	M19-No26545	NCP	%	88			70-130	Pass	
Dibenz(a,h)anthracene	M19-No26545	NCP	%	70			70-130	Pass	
Fluoranthene	M19-No26545	NCP	%	90			70-130	Pass	
Fluorene	M19-No26545	NCP	%	100			70-130	Pass	
Indeno(1,2,3-cd)pyrene	M19-No26545	NCP	%	79			70-130	Pass	
Naphthalene	M19-No26545	NCP	%	93			70-130	Pass	
Phenanthrene	M19-No26545	NCP	%	91			70-130	Pass	
Pyrene	M19-No26545	NCP	%	89			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Heavy Metals</b>				Result 1					
Arsenic	M19-No27522	NCP	%	107			75-125	Pass	
Cadmium	M19-No27522	NCP	%	95			75-125	Pass	
Copper	M19-No27522	NCP	%	109			75-125	Pass	
Lead	M19-No27522	NCP	%	108			75-125	Pass	
Mercury	M19-No27522	NCP	%	75			70-130	Pass	
Nickel	M19-No27522	NCP	%	107			75-125	Pass	
Zinc	M19-No27522	NCP	%	113			75-125	Pass	
<b>Spike - % Recovery</b>									
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1					
TRH C6-C9	M19-No26583	CP	%	126			70-130	Pass	
TRH C10-C14	M19-No26583	CP	%	93			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>BTEX</b>				Result 1					
Benzene	M19-No26583	CP	%	114			70-130	Pass	
Toluene	M19-No26583	CP	%	120			70-130	Pass	
Ethylbenzene	M19-No26583	CP	%	112			70-130	Pass	
m&p-Xylenes	M19-No26583	CP	%	118			70-130	Pass	
o-Xylene	M19-No26583	CP	%	123			70-130	Pass	
Xylenes - Total	M19-No26583	CP	%	120			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1					
Naphthalene	M19-No26583	CP	%	105			70-130	Pass	
TRH C6-C10	M19-No26583	CP	%	123			70-130	Pass	
TRH >C10-C16	M19-No26583	CP	%	89			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Duplicate</b>									
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1	Result 2	RPD			
TRH C6-C9	M19-No29917	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M19-No26582	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M19-No26582	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M19-No26582	CP	mg/kg	< 50	< 50	<1	30%	Pass	
<b>Duplicate</b>									
<b>BTEX</b>				Result 1	Result 2	RPD			
Benzene	M19-No29917	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M19-No29917	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M19-No29917	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M19-No29917	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M19-No29917	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M19-No29917	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

<b>Duplicate</b>								
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1	Result 2	RPD		
Naphthalene	M19-No29917	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	M19-No29917	NCP	mg/kg	< 20	< 20	<1	30%	Pass
TRH >C10-C16	M19-No26582	CP	mg/kg	< 50	< 50	<1	30%	Pass
TRH >C16-C34	M19-No26582	CP	mg/kg	< 100	< 100	<1	30%	Pass
TRH >C34-C40	M19-No26582	CP	mg/kg	< 100	< 100	<1	30%	Pass
<b>Duplicate</b>								
<b>Polycyclic Aromatic Hydrocarbons</b>				Result 1	Result 2	RPD		
Acenaphthene	M19-No26544	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	M19-No26544	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	M19-No26544	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benz(a)anthracene	M19-No26544	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)pyrene	M19-No26544	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	M19-No26544	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	M19-No26544	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	M19-No26544	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	M19-No26544	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	M19-No26544	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	M19-No26544	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	M19-No26544	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	M19-No26544	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	M19-No26544	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	M19-No26544	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	M19-No26544	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
<b>Duplicate</b>								
				Result 1	Result 2	RPD		
Sulphate (as SO <sub>4</sub> )	M19-No26406	NCP	mg/kg	11000	8700	21	30%	Pass
% Moisture	M19-No26561	NCP	%	19	19	<1	30%	Pass
<b>Duplicate</b>								
<b>Heavy Metals</b>				Result 1	Result 2	RPD		
Arsenic	M19-No27522	NCP	mg/kg	4.1	4.2	2.0	30%	Pass
Cadmium	M19-No27521	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	M19-No27522	NCP	mg/kg	130	130	4.0	30%	Pass
Copper	M19-No27522	NCP	mg/kg	12	13	2.0	30%	Pass
Lead	M19-No27522	NCP	mg/kg	24	24	<1	30%	Pass
Mercury	M19-No27522	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	M19-No27522	NCP	mg/kg	9.8	9.8	<1	30%	Pass
Zinc	M19-No27522	NCP	mg/kg	6.2	6.2	<1	30%	Pass
<b>Duplicate</b>								
				Result 1	Result 2	RPD		
pH (1:5 Aqueous extract at 25°C as rec.)	M19-No26599	CP	pH Units	8.5	8.5	pass	30%	Pass
<b>Duplicate</b>								
				Result 1	Result 2	RPD		
pH (1:5 Aqueous extract at 25°C as rec.)	M19-No26600	CP	pH Units	8.7	8.6	pass	30%	Pass

**Comments**
**Sample Integrity**

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

**Qualifier Codes/Comments**

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

**Authorised By**

Harry Bacalis	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Julie Kay	Senior Analyst-Inorganic (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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Senversa Pty Ltd VIC  
Level 6, 15 William St  
Melbourne  
VIC 3000



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: **Lucinda Trickey**

Report **688915-W**  
Project name **ESA**  
Project ID **17571**  
Received Date **Nov 19, 2019**

Client Sample ID			QS01	QS04
Sample Matrix			Water	Water
Eurofins Sample No.			M19-No26589	M19-No26590
Date Sampled			Nov 19, 2019	Nov 19, 2019
Test/Reference	LOR	Unit		
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	-	< 0.05
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	-	< 0.1
<b>BTEX</b>				
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	108
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				
Naphthalene <sup>N02</sup>	0.01	mg/L	-	< 0.01
TRH C6-C10	0.02	mg/L	-	< 0.02
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	0.02	mg/L	-	< 0.02
TRH >C10-C16	0.05	mg/L	-	< 0.05
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	0.05	mg/L	-	< 0.05
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	-	< 0.1
<b>Polycyclic Aromatic Hydrocarbons</b>				
Acenaphthene	0.001	mg/L	-	< 0.001
Acenaphthylene	0.001	mg/L	-	< 0.001
Anthracene	0.001	mg/L	-	< 0.001
Benz(a)anthracene	0.001	mg/L	-	< 0.001
Benzo(a)pyrene	0.001	mg/L	-	< 0.001
Benzo(b&j)fluoranthene <sup>N07</sup>	0.001	mg/L	-	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	-	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	-	< 0.001
Chrysene	0.001	mg/L	-	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	-	< 0.001
Fluoranthene	0.001	mg/L	-	< 0.001
Fluorene	0.001	mg/L	-	< 0.001

Client Sample ID			QS01	QS04
Sample Matrix			Water	Water
Eurofins Sample No.			M19-No26589	M19-No26590
Date Sampled			Nov 19, 2019	Nov 19, 2019
Test/Reference	LOR	Unit		
<b>Polycyclic Aromatic Hydrocarbons</b>				
Indeno(1.2.3-cd)pyrene	0.001	mg/L	-	< 0.001
Naphthalene	0.001	mg/L	-	< 0.001
Phenanthrene	0.001	mg/L	-	< 0.001
Pyrene	0.001	mg/L	-	< 0.001
Total PAH*	0.001	mg/L	-	< 0.001
2-Fluorobiphenyl (surr.)	1	%	-	128
p-Terphenyl-d14 (surr.)	1	%	-	120
<b>Heavy Metals</b>				
Arsenic	0.001	mg/L	-	< 0.001
Cadmium	0.0002	mg/L	-	< 0.0002
Chromium	0.001	mg/L	-	< 0.001
Copper	0.001	mg/L	-	< 0.001
Lead	0.001	mg/L	-	< 0.001
Mercury	0.0001	mg/L	-	< 0.0001
Nickel	0.001	mg/L	-	< 0.001
Zinc	0.005	mg/L	-	< 0.005

**Sample History**

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

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 B7			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Nov 20, 2019	7 Days
BTEX - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Nov 20, 2019	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Nov 20, 2019	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Nov 20, 2019	
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Nov 20, 2019	7 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Nov 20, 2019	180 Days

<b>Company Name:</b> Senversa Pty Ltd VIC	<b>Order No.:</b>	<b>Received:</b> Nov 19, 2019 4:55 PM
<b>Address:</b> Level 6, 15 William St Melbourne VIC 3000	<b>Report #:</b> 688915	<b>Due:</b> Nov 26, 2019
<b>Project Name:</b> ESA	<b>Phone:</b> 9606 0070	<b>Priority:</b> 5 Day
<b>Project ID:</b> 17571	<b>Fax:</b>	<b>Contact Name:</b> Lucinda Trickey

**Eurofins Analytical Services Manager : Harry Bacalis**

Sample Detail						HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	TRH C6-C9	BTEX	Moisture Set	Eurofins   mgt Suite B7
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>						X	X	X	X	X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>												
<b>Brisbane Laboratory - NATA Site # 20794</b>												
<b>Perth Laboratory - NATA Site # 23736</b>												
<b>External Laboratory</b>												
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	SB7381_0.4-0.5	Nov 19, 2019		Soil	M19-No26582		X	X			X	X
2	SB7381_1.9-2.0	Nov 19, 2019		Soil	M19-No26583		X	X			X	X
3	SB7382_0.8-0.9	Nov 19, 2019		Soil	M19-No26584		X	X			X	X
4	SB7383_0.1-0.2	Nov 19, 2019		Soil	M19-No26585		X	X			X	X
5	SB7383_0.9-1.0	Nov 19, 2019		Soil	M19-No26586		X	X			X	X
6	SB7384_0.1-	Nov 19, 2019		Soil	M19-No26587		X	X			X	X

<b>Company Name:</b> Senversa Pty Ltd VIC	<b>Order No.:</b>	<b>Received:</b> Nov 19, 2019 4:55 PM
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**Eurofins Analytical Services Manager : Harry Bacalis**

Sample Detail			HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	TRH C6-C9	BTEX	Moisture Set	Eurofins   mgt Suite B7
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>			X	X	X	X	X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>									
<b>Brisbane Laboratory - NATA Site # 20794</b>									
<b>Perth Laboratory - NATA Site # 23736</b>									
	0.2								
7	SB7384_0.4-0.5	Nov 19, 2019			X	X		X	X
8	QS01	Nov 19, 2019				X	X		
9	QS04	Nov 19, 2019							X
10	SB7381_0.1-0.2	Nov 19, 2019							
11	SB7381_0.9-1.0	Nov 19, 2019							
12	SB7382_0.4-0.5	Nov 19, 2019							
13	SB7382_1.9-2.0	Nov 19, 2019							
14	SB7383_0.4-	Nov 19, 2019							

<b>Company Name:</b> Senversa Pty Ltd VIC	<b>Order No.:</b>	<b>Received:</b> Nov 19, 2019 4:55 PM
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**Eurofins Analytical Services Manager : Harry Bacalis**

Sample Detail						HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	TRH C6-C9	BTEX	Moisture Set	Eurofins   mgt Suite B7
<b>Melbourne Laboratory - NATA Site # 1254 &amp; 14271</b>						X	X	X	X	X	X	X
<b>Sydney Laboratory - NATA Site # 18217</b>												
<b>Brisbane Laboratory - NATA Site # 20794</b>												
<b>Perth Laboratory - NATA Site # 23736</b>												
	0.5											
15	SB7383_1.9-2.0	Nov 19, 2019		Soil	M19-No26596	X						
16	SB7384_0.9-1.0	Nov 19, 2019		Soil	M19-No26597	X						
17	SB7384_1.9-2.0	Nov 19, 2019		Soil	M19-No26598	X						
18	SB7382_0.1-0.2	Nov 19, 2019		Soil	M19-No26599		X	X			X	X
19	QS02	Nov 19, 2019		Soil	M19-No26600		X	X			X	X
<b>Test Counts</b>						8	9	9	1	1	9	10

**Internal Quality Control Review and Glossary**
**General**

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

**Holding Times**

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

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

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

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

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

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

**Units**

**mg/kg:** milligrams per kilogram

**mg/L:** milligrams per litre

**ug/L:** micrograms per litre

**ppm:** Parts per million

**ppb:** Parts per billion

**%:** Percentage

**org/100mL:** Organisms per 100 millilitres

**NTU:** Nephelometric Turbidity Units

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

**Terms**

<b>Dry</b>	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
<b>LOR</b>	Limit of Reporting.
<b>SPIKE</b>	Addition of the analyte to the sample and reported as percentage recovery.
<b>RPD</b>	Relative Percent Difference between two Duplicate pieces of analysis.
<b>LCS</b>	Laboratory Control Sample - reported as percent recovery.
<b>CRM</b>	Certified Reference Material - reported as percent recovery.
<b>Method Blank</b>	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.
<b>Surr - Surrogate</b>	The addition of a like compound to the analyte target and reported as percentage recovery.
<b>Duplicate</b>	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
<b>USEPA</b>	United States Environmental Protection Agency
<b>APHA</b>	American Public Health Association
<b>TCLP</b>	Toxicity Characteristic Leaching Procedure
<b>COC</b>	Chain of Custody
<b>SRA</b>	Sample Receipt Advice
<b>QSM</b>	US Department of Defense Quality Systems Manual Version 5.3
<b>CP</b>	Client Parent - QC was performed on samples pertaining to this report
<b>NCP</b>	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.
<b>TEQ</b>	Toxic Equivalency Quotient

**QC - Acceptance Criteria**

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

Results <10 times the LOR : No Limit

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

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

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

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

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

**QC Data General Comments**

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

**Quality Control Results**

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Method Blank</b>							
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>							
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	
<b>Method Blank</b>							
<b>BTEX</b>							
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	
<b>Method Blank</b>							
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>							
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	
<b>Method Blank</b>							
<b>Polycyclic Aromatic Hydrocarbons</b>							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
<b>Method Blank</b>							
<b>Heavy Metals</b>							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
<b>LCS - % Recovery</b>							
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>							
TRH C6-C9	%	95			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
TRH C10-C14	%	109			70-130	Pass		
<b>LCS - % Recovery</b>								
<b>BTEX</b>								
Benzene	%	92			70-130	Pass		
Toluene	%	94			70-130	Pass		
Ethylbenzene	%	92			70-130	Pass		
m&p-Xylenes	%	90			70-130	Pass		
Xylenes - Total	%	91			70-130	Pass		
<b>LCS - % Recovery</b>								
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>								
Naphthalene	%	115			70-130	Pass		
TRH C6-C10	%	100			70-130	Pass		
TRH >C10-C16	%	104			70-130	Pass		
<b>LCS - % Recovery</b>								
<b>Polycyclic Aromatic Hydrocarbons</b>								
Acenaphthene	%	109			70-130	Pass		
Acenaphthylene	%	112			70-130	Pass		
Anthracene	%	106			70-130	Pass		
Benz(a)anthracene	%	96			70-130	Pass		
Benzo(a)pyrene	%	83			70-130	Pass		
Benzo(b&j)fluoranthene	%	75			70-130	Pass		
Benzo(g,h,i)perylene	%	76			70-130	Pass		
Benzo(k)fluoranthene	%	107			70-130	Pass		
Chrysene	%	118			70-130	Pass		
Dibenz(a,h)anthracene	%	89			70-130	Pass		
Fluoranthene	%	92			70-130	Pass		
Fluorene	%	116			70-130	Pass		
Indeno(1,2,3-cd)pyrene	%	93			70-130	Pass		
Naphthalene	%	102			70-130	Pass		
Phenanthrene	%	105			70-130	Pass		
Pyrene	%	92			70-130	Pass		
<b>LCS - % Recovery</b>								
<b>Heavy Metals</b>								
Arsenic	%	102			80-120	Pass		
Cadmium	%	101			80-120	Pass		
Chromium	%	98			80-120	Pass		
Copper	%	104			80-120	Pass		
Lead	%	94			80-120	Pass		
Mercury	%	103			75-125	Pass		
Nickel	%	98			80-120	Pass		
Zinc	%	93			80-120	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
<b>Spike - % Recovery</b>								
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1				
TRH C6-C9	M19-No25321	NCP	%	105		70-130	Pass	
<b>Spike - % Recovery</b>								
<b>BTEX</b>				Result 1				
Benzene	M19-No25321	NCP	%	102		70-130	Pass	
Toluene	M19-No25321	NCP	%	102		70-130	Pass	
Ethylbenzene	M19-No25321	NCP	%	101		70-130	Pass	
m&p-Xylenes	M19-No25321	NCP	%	101		70-130	Pass	
o-Xylene	M19-No25321	NCP	%	104		70-130	Pass	
Xylenes - Total	M19-No25321	NCP	%	102		70-130	Pass	
<b>Spike - % Recovery</b>								

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1					
TRH C10-C14	B19-No27270	NCP	%	93			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1					
Naphthalene	M19-No25321	NCP	%	119			70-130	Pass	
TRH C6-C10	M19-No25321	NCP	%	108			70-130	Pass	
TRH >C10-C16	B19-No27270	NCP	%	87			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Polycyclic Aromatic Hydrocarbons</b>				Result 1					
Acenaphthene	M19-No25765	NCP	%	97			70-130	Pass	
Acenaphthylene	M19-No25765	NCP	%	96			70-130	Pass	
Anthracene	M19-No25765	NCP	%	72			70-130	Pass	
Benz(a)anthracene	M19-No25765	NCP	%	87			70-130	Pass	
Benzo(a)pyrene	M19-No25765	NCP	%	84			70-130	Pass	
Benzo(b&j)fluoranthene	M19-No25765	NCP	%	78			70-130	Pass	
Benzo(g,h,i)perylene	M19-No25765	NCP	%	93			70-130	Pass	
Benzo(k)fluoranthene	M19-No25765	NCP	%	86			70-130	Pass	
Chrysene	M19-No25765	NCP	%	87			70-130	Pass	
Dibenz(a,h)anthracene	M19-No25765	NCP	%	104			70-130	Pass	
Fluoranthene	M19-No25765	NCP	%	90			70-130	Pass	
Fluorene	M19-No25765	NCP	%	99			70-130	Pass	
Indeno(1,2,3-cd)pyrene	M19-No25765	NCP	%	98			70-130	Pass	
Naphthalene	M19-No25765	NCP	%	95			70-130	Pass	
Phenanthrene	M19-No25765	NCP	%	97			70-130	Pass	
Pyrene	M19-No25765	NCP	%	93			70-130	Pass	
<b>Spike - % Recovery</b>									
<b>Heavy Metals</b>				Result 1					
Mercury	M19-No29221	NCP	%	88			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
<b>Duplicate</b>									
<b>Total Recoverable Hydrocarbons - 1999 NEPM Fractions</b>				Result 1	Result 2	RPD			
TRH C10-C14	B19-No30370	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	B19-No30370	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	B19-No30370	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
<b>Duplicate</b>									
<b>Total Recoverable Hydrocarbons - 2013 NEPM Fractions</b>				Result 1	Result 2	RPD			
TRH >C10-C16	B19-No30370	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	B19-No30370	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	B19-No30370	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
<b>Duplicate</b>									
<b>Polycyclic Aromatic Hydrocarbons</b>				Result 1	Result 2	RPD			
Acenaphthene	M19-No21983	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M19-No21983	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M19-No21983	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M19-No21983	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M19-No21983	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M19-No21983	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g,h,i)perylene	M19-No21983	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M19-No21983	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	M19-No21983	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a,h)anthracene	M19-No21983	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	M19-No21983	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M19-No21983	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	M19-No21983	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

<b>Duplicate</b>										
<b>Polycyclic Aromatic Hydrocarbons</b>					Result 1	Result 2	RPD			
Naphthalene	M19-No21983	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass		
Phenanthrene	M19-No21983	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass		
Pyrene	M19-No21983	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass		
<b>Duplicate</b>										
<b>Heavy Metals</b>					Result 1	Result 2	RPD			
Mercury	M19-No29221	NCP	mg/L	0.0017	0.0015	13	30%	Pass		

**Comments**
**Sample Integrity**

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

**Qualifier Codes/Comments**

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

**Authorised By**

Harry Bacalis	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)


**Glenn Jackson**
**General Manager**

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

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SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : EM1919770

Client	: SENVERSA PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: LUCINDA TRICKEY	Contact	: Larissa Burns
Address	: 190 Flinders Street ADELAIDE SA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: lucinda.trickey@senversa.com.au	E-mail	: Larissa.burns@alsglobal.com
Telephone	: +61 03 9606 0070	Telephone	: +6138549 9644
Facsimile	: +61 03 9606 0074	Facsimile	: +61-3-8549 9626
Project	: 17571	Page	: 1 of 2
Order number	: ----	Quote number	: EM2017SENVVER0009 (EN/333 (secondary work only))
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: SO		

Dates

Date Samples Received	: 20-Nov-2019 08:55	Issue Date	: 20-Nov-2019
Client Requested Due Date	: 27-Nov-2019	Scheduled Reporting Date	: <b>27-Nov-2019</b>

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 9.5°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Sample(s) received in non-ALS container(s).**
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



## Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EA055-103 Moisture Content	SOIL - S-26 8 metals/TRH/BTEXN/PAH
EM1919770-001	19-Nov-2019 00:00	QS03	✓	✓

## Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

## Requested Deliverables

### LUCINDA TRICKEY

- |  |       |                                 |
|--|-------|---------------------------------|
| - *AU Certificate of Analysis - NATA (COA)                     | Email | lucinda.trickey@senversa.com.au |
| - *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)    | Email | lucinda.trickey@senversa.com.au |
| - *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)            | Email | lucinda.trickey@senversa.com.au |
| - A4 - AU Sample Receipt Notification - Environmental HT (SRN) | Email | lucinda.trickey@senversa.com.au |
| - A4 - AU Tax Invoice (INV)                                    | Email | lucinda.trickey@senversa.com.au |
| - Chain of Custody (CoC) (COC)                                 | Email | lucinda.trickey@senversa.com.au |
| - EDI Format - ENMRG (ENMRG)                                   | Email | lucinda.trickey@senversa.com.au |
| - EDI Format - ESDAT (ESDAT)                                   | Email | lucinda.trickey@senversa.com.au |

### SUPPLIER ACCOUNTS

- |                             |       |                                  |
|-----------------------------|-------|----------------------------------|
| - A4 - AU Tax Invoice (INV) | Email | supplieraccounts@senversa.com.au |
|-----------------------------|-------|----------------------------------|

**Laboratory:** mg/Eurofins VIC  
**Address:** 6 Monterey Road, Dandenong South, VIC 3175  
**Contact:** Harry Bacalis/ Sample Log In  
**Phone:** 03 9564 7055

Chain of Custody Documentation

3

**Job Number:** 17571 **Purchase Order:**  
**Project Name:** ESA **Quote No:**  
**Sampled By:** SO **Turn Around Time:** STANDARD  
**Project Manager:** Lucinda Trickey **Page:** of  
**Email Report To:** lucinda.trickey@senversa.com.au **Phone/Mobile:** +61 424 172 065

Sample Information						Analysis Required																
Lab ID	Sample ID	Matrix *	Date	Time	Container Information Type / Code	Total Bottles	B7 - TRH / PAH / BTEX / 8 metals	Sulphate	pH	TRH (C6-C9) and BTEX												
	SB7381_0.1-0.2	Soil	19/11/2019	AM		1 Jar																
	SB7381_0.4-0.5	Soil	19/11/2019	AM		1 Jar	X	X	X													
	SB7381_0.9-1.0	Soil	19/11/2019	AM		1 Jar																
	SB7381_1.9-2.0	Soil	19/11/2019	AM		1 Jar	X	X	X													
	SB7382_0.1-0.2	Soil	19/11/2019	AM		1 Jar	X	X	X													
	SB7382_0.4-0.5	Soil	19/11/2019	AM		1 Jar																
	SB7382_0.8-0.9	Soil	19/11/2019	AM		1 Jar	X	X	X													
	SB7382_1.9-2.0	Soil	19/11/2019	AM		1 Jar																
	SB7383_0.1-0.2	Soil	19/11/2019	AM		1 Jar	X	X	X													
	SB7383_0.4-0.5	Soil	19/11/2019	AM		1 Jar																
	SB7383_0.9-1.0	Soil	19/11/2019	AM		1 Jar	X	X	X													
	SB7383_1.9-2.0	Soil	19/11/2019	AM		1 Jar																
	SB7384_0.1-0.2	Soil	19/11/2019	AM		1 Jar	X	X	X													
	SB7384_0.4-0.5	Soil	19/11/2019	AM		1 Jar	X	X	X													
	SB7384_0.9-1.0	Soil	19/11/2019	AM		1 Jar																
	SB7384_1.9-2.0	Soil	19/11/2019	AM		1 Jar																
	QS01	Water																				
	QS02	Soil	19/11/2019	AM		1 Jar	X															
	QS03	Soil	19/11/2019	AM		1 Jar	X															
	QS04	Water					X															
<b>Total</b>							11	8	8	1												

Environmental Division  
Melbourne  
Work Order Reference  
**EM1919770**



Telephone : + 61-3-8549 9600

Please forward to ALS

**Sampler:** I attest that proper field sampling procedures in accordance with Senversa standard procedures and/or project specifications were used during the collection of these samples: **Sampler Name:** **Signature:** **Date:**

Relinquished By:		Method of Shipment (if applicable):		Received by:	
Name/Signature: Sam O'Connor	Date: 19/11/19	Carrier / Reference #:		Name/Signature: <i>[Signature]</i>	Date: 20/11
Of: Senversa	Time: 2:10 PM	Date/Time: <i>[Signature]</i>		Of: <i>[Signature]</i>	Time: 9:25
Name/Signature: <i>[Signature]</i>	Date: 20/11/19	Carrier / Reference #:		Name/Signature:	Date:
Of: EUROFINS	Time: 2:30 PM	Date/Time: <i>[Signature]</i>		Of:	Time:
Name/Signature:	Date:	Carrier / Reference #:		Name/Signature:	Date:
Of:	Time:	Date/Time:		Of:	Time:

**Water Container Codes:** P = Unpreserved Plastic; N = Nitric Acid (HNO<sub>3</sub>) Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide (NaOH)/Cadmium (Cd) Preserved; S = Sodium Hydroxide Preserved Plastic; STH = Sodium thiosulfate preserved plastic; V = VOA Vial Hydrochloric Acid (HCl) Preserved; VS = VOA Vial Sulphuric Preserved; VSA = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulphuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; UA = Unpreserved Amber Glass; L=Lugol's iodine preserved white plastic bottle; SW= sulfuric acid preserved wide mouth glass jar

Completed by: \_\_\_\_\_  
Checked by: \_\_\_\_\_

## CERTIFICATE OF ANALYSIS

<b>Work Order</b> : <b>EM1919770</b> <b>Client</b> : <b>SENVERSA PTY LTD</b> <b>Contact</b> : LUCINDA TRICKEY <b>Address</b> : 190 Flinders Street ADELAIDE SA 5000 <b>Telephone</b> : +61 03 9606 0070 <b>Project</b> : 17571 <b>Order number</b> : ---- <b>C-O-C number</b> : ---- <b>Sampler</b> : SO <b>Site</b> : ---- <b>Quote number</b> : EN/333 (secondary work only) <b>No. of samples received</b> : 1 <b>No. of samples analysed</b> : 1	<b>Page</b> : 1 of 6 <b>Laboratory</b> : Environmental Division Melbourne <b>Contact</b> : Larissa Burns <b>Address</b> : 4 Westall Rd Springvale VIC Australia 3171  <b>Telephone</b> : +6138549 9644 <b>Date Samples Received</b> : 20-Nov-2019 08:55 <b>Date Analysis Commenced</b> : 21-Nov-2019 <b>Issue Date</b> : 26-Nov-2019 16:29
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

### Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC



## General Comments

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

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

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

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

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

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

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

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Client sample ID			QS03	----	----	----	----
Client sampling date / time		19-Nov-2019 00:00			----	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1919770-001	-----	-----	-----	-----	-----
				Result	----	----	----	----	----
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>									
Moisture Content	----	1.0	%	20.9	----	----	----	----	----
<b>EG005(ED093)T: Total Metals by ICP-AES</b>									
Arsenic	7440-38-2	5	mg/kg	10	----	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----	----
Chromium	7440-47-3	2	mg/kg	21	----	----	----	----	----
Copper	7440-50-8	5	mg/kg	94	----	----	----	----	----
Lead	7439-92-1	5	mg/kg	42	----	----	----	----	----
Nickel	7440-02-0	2	mg/kg	31	----	----	----	----	----
Zinc	7440-66-6	5	mg/kg	169	----	----	----	----	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>									
Mercury	7439-97-6	0.1	mg/kg	0.2	----	----	----	----	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	2.0	----	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	2.6	----	----	----	----	----
Benzo(a)anthracene	56-55-3	0.5	mg/kg	1.7	----	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	1.7	----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	3.0	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	1.1	----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	2.6	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	0.9	----	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	1.0	----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	16.6	----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	3.3	----	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	3.5	----	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	3.8	----	----	----	----	----
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----	----



## Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QS03	----	----	----	----
Client sampling date / time				19-Nov-2019 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	EM1919770-001	-----	-----	-----	-----	
				Result	----	----	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons - Continued</b>									
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----	
C15 - C28 Fraction	----	100	mg/kg	400	----	----	----	----	
C29 - C36 Fraction	----	100	mg/kg	280	----	----	----	----	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	680	----	----	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----	
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	----	----	
>C16 - C34 Fraction	----	100	mg/kg	600	----	----	----	----	
>C34 - C40 Fraction	----	100	mg/kg	140	----	----	----	----	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	740	----	----	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	----	----	----	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----	
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	----	----	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	----	----	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	----	----	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	----	----	
^ Total Xylenes	----	0.5	mg/kg	<0.5	----	----	----	----	
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----	
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	0.5	%	100	----	----	----	----	
2-Chlorophenol-D4	93951-73-6	0.5	%	91.7	----	----	----	----	
2,4,6-Tribromophenol	118-79-6	0.5	%	74.4	----	----	----	----	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	0.5	%	109	----	----	----	----	
Anthracene-d10	1719-06-8	0.5	%	87.8	----	----	----	----	
4-Terphenyl-d14	1718-51-0	0.5	%	103	----	----	----	----	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	69.2	----	----	----	----	
Toluene-D8	2037-26-5	0.2	%	77.5	----	----	----	----	



**Analytical Results**

Sub-Matrix: <b>SOIL</b> (Matrix: <b>SOIL</b> )				Client sample ID	<b>QS03</b>	----	----	----	----
				Client sampling date / time	19-Nov-2019 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		<b>EM1919770-001</b>	-----	-----	-----	-----
				Result		----	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates - Continued</b>									
<b>4-Bromofluorobenzene</b>	460-00-4	0.2	%		<b>110</b>	----	----	----	----



## Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2,4,6-Tribromophenol	118-79-6	34	122
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

## QUALITY CONTROL REPORT

<b>Work Order</b>	: <b>EM1919770</b>	Page	: 1 of 7
Client	: <b>SENVERSA PTY LTD</b>	Laboratory	: Environmental Division Melbourne
Contact	: LUCINDA TRICKEY	Contact	: Larissa Burns
Address	: 190 Flinders Street ADELAIDE SA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 03 9606 0070	Telephone	: +6138549 9644
Project	: 17571	Date Samples Received	: 20-Nov-2019
Order number	: ----	Date Analysis Commenced	: 21-Nov-2019
C-O-C number	: ----	Issue Date	: 26-Nov-2019
Sampler	: SO		
Site	: ----		
Quote number	: EN/333 (secondary work only)		
No. of samples received	: 1		
No. of samples analysed	: 1		



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

This Quality Control Report contains the following information:

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

### Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC



## General Comments

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

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

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

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

## Laboratory Duplicate (DUP) Report

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

Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2716222)</b>									
EM1919716-004	Anonymous	EG005T: Nickel	7440-02-0	2	mg/kg	51	53	2.98	0% - 20%
EM1919716-004	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	98	82	17.7	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	7	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	23	21	11.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	13	12	10.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	24	23	7.76	No Limit
EM1919716-028	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	112	103	8.61	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	24	23	4.73	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	19	16	18.2	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	14	14	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	12	14	12.5	No Limit
<b>EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2715825)</b>									
EM1919752-023	Anonymous	EA055: Moisture Content	----	0.1	%	9.5	10.3	7.45	0% - 20%
EM1919752-049	Anonymous	EA055: Moisture Content	----	0.1	%	17.0	18.8	10.1	0% - 20%
<b>EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2716221)</b>									
EM1919716-004	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1919716-028	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2718350)</b>									
EM1919714-056	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit



Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2718350) - continued</b>									
EM1919714-056	Anonymous	EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EM1919770-001	QS03	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5
EP075(SIM): Acenaphthylene	208-96-8			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Acenaphthene	83-32-9			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Fluorene	86-73-7			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Phenanthrene	85-01-8			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Anthracene	120-12-7			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Fluoranthene	206-44-0			0.5	mg/kg	2.0	<0.5	119	No Limit
EP075(SIM): Pyrene	129-00-0			0.5	mg/kg	2.6	<0.5	137	No Limit
EP075(SIM): Benz(a)anthracene	56-55-3			0.5	mg/kg	1.7	<0.5	110	No Limit
EP075(SIM): Chrysene	218-01-9			0.5	mg/kg	1.7	<0.5	110	No Limit
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3			0.5	mg/kg	3.0	<0.5	143	No Limit
EP075(SIM): Benzo(k)fluoranthene	207-08-9			0.5	mg/kg	1.1	<0.5	75.4	No Limit
EP075(SIM): Benzo(a)pyrene	50-32-8			0.5	mg/kg	2.6	<0.5	134	No Limit
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5			0.5	mg/kg	0.9	<0.5	58.2	No Limit
EP075(SIM): Dibenz(a,h)anthracene	53-70-3			0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM): Benzo(g,h,i)perylene	191-24-2			0.5	mg/kg	1.0	<0.5	66.9	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2715734)</b>									
EM1919752-013	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	563	# 445	23.5	0% - 20%
EM1919752-035	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2718349)</b>									
EM1919714-056	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1919770-001	QS03	EP071: C15 - C28 Fraction	----	100	mg/kg	400	140	99.2	No Limit



Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
<b>EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2718349) - continued</b>										
EM1919770-001	QS03	EP071: C29 - C36 Fraction	----	100	mg/kg	280	130	73.9	No Limit	
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit	
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	680	# 270	86.3	0% - 50%	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2715734)</b>										
EM1919752-013	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	736	# 577	24.2	0% - 20%	
EM1919752-035	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2718349)</b>										
EM1919714-056	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit	
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit	
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit	
EM1919770-001	QS03	EP071: >C16 - C34 Fraction	----	100	mg/kg	600	230	90.7	No Limit	
		EP071: >C34 - C40 Fraction	----	100	mg/kg	140	<100	35.1	No Limit	
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit	
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	740	# 230	105	0% - 50%	
<b>EP080: BTEXN (QC Lot: 2715734)</b>										
EM1919752-013	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	36.7	# 29.3	22.4	0% - 20%	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	24.7	# 19.8	22.0	0% - 20%	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	127	105	19.3	0% - 20%	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	56.8	# 45.4	22.4	0% - 20%	
EM1919752-035	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	5	4	21.9	No Limit	
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit	
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit			



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

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

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2716222)</b>									
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	90.7	78.5	107	
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	83.1	76.2	108	
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	99.1	77.7	110	
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	93.9	78.1	108	
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	82.8	78.4	106	
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	91.6	79.9	109	
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	87.2	79.1	110	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 2716221)</b>									
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	95.9	76.9	110	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2718350)</b>									
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	104	84.6	128	
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	99.2	76.9	127	
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	97.4	85.3	128	
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	96.0	82.1	126	
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	91.8	85.4	133	
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	94.4	88.7	136	
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	94.6	83.4	136	
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	98.3	85.1	140	
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	91.3	80.7	130	
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	98.8	85.2	141	
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	3 mg/kg	97.4	68.5	120	
	205-82-3								
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	115	80.1	132	
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	95.7	67.4	120	
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	93.2	66.0	126	
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	94.3	65.4	127	
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	93.6	67.8	127	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2715734)</b>									
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	108	61.2	127	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2718349)</b>									
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	750 mg/kg	110	71.8	129	
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3040 mg/kg	107	83.9	125	
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1450 mg/kg	108	77.9	119	
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2715734)</b>									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	105	59.5	125	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2718349)</b>									
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1090 mg/kg	109	72.2	128	
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3930 mg/kg	108	82.1	122	
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	268 mg/kg	115	55.1	131	
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----	
<b>EP080: BTEXN (QCLot: 2715734)</b>									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	92.9	62.7	119	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	102	66.6	126	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	101	66.3	124	
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	113	67.5	128	
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	113	73.0	128	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	90.4	61.2	123	

### Matrix Spike (MS) Report

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

Sub-Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery(%)		Recovery Limits (%)	
					MS	Low	High	
<b>EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2716222)</b>								
EM1919716-008	Anonymous	EG005T: Chromium	7440-47-3	50 mg/kg	93.0	79.0	121	
EM1919716-008	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	83.3	78.0	124	
		EG005T: Cadmium	7440-43-9	50 mg/kg	86.0	84.0	116	
		EG005T: Copper	7440-50-8	50 mg/kg	92.5	82.0	124	
		EG005T: Lead	7439-92-1	50 mg/kg	84.3	76.0	124	
		EG005T: Nickel	7440-02-0	50 mg/kg	87.4	78.0	120	
		EG005T: Zinc	7440-66-6	50 mg/kg	83.2	74.0	128	
<b>EG035T: Total Recoverable Mercury by FIMS (QCLot: 2716221)</b>								
EM1919716-008	Anonymous	EG035T: Mercury	7439-97-6	0.5 mg/kg	101	76.0	116	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2718350)</b>								
EM1919714-096	Anonymous	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	108	67.0	117	
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	107	52.0	148	
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2715734)</b>								
EM1919752-014	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	87.4	42.0	131	



Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
<b>EP080/071: Total Petroleum Hydrocarbons (QCLot: 2718349)</b>							
EM1919714-061	Anonymous	EP071: C10 - C14 Fraction	----	750 mg/kg	109	53.0	123
		EP071: C15 - C28 Fraction	----	3040 mg/kg	106	70.0	124
		EP071: C29 - C36 Fraction	----	1450 mg/kg	107	64.0	118
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2715734)</b>							
EM1919752-014	Anonymous	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	84.2	39.0	129
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2718349)</b>							
EM1919714-061	Anonymous	EP071: >C10 - C16 Fraction	----	1090 mg/kg	108	65.0	123
		EP071: >C16 - C34 Fraction	----	3930 mg/kg	107	67.0	121
		EP071: >C34 - C40 Fraction	----	268 mg/kg	113	44.0	126
<b>EP080: BTEXN (QCLot: 2715734)</b>							
EM1919752-014	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	88.1	50.0	136
		EP080: Toluene	108-88-3	2 mg/kg	84.6	56.0	139

## QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EM1919770	Page	: 1 of 5
Client	: SENVERSA PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: LUCINDA TRICKEY	Telephone	: +6138549 9644
Project	: 17571	Date Samples Received	: 20-Nov-2019
Site	: ----	Issue Date	: 26-Nov-2019
Sampler	: SO	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- Duplicate outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

#### Outliers : Analysis Holding Time Compliance

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

#### Outliers : Frequency of Quality Control Samples

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



### Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
<b>Duplicate (DUP) RPDs</b>							
EP080/071: Total Petroleum Hydrocarbons	EM1919770--001	QS03	<b>C10 - C36 Fraction (sum)</b>	----	86.3 %	0% - 50%	<b>RPD exceeds LOR based limits</b>
EP080/071: Total Petroleum Hydrocarbons	EM1919752--013	Anonymous	<b>C6 - C9 Fraction</b>	----	23.5 %	0% - 20%	<b>RPD exceeds LOR based limits</b>
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM1919770--001	QS03	<b>&gt;C10 - C40 Fraction (sum)</b>	----	105 %	0% - 50%	<b>RPD exceeds LOR based limits</b>
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM1919752--013	Anonymous	<b>C6 - C10 Fraction</b>	C6_C10	24.2 %	0% - 20%	<b>RPD exceeds LOR based limits</b>
EP080: BTEXN	EM1919752--013	Anonymous	<b>Toluene</b>	108-88-3	22.4 %	0% - 20%	<b>RPD exceeds LOR based limits</b>
EP080: BTEXN	EM1919752--013	Anonymous	<b>Ethylbenzene</b>	100-41-4	22.0 %	0% - 20%	<b>RPD exceeds LOR based limits</b>
EP080: BTEXN	EM1919752--013	Anonymous	<b>ortho-Xylene</b>	95-47-6	22.4 %	0% - 20%	<b>RPD exceeds LOR based limits</b>

### Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EA055: Moisture Content (Dried @ 105-110°C)</b>							
Soil Glass Jar - Unpreserved (EA055) QS03	19-Nov-2019	----	----	----	21-Nov-2019	03-Dec-2019	✓
<b>EG005(ED093)T: Total Metals by ICP-AES</b>							
Soil Glass Jar - Unpreserved (EG005T) QS03	19-Nov-2019	22-Nov-2019	17-May-2020	✓	22-Nov-2019	17-May-2020	✓
<b>EG035T: Total Recoverable Mercury by FIMS</b>							
Soil Glass Jar - Unpreserved (EG035T) QS03	19-Nov-2019	22-Nov-2019	17-Dec-2019	✓	23-Nov-2019	17-Dec-2019	✓
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP075(SIM)) QS03	19-Nov-2019	22-Nov-2019	03-Dec-2019	✓	23-Nov-2019	01-Jan-2020	✓
<b>EP080/071: Total Petroleum Hydrocarbons</b>							
Soil Glass Jar - Unpreserved (EP080) QS03	19-Nov-2019	22-Nov-2019	03-Dec-2019	✓	22-Nov-2019	03-Dec-2019	✓
Soil Glass Jar - Unpreserved (EP071) QS03	19-Nov-2019	22-Nov-2019	03-Dec-2019	✓	23-Nov-2019	01-Jan-2020	✓



Matrix: **SOIL**

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

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>							
<b>Soil Glass Jar - Unpreserved (EP080)</b> QS03	19-Nov-2019	22-Nov-2019	03-Dec-2019	✓	22-Nov-2019	03-Dec-2019	✓
<b>Soil Glass Jar - Unpreserved (EP071)</b> QS03	19-Nov-2019	22-Nov-2019	03-Dec-2019	✓	23-Nov-2019	01-Jan-2020	✓
<b>EP080: BTEXN</b>							
<b>Soil Glass Jar - Unpreserved (EP080)</b> QS03	19-Nov-2019	22-Nov-2019	03-Dec-2019	✓	22-Nov-2019	03-Dec-2019	✓



## Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: \* = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	3	18	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
<b>Laboratory Control Samples (LCS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
<b>Method Blanks (MB)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
<b>Matrix Spikes (MS)</b>							
PAH/Phenols (SIM)	EP075(SIM)	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	18	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard



## Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 6.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl <sub>2</sub> ) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl <sub>2</sub> which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.
Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na <sub>2</sub> SO <sub>4</sub> and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.



## Appendix F: Waste Transport Certificate



ENVIRONMENT PROTECTION ACT 1970

## WASTE TRANSPORT CERTIFICATE

**No authorisation for input. Scroll down to view Summary Section or Certificate.**

## SUMMARY

Certificate Number	0050759811		
<b>Waste Producer Details</b>			
Name of Waste Producer	QEST ENVIRONMENTS (9426 available)		
Address of Site of Waste Source	34-36 EDOLS ST, NORTH GEELONG VIC 3215		
Waste Origin			
Name of Emergency Contact	Mrs. Rachel Morrison		
Emergency Contact Phone	0352773204		
Consignment Number			
<b>Description of Waste</b>			
Waste Code	N121		
Waste Form	P		
Class	9		
Packing Group	N/A		
U.N. Number	3082		
Description of Waste	Hydro Slurry		
Hazard Category	C		
Contaminants	13		
Bulk / No. of Packages	Bulk		
Waste Amount Unknown			
Amount of Waste	2,000	L	
Producer Comments	Senversa Pty Ltd - South Wharf Port Melbourne		
<b>Proposed Waste Disposal</b>			
Proposed Disposal / Treatment / Storage Site	RTD ENVIRONMENTAL PTY LTD [DERRIMUT]		
Intended Disposal Option	Chem/Phys Treatment		
Proposed Waste Transporter	QEST ENVIRONMENTS		

**Waste Transporter Details**

Name of Waste Transporter	QEST ENVIRONMENTS
Address of Waste Transporter	34-36 EDOLS ST, NORTH GEELONG VIC 3215
Vehicle Registration	1KJ5AT
Vehicle Transport Permit Number	159330
Trailer Registration	
Trailer Transport Permit Number	
Driver's Name	NATHAN ILEWIS
Waste Transportation Date	19/11/2019

**Waste Receiver Details**

Name of Waste Receiver	RTD ENVIRONMENTAL PTY LTD [DERRIMUT]
Address of Waste Receiver	33-37 EAST DERRIMUT CR., DERRIMUT VIC 3030
Waste Receiver Licence No.	120773
Waste Received Date	19/11/2019
Type of Treatment	D9C
Amount of Waste	2,000 L
Discrepancies	
Discrepancy Reasons	
Discrepancy ( Comments )	
Other Waste Receiver State	NONE
Waste Receiver Other	
Waste Receiver Other Address	
Final Intended Disposal Option	
Part C Submitted By	Ms. Suzy Jankovic

## Certificate No. 0050759811

### Part A: Completed by the Producer of Waste

Name of Waste Producer			
QEST ENVIRONMENTS (9426 available)			
Address of Site of Waste Source			Waste origin
34-36 EDOLS ST, NORTH GEELONG VIC 3215			
Name of Emergency Contact			Emergency Contact Phone
Mrs. Rachel Morrison			0352773204
Consignment No	Waste Code No		Class
	P	N121	9
Packing Group	U.N. Number		
N/A	3082		
Description of Waste			
Hydro Slurry			
Hazard Category	Contaminants		Bulk/No. of Packages
C	13		Bulk
			Amount of Waste
			2,000 L
Producer Comments			
Senversa Pty Ltd - South Wharf Port Melbourne			
Proposed Disposal / Treatment / Storage Site			State
RTD ENVIRONMENTAL PTY LTD [DERRIMUT]			VIC
Intended Disposal Option	Proposed Waste Transporter		
Chem/Phys Treatment	QEST ENVIRONMENTS		
I declare that to the best of my knowledge and belief, the above information is true and correct		Submitted by	Date
		Mrs. Rachel Morrison	19/11/2019

### Part B: Completed by the Transporter of Waste

Name of Transporter			
QEST ENVIRONMENTS			
Address of Transporter			
34-36 EDOLS ST, NORTH GEELONG VIC 3215			
Vehicle Registration	Transport Permit No	Trailer Registration	Trailer Permit No
1KJ5AT	159330		
I acknowledge receipt of the waste described in Part A		Driver's Name	Date
		NATHAN ILEWIS	19/11/2019

### Part C: Completed by the Waste Receiver

Name of Disposal/Treatment/Storage Facility			
RTD ENVIRONMENTAL PTY LTD [DERRIMUT]			
Address			Licence No
33-37 EAST DERRIMUT CR., DERRIMUT VIC 3030			120773
Waste Received Date	Type of Treatment	Amount of Waste	
19/11/2019	D9C	2,000 L	
Are there any discrepancies between the wastes described above and the waste received			
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Discrepancy:			
Waste Receiver Other			Final intended disposal option
Address			State
			NONE
I acknowledge receipt of the waste described in Part A		Submitted by	Date
		Ms. Suzy Jankovic	19/11/2019

## Certificate No. 0050732373

### Part A: Completed by the Producer of Waste

Name of Waste Producer						
SENVERSA PTY LTD [MELBOURNE] (100 available)						
Address of Site of Waste Source					Waste origin	
Level 6, 15 WILLIAM STREET, MELBOURNE, 3000 VIC					33 South Wharf, Port Melbou	
Name of Emergency Contact					Emergency Contact Phone	
Steven Brazil					0417553604	
Consignment No		Waste Code No		Class		
		L J120		N/A		
Packing Group			U.N. Number			
N/A			30XY			
Description of Waste						
Groundwater						
Hazard Category		Contaminants		Bulk/No. of Packages		Amount of Waste
N				1		100 L
Producer Comments						
Producer - Port of Melbourne						
Proposed Disposal / Treatment / Storage Site						State
CLEANAWAY CO PTY LTD [LAVERTON NORTH]						VIC
Intended Disposal Option		Proposed Waste Transporter				
Other		GREENCARE ENVIRONMENTAL SOLUTIONS P LTD				
I declare that to the best of my knowledge and belief, the above information is true and correct				Submitted by		Date
				Helen Lawrence		10/10/2019

### Part B: Completed by the Transporter of Waste

Name of Transporter			
GREENCARE ENVIRONMENTAL SOLUTIONS PTY LTD			
Address of Transporter			
61 YORK ST, SOUTH MELBOURNE VIC 3205			
Vehicle Registration	Transport Permit No	Trailer Registration	Trailer Permit No
XV72BO	187576		
I acknowledge receipt of the waste described in Part A			Driver's Name
			Antony Holmes
			Date
			10/10/2019



## **Appendix G: Quality Assurance / Quality Control**



## Appendix G: Quality Assurance / Quality Control

The data quality assurance and control (QA/QC) procedures adopted by Senversa provide a consistent approach to evaluation of whether the data quality objectives (DQO's) required by the project have been achieved. The process focuses on assessment of the useability of the data in terms of accuracy and reliability in forming conclusions on the condition of the element of the environment being investigated. The approach is generally based on guidance from the following sources:

- Australian Standard (AS) 4482.1-2005: *Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds.*
- National Environment Protection Council (NEPC), *National Environment Protection (Assessment of Site Contamination) Amendment Measure No. 1 2013 (NEPM), Schedule B2: Guideline on Site Characterisation.*
- NEPC – *National Environment Protection (Assessment of Site Contamination) Amendment Measure No. 1 2013 (NEPM), Schedule B3: Guideline on Laboratory Analysis of Potentially Contaminated Soils.*
- United States Environmental Protection Agency (USEPA) – *Guidance on Systematic Planning Using the Data Quality Objectives Process (EPA QA/G-4).*
- USEPA – *Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8).*

### Quality Assurance Procedure

The following data quality objectives, measures and acceptance criteria were adopted to verify compliance with the planned QA procedures:

Quality Assurance Process	Data Quality Element	Objectives and Measure	Acceptance Criteria
<b>Standard Procedures</b>	Comparability, Reproducibility, Representativeness	Standard field sampling procedures and forms used	No deviation from standard procedure and forms used
<b>Equipment Calibration</b>	Accuracy	All equipment calibrated in accordance with manufacturers specifications	All equipment calibrated in accordance with manufacturers specifications
<b>Testing Method Accreditation</b>	Accuracy and Comparability	NATA accredited methods used for all analyses determined	Primary and secondary laboratories to use NATA accredited methods for all analytes determined
<b>Quality Control Sampling Frequency</b>	Precision and Repeatability	Field QC sampling frequency in accordance with AS4482.1-2005	Field Duplicates – $\geq 1$ in 20 primary samples Secondary Duplicates – $\geq 1$ in 20 primary samples Rinsate Blanks – $\geq 1$ per day, per matrix per equipment Trip Blanks – $\geq 1$ per esky containing samples for volatile analyses



Quality Assurance Process	Data Quality Element	Objectives and Measure	Acceptance Criteria
	Accuracy, Precision and Comparability	Laboratory QC analysis frequency in accordance with NEPC (2013), Schedule B3	Laboratory Duplicates – at least 1 in 10 analyses or one per process batch Method Blanks – at least 1 per process batch Surrogate Recoveries – all samples spiked where appropriate (e.g. chromatographic analysis of organics) Laboratory Control Samples – at least 1 per process batch Matrix Spikes – at least 1 per matrix type per process batch
<b>Sample Preservation, Handling and Holding Times</b>	Accuracy	Samples appropriately preserved upon collection, stored and transported, and analysed within holding times	Sample containers, holding times and preservation in accordance laboratory specific method requirements.
<b>Data Management</b>	Accuracy	No errors in data transcription	Entry of field data verified by peer.
<b>Data Useability</b>	Completeness	Limits of reporting less than adopted beneficial use investigation levels. Sample volumes and analytical methods selected to enable required limits of reporting to be achieved	Limits of reporting less than investigation levels.

## Quality Control Sampling and Analysis

The following data quality objectives, measures and acceptance criteria were adopted to evaluate the validity of the analytical data produced.

Quality Control Process	Data Quality Element	Objectives and Measure	Acceptance Criteria
<b>Field Duplicate Sampling and Analysis</b>	Precision and Field Repeatability	Field duplicate samples used assess the variability in analyte concentration between samples collected from the sample location and the reproducibility of the laboratory analysis. Where required, resubmission of previously analysed samples for chemicals within their holding times may be undertaken to further assess level of precision.	Analysed for same chemicals as primary sample RPD <sup>1</sup> <30% of mean concentration where both concentrations >20 x limit of reporting RPD <50% of mean concentration where higher concentration 10 – 20 x limit of reporting RPD - No limit where both concentrations < 10 x limit of reporting
<b>Secondary Duplicate Sampling and Analysis</b>	Accuracy	Results are accurate and free from laboratory error. Secondary duplicate samples sent to a secondary laboratory to assess the accuracy of the analyte concentrations reported by the primary laboratory	Analysed for same chemicals as primary sample RPD <30% of mean concentration where both concentrations >20 x limit of reporting RPD <50% of mean concentration where higher concentration 10 – 20 x limit of reporting RPD - No limit where both concentrations < 10 x limit of reporting

<sup>1</sup> Relative Percent Difference (%): Calculated as: (Result No.1 – Result No. 2/Mean Result)\*100



Quality Control Process	Data Quality Element	Objectives and Measure	Acceptance Criteria
<b>Field Rinsate Blank Preparation and Analysis</b>	Accuracy and Representativeness	<p>Cross contamination of samples does not occur between sampling locations due to carry-over from sampling equipment.</p> <p>Rinsate blank samples prepared for each sampling procedure. Where possible the rinsate blanks are prepared immediately after sampling locations known to contain concentrations of the chemicals of concern above the limit of quantification and / or before sampling locations where the chemicals being targeted in the laboratory analysis are to be compared to investigation levels near the limit of quantification of the chemical.</p>	Analyte concentrations below limits of reporting
<b>Trip Blank Sampling and Analysis</b>	Accuracy and Representativeness	<p>Cross contamination between samples does not occur in transit or as an artefact of the sample handling procedure.</p> <p>Trip blank samples prepared by the laboratory which accompany the empty sampling containers from the laboratory to the sampling site, and return with the samples to the laboratory to assess whether cross contamination occurs between samples or as an artefact of the sampling procedure.</p>	Analyte concentrations below limits of reporting
<b>Laboratory QC Analysis</b>	Laboratory Precision and Accuracy	Laboratory duplicates	As specified by the laboratory.
		Laboratory control spike	Dynamic recovery limits as specified by the laboratory.
		Certified reference material	As specified by the laboratory (generally dynamic recovery limits).
		Surrogate recovery	Dynamic recovery limits as specified by the laboratory.
		Matrix spike recovery	Recovery 70% – 130% or dynamic recovery limits specified by laboratory. However note that recovery of phenols is generally significantly lower and a recovery in the range 20% to 130% is considered acceptable by most laboratories.
		Matrix spike recovery duplicate	RPD < 30%, or as specified by the laboratory.

## Data Verification and Validation

The data validation process involved the checking of analytical procedure compliance with acceptance criteria and an assessment of the accuracy and precision of analytical data from the range of quality control indicators generated from both the sampling and analytical programmes.

The checks undertaken are summarised in the attached data validation checklist tables (one table per sample batch/delivery group). Field replicate and field blank analytical results relevant to the project are summarised in **Table G-1, Table G-2 and Table G-3.**



Instances where the data quality acceptance criteria were not achieved are discussed below:

### **Trip Blanks**

No trip blanks were collected for the soil investigation. This non-conformance is only considered minor given all primary samples reported concentrations of TRH (C6-C9 Fraction) below LOR.

### **Field Duplicate RPDs**

Relative percentage difference between results received for some soil analyses undertaken for reports 688915 and EM1919770 exceeded acceptance limits. This is considered likely due to the heterogeneous nature of the fill soils sampled. Overall, duplicate results appear comparable and indicate that the results can be considered representative.

### **Laboratory Quality Control Sampling Frequency**

The expected frequency for matrix spikes in report EM1917208 (Soil) was not met for sulfate and in report EM1917008 (Water) for TRH and VOCs. The expected frequency was also not met for TRH in report EM1917008 (Water) for laboratory duplicates.

These non-conformances were isolated and not considered to impact on the overall representativeness of the data.

### **Holding Time**

A holding time breach was reported for pH by PC titrator in report EM1917008 (Water). While the analysis was requested 6 days late, the accepted holding time for pH is 6 hours and therefore not considered feasible to analyse within holding time.

In-field measurements of pH were also collected immediately prior to sampling and are considered suitably representative of conditions. The comparison indicates in-field measurements of pH in groundwater is slightly more acidic than what is reported in the laboratory results. For interpretation purposes, the in-field measurements have been utilised as a conservative approach.

### **Rinsate Blank**

A low-level detection of Ammonia (as N) and Sulphate (as SO<sub>4</sub>) was identified in report EM1917008 (Water) for the rinsate sample. This is potentially due to incorrect rinsate water and bottles being used. The SAQP indicates that only metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg), TRH and BTEX were to be analysed for a rinsate sample however an error was made on the COC and ammonia and sulfate were also analysed.

The concentrations of ammonia and sulfate in the rinsate sample were low, at least 3 orders of magnitude for sulfate. Due to this, the non-conformance is not considered to affect the reliability of the data as the results within the groundwater samples are higher than that of the rinsate blank.

### **Laboratory Control Samples**

Report EM1917208 (Soil) identified the recovery of the laboratory control sample for fluoranthene to be below the lower control limit. This non-conformance could suggest a slightly lower bias for fluoranthene.

### **Laboratory Duplicate RPDs**

Relative percentage differences between duplicate analyses undertaken for analysis of the secondary laboratory soil sample collected 19 November 2019 exceeded acceptance limits for some TPH/TRH fractions, toluene, ethylbenzene and ortho-xylene. When comparing the secondary laboratory results to those of the primary sample RPDs are within acceptance limits as are those calculated for all laboratory duplicates undertaken by the primary laboratory, therefore the results are considered representative.



### **Matrix Spike Recovery**

The matrix spike recovery was not determined in report EM1917208 (Soil) for TRH and TPH fractions as the background level was greater than or equal to 4 x the spike level. This is not considered to impact on the overall representativeness of the data.

### **Data Suitability**

While a small number of QC results were outside specified acceptance criteria, these were not considered to significantly impact on the quality or representativeness of the data, and majority of results indicated that the precision and accuracy of the data was within acceptable limits. The results are therefore considered to be representative of chemical concentrations in the environmental media sampled at the time of sampling, and to be suitable to be used for their intended purpose in forming conclusions relating to the contamination status of soil and groundwater at the site.



**Table G-2: Field Blank Analytical Results**  
 Baseline Due Diligence Investigation  
 32 - 34 South Wharf, Port Melbourne



		Field ID	FB_201016	FB_211016	QC09	QS01	QS04	QS07	QS08	QS11
		Date	20/10/2016	21/10/2016	9/10/2019	19/11/2019	19/11/2019	9/10/2019	9/10/2019	10/10/2019
		Sample Type	Field_B	Field_B	Rinsate	Trip_B	Rinsate	Trip_B	Rinsate	Rinsate
		Lab Report No.	520784	520784	682320	688915	688915	EM1917008	EM1917008	EM1917008
	Unit	EQL								
<b>Physical Parameters</b>										
Total Dissolved Solids	mg/L	10	-	-	-	-	-	-	-	<10
pH (Lab)	pH Units	0.01	-	-	-	-	-	-	-	5.62
<b>Inorganics</b>										
Ammonia (as N)	mg/L	0.01	-	-	-	-	-	-	-	0.04
<b>Major Ions</b>										
Sulfate (as SO4)	mg/L	5	-	-	<5	-	-	-	-	-
Sulfate (as SO4) (filtered)	mg/L	1	-	-	-	-	-	-	-	6
<b>Metals</b>										
Arsenic	mg/L	0.001	-	-	<0.001	-	<0.001	-	<0.001	<0.001
Cadmium	mg/L	0.0001	-	-	<0.0002	-	<0.0002	-	<0.0001	<0.0001
Chromium	mg/L	0.001	-	-	<0.001	-	<0.001	-	<0.001	<0.001
Copper	mg/L	0.001	-	-	<0.001	-	<0.001	-	<0.001	<0.001
Lead	mg/L	0.001	-	-	<0.001	-	<0.001	-	<0.001	<0.001
Mercury	mg/L	0.0001	-	-	<0.0001	-	<0.0001	-	<0.0001	<0.0001
Nickel	mg/L	0.001	-	-	<0.001	-	<0.001	-	<0.001	<0.001
Zinc	mg/L	0.005	-	-	<0.005	-	<0.005	-	<0.005	<0.005
<b>BTEX</b>										
Benzene	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	µg/L	1	<1	<1	<1	<1	<1	<2	<2	<2
Ethylbenzene	µg/L	1	<1	<1	<1	<1	<1	<2	<2	<2
Xylene (m & p)	µg/L	2	<2	<2	<2	<2	<2	<2	<2	<2
Xylene (o)	µg/L	1	<1	<1	<1	<1	<1	<2	<2	<2
Total Xylene	µg/L	2	<3	<3	<3	<3	<3	<2	<2	<2
Total BTEX	µg/L	1	-	-	-	-	-	<1	<1	<1
<b>Total Petroleum Hydrocarbons</b>										
C6-C9 Fraction	µg/L	20	<20	<20	<20	<20	<20	<20	<20	<20
C10-C14 Fraction	µg/L	50	-	-	<50	-	<50	-	<50	<50
C15-C28 Fraction	µg/L	100	-	-	<100	-	<100	-	<100	<100
C29-C36 Fraction	µg/L	50	-	-	<100	-	<100	-	<50	<50
C10-C36 Fraction (Sum)	µg/L	50	-	-	<100	-	<100	-	<50	<50
<b>Total Recoverable Hydrocarbons</b>										
C6-C10 Fraction	µg/L	20	<20	<20	<20	-	<20	<20	<20	<20
C6-C10 Fraction minus BTEX (F1)	µg/L	20	<20	<20	<20	-	<20	<20	<20	<20
>C10-C16 Fraction	µg/L	50	-	-	<50	-	<50	-	<100	<100
>C10-C16 Fraction minus naphthalene (F2)	µg/L	50	-	-	<50	-	<50	-	<100	<100
>C16-C34 Fraction	µg/L	100	-	-	<100	-	<100	-	<100	<100
>C34-C40 Fraction	µg/L	100	-	-	<100	-	<100	-	<100	<100
>C10-C40 Fraction (Sum)	µg/L	100	-	-	<100	-	<100	-	<100	<100
<b>PAHs</b>										
Acenaphthene	µg/L	1	-	-	<1	-	<1	-	-	-
Acenaphthylene	µg/L	1	-	-	<1	-	<1	-	-	-
Anthracene	µg/L	1	-	-	<1	-	<1	-	-	-
Benz(a)anthracene	µg/L	1	-	-	<1	-	<1	-	-	-
Benzo(a)pyrene	µg/L	1	-	-	<1	-	<1	-	-	-
Benzo(b+ji)fluoranthene	µg/L	1	-	-	<1	-	<1	-	-	-
Benzo(g,h,i)perylene	µg/L	1	-	-	<1	-	<1	-	-	-
Benzo(k)fluoranthene	µg/L	1	-	-	<1	-	<1	-	-	-
Chrysene	µg/L	1	-	-	<1	-	<1	-	-	-
Dibenz(a,h)anthracene	µg/L	1	-	-	<1	-	<1	-	-	-
Fluoranthene	µg/L	1	-	-	<1	-	<1	-	-	-
Fluorene	µg/L	1	-	-	<1	-	<1	-	-	-
Indeno(1,2,3-c,d)pyrene	µg/L	1	-	-	<1	-	<1	-	-	-
Naphthalene	µg/L	1	<10	<10	<1	-	<1	<5	<5	<5
Phenanthrene	µg/L	1	-	-	<1	-	<1	-	-	-
Pyrene	µg/L	1	-	-	<1	-	<1	-	-	-
Sum of Polycyclic aromatic hydrocarbons (PAH)	µg/L	1	-	-	<1	-	<1	-	-	-
<b>MAH</b>										
1,2,4-Trimethylbenzene	mg/L	0.005	-	-	-	-	-	-	<0.005	<0.005
1,3,5-Trimethylbenzene	mg/L	0.005	-	-	-	-	-	-	<0.005	<0.005
Isopropylbenzene	mg/L	0.005	-	-	-	-	-	-	<0.005	<0.005
n-Butylbenzene	mg/L	0.005	-	-	-	-	-	-	<0.005	<0.005
n-Propylbenzene	mg/L	0.005	-	-	-	-	-	-	<0.005	<0.005
p-Isopropyltoluene	mg/L	0.005	-	-	-	-	-	-	<0.005	<0.005
sec-Butylbenzene	mg/L	0.005	-	-	-	-	-	-	<0.005	<0.005
tert-Butylbenzene	mg/L	0.005	-	-	-	-	-	-	<0.005	<0.005
Styrene	mg/L	0.005	-	-	-	-	-	-	<0.005	<0.005
<b>Halogenated Benzenes</b>										
1,2,3-Trichlorobenzene	µg/L	5	-	-	-	-	-	-	<5	<5
1,2-Dichlorobenzene	µg/L	5	-	-	-	-	-	-	<5	<5
1,2,4-Trichlorobenzene	µg/L	5	-	-	-	-	-	-	<5	<5
1,3-Dichlorobenzene	µg/L	5	-	-	-	-	-	-	<5	<5
2-Chlorotoluene	µg/L	5	-	-	-	-	-	-	<5	<5
1,4-Dichlorobenzene	µg/L	5	-	-	-	-	-	-	<5	<5
4-Chlorotoluene	µg/L	5	-	-	-	-	-	-	<5	<5
Bromobenzene	µg/L	5	-	-	-	-	-	-	<5	<5
Chlorobenzene	µg/L	5	-	-	-	-	-	-	<5	<5
<b>Halogenated Hydrocarbons</b>										
1,2-Dibromoethane	µg/L	5	-	-	-	-	-	-	<5	<5
Bromomethane	µg/L	50	-	-	-	-	-	-	<50	<50
Dichlorodifluoromethane	µg/L	50	-	-	-	-	-	-	<50	<50
Iodomethane	µg/L	5	-	-	-	-	-	-	<5	<5
Trichlorofluoromethane	µg/L	50	-	-	-	-	-	-	<50	<50
<b>Chlorinated Hydrocarbons</b>										
1,1-Dichloropropene	µg/L	5	-	-	-	-	-	-	<5	<5
1,1-Dichloroethane	µg/L	5	-	-	-	-	-	-	<5	<5
1,1-Dichloroethene	µg/L	5	-	-	-	-	-	-	<5	<5
1,1,1,2-Tetrachloroethane	µg/L	5	-	-	-	-	-	-	<5	<5
1,1,1-Trichloroethane	µg/L	5	-	-	-	-	-	-	<5	<5
1,2-Dibromo-3-chloropropane	µg/L	5	-	-	-	-	-	-	<5	<5
1,1,2-Trichloroethane	µg/L	5	-	-	-	-	-	-	<5	<5
1,1,2,2-Tetrachloroethane	µg/L	5	-	-	-	-	-	-	<5	<5
1,2,3-Trichloropropane	µg/L	5	-	-	-	-	-	-	<5	<5
1,2-Dichloroethane	µg/L	5	-	-	-	-	-	-	<5	<5
1,3-Dichloropropane	µg/L	5	-	-	-	-	-	-	<5	<5
1,2-Dichloropropane	µg/L	5	-	-	-	-	-	-	<5	<5
2,2-Dichloropropane	µg/L	5	-	-	-	-	-	-	<5	<5
Bromodichloromethane	µg/L	5	-	-	-	-	-	-	<5	<5
Bromoform	µg/L	5	-	-	-	-	-	-	<5	<5
Carbon Tetrachloride	µg/L	5	-	-	-	-	-	-	<5	<5
Chlorodibromomethane	µg/L	5	-	-	-	-	-	-	<5	<5
Chloroethane	µg/L	50	-	-	-	-	-	-	<50	<50
Chloroform	µg/L	5	-	-	-	-	-	-	<5	<5
Chloromethane	µg/L	50	-	-	-	-	-	-	<50	<50
cis-1,4-Dichloro-2-butene	µg/L	5	-	-	-	-	-	-	<5	<5
cis-1,2-Dichloroethene	µg/L	5	-	-	-	-	-	-	<5	<5
Dibromomethane	µg/L	5	-	-	-	-	-	-	<5	<5
cis-1,3-Dichloropropene	µg/L	5	-	-	-	-	-	-	<5	<5
Hexachlorobutadiene	µg/L	5	-	-	-	-	-	-	<5	<5
Pentachloroethane	µg/L	5	-	-	-	-	-	-	<5	<5
Tetrachloroethene	µg/L	5	-	-	-	-	-	-	<5	<5
trans-1,4-Dichloro-2-butene	µg/L	5	-	-	-	-	-	-	<5	<5
trans-1,2-Dichloroethene	µg/L	5	-	-	-	-	-	-	<5	<5
trans-1,3-Dichloropropene	µg/L	5	-	-	-	-	-	-	<5	<5
Trichloroethene	µg/L	5	-	-	-	-	-	-	<5	<5
Vinyl Chloride	µg/L	50	-	-	-	-	-	-	<50	<50
<b>Solvents</b>										
Methyl Ethyl Ketone (MEK)	µg/L	50	-	-	-	-	-	-	<50	<50
2-Hexanone (MBK)	µg/L	50	-	-	-	-	-	-	<50	<50
4-Methyl-2-pentanone	µg/L	50	-	-	-	-	-	-	<50	<50
Carbon disulfide	µg/L	5	-	-	-	-	-	-	<5	<5
Vinyl acetate	µg/L	50	-	-	-	-	-	-	<50	<50

**Table G-3: Field Duplicate RPD Results**  
 Baseline Due Diligence Investigation  
 32 - 34 South Wharf, Port Melbourne



	Unit	Location Code		RPD	SB05		RPD	SB7384		RPD	SB7384		RPD	
		SB05	SB05		SB7384	SB7384		SB7384	SB7384					
		Field ID	QC05		SB7384_0.1-0.2	QS02		SB7384_0.1-0.2	QS03					
		Date	9/10/2019		9/10/2019	19/11/2019		19/11/2019	19/11/2019		19/11/2019			
Sample Type	Normal	Field_D	Normal	Interlab_D	Normal	Interlab_D								
Lab Report No.	682320	682320	682320	EM1917208	688915	688915								
<b>Physical Parameters</b>		EQL												
Moisture Content	%	1	10.0	10	0	10.0	9.6	4	22	21	5	22	20.9	5
pH (aqueous extract)	pH Units	0.1	9.6	9.6	0	9.6	8.2	16	8.5	8.7	2	8.5	-	-
<b>Major Ions</b>														
Sulfate (as SO4)	mg/kg	30	<30	<30	0	<30	<50	0	<30	<30	0	<30	-	-
<b>Metals</b>														
Arsenic	mg/kg	2	<2	<2	0	<2	<5	0	9.6	20	70	9.6	10	4
Cadmium	mg/kg	0.4	<0.4	<0.4	0	<0.4	<1	0	0.7	0.5	33	0.7	<1	0
Chromium	mg/kg	2	7.3	<5	37	7.3	2	114	26	39	40	26	21	21
Copper	mg/kg	5	7.5	5.5	31	7.5	<5	40	86	70	21	86	94	9
Lead	mg/kg	5	<5	<5	0	<5	<5	0	46	55	18	46	42	9
Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	0.1	0.1	0	0.1	0.2	67
Nickel	mg/kg	2	23	14	49	23	10	79	39	33	17	39	31	23
Zinc	mg/kg	5	17	10	52	17	7	83	200	300	40	200	169	17
<b>BTEX</b>														
Benzene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.2	0	<0.1	<0.1	0	<0.1	<0.2	0
Toluene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0
Ethylbenzene	mg/kg	0.1	<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	<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	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0
Total Xylene	mg/kg	0.3	<0.3	<0.3	0	<0.3	<0.5	0	<0.3	<0.3	0	<0.3	<0.5	0
Total BTEX	mg/kg	0.2	-	-	-	-	<0.2	-	-	-	-	-	<0.2	-
<b>Total Petroleum Hydrocarbons</b>														
C6-C9 Fraction	mg/kg	10	<20	<20	0	<20	<10	0	<20	<20	0	<20	<10	0
C10-C14 Fraction	mg/kg	20	<20	<20	0	<20	<50	0	<20	<20	0	<20	<50	0
C15-C28 Fraction	mg/kg	50	<50	<50	0	<50	<100	0	620	<50	170	620	400	43
C29-C36 Fraction	mg/kg	50	74	<50	39	74	<100	0	640	<50	171	640	280	78
C10-C36 Fraction (Sum)	mg/kg	50	74	<50	39	74	<50	39	1,260	<50	185	1,260	680	60
<b>Total Recoverable Hydrocarbons</b>														
C6-C10 Fraction	mg/kg	10	<20	<20	0	<20	<10	0	<20	<20	0	<20	<10	0
C6-C10 Fraction minus BTEX (F1)	mg/kg	10	<20	<20	0	<20	<10	0	<20	<20	0	<20	<10	0
>C10-C16 Fraction	mg/kg	50	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0
>C10-C16 Fraction minus naphthalene (F2)	mg/kg	50	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0
>C16-C34 Fraction	mg/kg	100	<100	<100	0	<100	<100	0	1,100	<100	167	1,100	600	59
>C34-C40 Fraction	mg/kg	100	130	<100	26	130	<100	26	310	<100	102	310	140	76
>C10-C40 Fraction (Sum)	mg/kg	50	130	<100	26	130	<50	89	1,410	<100	174	1,410	740	62
<b>PAHs</b>														
Acenaphthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Acenaphthylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(a)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	5.9	<0.5	169	5.9	1.7	111
Benzo(a)pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	15	<0.5	187	15	2.6	141
Benzo(b+)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	6.3	<0.5	171	6.3	3.0	71
Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	4.2	<0.5	157	4.2	1.0	123
Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	6.9	<0.5	173	6.9	1.1	145
Chrysene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	11	<0.5	183	11	1.7	146
Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	1.0	<0.5	67	1.0	<0.5	67
Fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	15	<0.5	187	15	2.0	153
Fluorene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	3.4	<0.5	149	3.4	0.9	116
Naphthalene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Phenanthrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	0.8	<0.5	46	0.8	<0.5	46
Pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	18	<0.5	189	18	2.6	150
Benzo(a)pyrene TEQ (Zero)	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	18	<0.5	189	18	3.3	138
Sum of Polycyclic aromatic hydrocarbons (PAH)	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	87.5	<0.5	198	87.5	16.6	136

\*RPDs have only been considered where a concentration is greater than 1 times the EQL.  
 \*\*Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 1000 (1 - 10 x EQL); 50 (10 - 20 x EQL); 30 (> 20 x EQL) )  
 \*\*\*Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory



## Appendix H: Assessment Criteria



## Appendix H: Assessment Guidelines and Regulatory Framework

The following sections outline the regulatory framework under which contamination of land and groundwater is assessed and managed in Victoria. Relevant objectives and/or investigation levels have been adopted for initial assessment of whether pollution is present at the site.

The following sections outline the regulatory framework under which contamination of land and groundwater is assessed and managed in Victoria, and specify relevant objectives and/or investigation levels which have been adopted for initial assessment of whether pollution is present at the site.

### 1.1 Soil

#### 1.1.1 Regulatory Framework

The *State Environment Protection Policy (Prevention and Management of Contamination of Land) 2002* (SEPP (PMCL)) sets out the regulatory framework for the prevention and management of contaminated land within the State of Victoria. The intent of this framework is to maintain and maximise, to the extent practicable, the quality of the land environment in Victoria, in order to protect its existing and potential beneficial uses. The SEPP (PMCL) was declared in June 2002 in accordance with Section 16 of the *Environment Protection Act, 1970*, and EPA Victoria is responsible for its implementation.

The SEPP (PMCL) identifies a range of land use categories and relevant protected beneficial uses for each of these categories, as well as indicators (chemical or other characteristics) and objectives for these indicators to determine whether the level of an indicator may pose an unacceptable risk to (i.e. precludes) protected beneficial uses. A state of pollution exists where the concentration of a physical, chemical, biological or radiological characteristic (indicator) does not meet the relevant soil quality objective for that indicator and therefore precludes a protected beneficial use for a relevant land use category.

- The protected beneficial uses of land at the site, and the soil quality objectives specified in the SEPP (PMCL) for each protected beneficial use of land, are discussed in the following sections.

#### 1.1.2 Protected Beneficial Uses of Land

In accordance with the SEPP (PMCL) the protected beneficial uses of land used for a commercial/industrial purpose are the following:

- Maintenance of highly modified ecosystems.
- Human health.
- Buildings and structures.
- Aesthetics (commercial use only).

#### 1.1.3 Soil Investigation and Screening Levels

Soil quality objectives (also commonly referred to as investigation levels) for the protected beneficial uses of land were adopted in accordance with Table 2 of the SEPP (PMCL), and are detailed in the following table.




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**Beneficial Use      Adopted Soil Quality Objectives / Investigation Levels**


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**Maintenance of Ecosystems (Highly Modified)**

The SEPP (PMCL) states that the level of a chemical substance or waste (indicator) must not be greater than any regional Ecological Investigation Level (EIL) developed in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure* ('the NEPM'; NEPC, 2013), or until such time that a regional EIL applicable to the site is published, the Interim Urban EILs nominated in the NEPM.

The current version of the NEPM (NEPC, 2013) specifies the following ecologically based investigation and/or screening levels:

- Default EILs for arsenic, lead, DDT and naphthalene.
- A methodology for derivation of site-specific EILs for nickel, chromium III, copper and zinc. The derivation process requires determination of ambient background concentrations (ABC) and added contaminant limits (ACLs) for these chemicals, and the EIL is then calculated as the ABC plus the ACL.
- Ecological screening levels (ESLs) for BTEX, benzo(a)pyrene and petroleum hydrocarbon fractions.

The EILs and ESLs have been developed for three generic land use settings, based on a range of species protection levels:

- Areas of ecological significance (99% species protection).
- Urban residential and public open space (80% species protection).
- Commercial and industrial (60% species protection).

Based on the current and foreseeable future land use(s) at the site, EILs/ESLs for commercial and industrial land have been adopted.

For initial screening purposes, EILs for nickel, chromium III, copper and zinc have been derived for aged soils based on adoption of conservative screening assumptions regarding soil properties, as follows:

- EILs were calculated as the sum of the ABC and the ACL.
  - ABCs were assumed to be the default (most conservative) values for aged soils with low traffic.
  - ACLs were assumed to be the minimum (most conservative) values specified in Table 1B(1) to 1B(4) within NEPC (2013) Schedule B1.
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**Human Health**

The SEPP (PMCL) states that the level of a chemical substance or waste must not be greater than the investigation level specified for human health in the NEPM.

Schedule B(1) of the current version of the NEPM (NEPC, 2013) provides a range of investigation levels for the protection of human health, referred to as Health-based Investigation Levels (HILs), and provides Health Screening Levels (HSLs) for BTEX and petroleum hydrocarbons. HILs and HSLs are provided for four generic land use settings as follows:

- HIL/HSL A – Residential with garden/accessible soil (home-grown produce contributing less than 10% of vegetable and fruit intake; no poultry). This category also includes children's day-care centres, kindergartens, preschools and primary schools.
- HIL/HSL B – Residential with minimal opportunities for soil access. Includes dwellings with fully and permanently paved yard space such as high-rise apartments and flats.
- HIL/HSL C – Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. It does not include undeveloped public open space (such as urban bushland and reserves) which should be subject to a site-specific assessment where appropriate.
- HIL/HSL D – Commercial/industrial such as shops, offices, factories and industrial sites.

It is emphasised within the NEPM that HILs are not intended for use as default remediation trigger criteria but are intended to prompt an appropriate site-specific assessment of risk when they are exceeded. This is consistent with Table 2 of the SEPP (PMCL), which allows for objectives derived using a risk-based methodology to be adopted in place of HILs.

Based on the current and foreseeable future use of the site, NEPM HIL/HSL D values are the most appropriate guideline values.

For chemicals for which HILs or HSLs are not specified in the NEPM, Regional Screening Levels (RSLs) published by the USEPA (USEPA, 2018) have been adopted. The release date of the screening levels adopted is dated May 2018. 'Industrial' values have been adopted for assessment of commercial and/or industrial land uses (Setting D).

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**Beneficial Use      Adopted Soil Quality Objectives / Investigation Levels**


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With respect to the use of HSLs, the following is noted:

- The HSLs in the NEPM (for TRH, BTEX and naphthalene) were derived with consideration of potential vapour exposure, and consider a range of soil types and contamination depths. Friebel and Nadebaum (2011), who derived the HSLs currently adopted in the NEPM, also derived values for direct contact exposure, however these were not published in the NEPM. The HSL values adopted for this assessment were the lowest of those derived for vapour intrusion (published in the NEPM) or direct contact pathways (published by Friebel and Nadebaum, 2011) for the relevant land use(s). Where relevant, the most conservative of the vapour-based values (those derived for sand lithology and with contamination at depths of 0 to <1 m depth) were adopted.
- The HSLs for BTEX and naphthalene (which are not saturation or solubility limited) are considered appropriate for use at sites where the source of contamination includes petroleum and/or non-petroleum based activities (e.g. gas manufacture). However, the HSLs for TRH fractions have been derived for typical petroleum mixtures (petrol and diesel) and are not appropriate for assessment of non-petroleum contamination. Based on the source of TRH at the site, application of the TRH HSLs to the site is considered appropriate.

It is noted that the HSLs have been derived with consideration to potential vapour inhalation health risks, however the NEPC (2013) HILs and the USEPA (2018) RSLs have not. Therefore, where volatile contaminants are reported to be present in soils above laboratory detection limits, consideration of potential vapour intrusion risks may be warranted even where reported concentrations are below the adopted investigation levels, if the adopted investigation levels were sourced from NEPC (2013) or USEPA (2018).

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**Buildings and Structures**

The SEPP (PMCL) states "*Contamination must not cause the land to be corrosive to or adversely affect the integrity of structures or building materials*".

Relevant indicators are stated by the SEPP (PMCL) to be "*pH, sulfate, redox potential, salinity or any chemical substance or waste that may have a detrimental impact on the structural integrity of buildings or other structures.*"

Objectives for these key indicators have primarily been sourced from Australian Standard 2159–2009 *Piling Design and Installation*, in which levels of pH, chloride and sulfate which are considered to represent mild and/or non-aggressive conditions for concrete or steel piles are specified. The values adopted for initial screening (<5,000 mg/kg sulfate, pH >5 and <5,000 mg/kg chloride) are the most conservative of those reported in AS2159 for concrete and steel piles, and are considered to be associated with mild or non-aggressive conditions only where all objectives are met. Where one or more objective is not met, conditions may still be acceptable, but exposure conditions should be further evaluated in accordance with Tables 6.4.2(C) and 6.5.2(C) within AS2159.

The potential for organic compounds (e.g. solvents or petroleum hydrocarbons) to corrode or adversely impact (e.g. permeate) non-metal underground services should also be considered, particularly where saturated concentrations or free phase product are in contact with buildings and/or structures.

The assessment of soil for protection of buildings and structures is considered beyond the scope of this investigation.

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**Aesthetics**

The SEPP (PMCL) states, "Contamination must not cause the land to be offensive to the senses of human beings."

In an industrial setting, aesthetics is not a protected beneficial use so has not been assessed as part of this investigation.

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## 1.2 Groundwater

### 1.2.1 Regulatory Framework

The State Environment Protection Policy (Waters) (SEPP Waters; State of Victoria, 2018) sets out the framework to protect and improve the quality of Victoria's waters (including groundwater), having regard to the principles of environment protection set out in the *Environment Protection Act 1970* (the Act).

The SEPP Waters defines a range of protected beneficial uses for defined segments of the groundwater environment, based on groundwater salinity (as TDS). The SEPP Waters also specifies indicators (chemical or other characteristics) and objectives to determine whether the level of an indicator may pose an unacceptable risk (i.e. potentially precludes) protected beneficial uses. Groundwater is considered polluted where one or more of the following situations exists:

- The groundwater quality objectives for any protected beneficial use are exceeded. Where groundwater quality objectives are exceeded by natural levels, the natural background levels become the objective.
- There is otherwise a detriment to a beneficial use (e.g. the presence of odours in water used for irrigation or recreation use).
- Non-aqueous phase liquid (NAPL) is present. All beneficial uses of groundwater are considered precluded where NAPL is present with the exception of Buildings and Structures which is considered precluded only when in contact with groundwater.

### 1.2.2 Relevant Groundwater Segment

A review of laboratory analysis and field data from the site was undertaken to assess the groundwater segment at the site. The review indicated that:

- The field measured TDS concentrations ranged from 867 mg/L (MW7016) to 16,137 mg/L (MW7018). The average and median TDS concentration measured from this investigation was 4,594 mg/L and 2,488 mg/L respectively.

Taking into consideration the above information and historical averages, the shallow groundwater is considered conservatively to be Segment C (as defined in the SEPP Waters).

### 1.2.3 Protected Beneficial Uses of Groundwater

The SEPP Waters requires that Segment C groundwater is protected for the following beneficial uses:

- Water dependent ecosystems and species.
- Potable mineral water supply.
- Agriculture and irrigation (stock watering).
- Industrial and commercial.
- Water based recreation (primary contact recreation).
- Traditional owners' cultural values.
- Cultural and spiritual values.
- Buildings and structures.
- Geothermal properties.



### 1.2.4 Groundwater Quality Objectives

Groundwater quality objectives (also commonly referred to as investigation levels) for the protected beneficial uses of groundwater were adopted in accordance with Table 2 of the SEPP Waters, and are detailed in the following table:

Beneficial Use	Adopted Groundwater Quality Objectives / Investigation Levels
<b>Water Dependent Ecosystems and Species</b>	<p>The SEPP Waters states that “groundwater must not cause receiving waters to be affected to the extent that the level of any environmental quality indicator is greater than the level...specified for surface waters in this Policy” and “groundwater quality must not adversely affect the maintenance of environmental values that depend on groundwater.” Therefore, the beneficial uses of surface waters and environmental quality indicators and objectives as set out in Schedules 2 and 3 of SEPP Waters apply. The beneficial uses and objectives specified in the SEPP Waters depend on the receiving surface water body and apply at the zone of discharge</p> <p>Based on the inferred groundwater flow direction and identified surface water receptors in the vicinity of the site, the Yarra River located immediately adjacent north of the site (approximately 30 – 50 m) is considered likely to be the nearest major surface water body which would receive groundwater migrating from the site. The discharge area from the site along the Yarra River is likely to be tidally influenced with substantial variation in salinity due to mixing of marine and fresh waters. The waters of the Yarra River fall within the Hobsons Bay Marine and Estuarine subsegment of Port Phillip Bay and is defined in SEPP Waters and as a “slightly to moderately modified” ecosystem.</p> <p>Water quality objectives for the Hobsons Bay subsegment are specified in Section 1 of Schedule 3 of the SEPP Waters to be those listed in the <i>Australian Water Quality Guidelines for Fresh and Marine Waters</i> (ANZECC/ARMCANZ<sup>1</sup>, 2000), unless alternative objectives are listed in Table 1 of Schedule 3. Table 1 of Schedule 3 specifies the following:</p> <ul style="list-style-type: none"> <li>Objectives for toxicants are those for the protection of aquatic ecosystems as listed in ANZECC/ARMCANZ (2000). As the Hobsons Bay subsegment is defined within Schedule 2 as a “slightly to moderately modified”, the 95% protection levels set out in ANZECC/ARMCANZ (2000) are considered to apply (as per clause 1(6)(b) of Schedule 3 to SEPP Waters). For toxicants which are bioaccumulative the next highest level of protection has been adopted in accordance with clause 1(6)(b)(iv) of Schedule 3. Where high and/or moderate reliability trigger values for a chemical are not published, Senversa has adopted low reliability trigger values (where available) as an indicative interim working level, in accordance with ANZECC/ARMCANZ (2000).</li> <li>Objectives for water quality parameters (pH, electrical conductivity, dissolved oxygen, turbidity) and some nutrients (total phosphorus and total nitrogen) are listed and have been adopted as indicative screening levels where these parameters are considered to have been impacted by site contamination. However, Senversa notes that these objectives may not be achievable in natural aquifer systems prior to discharge even in the absence of contamination, due to natural geochemical and biochemical conditions with the aquifer.</li> </ul>
<b>Potable Mineral Water Supply</b>	<p>This beneficial use is not considered relevant at the site as groundwater does not have mineral water characteristics (e.g. carbon dioxide and other soluble matter in sufficient concentration to cause effervescence) as defined in SEPP Waters. As such this beneficial use is not considered further.</p>
<b>Agriculture and Irrigation (Stock Watering)</b>	<p>For agriculture and irrigation (stock watering), the SEPP Waters specifies indicators and objectives from ANZECC/ARMCANZ (2000) i.e. those for <i>Livestock Drinking Water Quality</i> within Section 4.3 of the guidelines.</p> <p>For contaminants for which no livestock drinking water quality criteria are provided, drinking water guidelines for human health have been adopted. Current drinking water guidelines to supplement the above values were adopted from the following sources (in order of preference):</p> <ul style="list-style-type: none"> <li>NHMRC (2011), <i>Australian Drinking Water Guidelines - Health</i></li> <li>WHO (2011), <i>Guidelines for Drinking Water Quality</i> (and associated rolling revisions)</li> <li>USEPA . <i>Regional Screening Levels - Tap Water</i> (<a href="https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables">https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables</a>).</li> </ul>

<sup>1</sup> Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resources Management Council of Australia and New Zealand (ARMCANZ).




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**Beneficial Use**
**Adopted Groundwater Quality Objectives / Investigation Levels**


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Based on the variable groundwater salinity and port land use, the likelihood of this beneficial use being realised on or in the vicinity of the site is considered to be low and has not been considered further.

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**Industrial and Commercial**

The SEPP Waters states that “*groundwater must not be affected to the extent that industrial or commercial water quality is impacted.*”

No generic investigation levels or thresholds for industrial and commercial water quality are provided in ANZECC/ARMCANZ (2000). However, where an existing, proposed or likely industrial or commercial use may occur on or in the vicinity of the site, the potential for contamination to preclude this beneficial use was further considered. SEPP Waters states that consideration must be given to Section 2.2.4 of ANZECC/ARMCANZ (2000) for guidance on deriving guidelines for compounds where no guidelines currently exist.

Based on the variable groundwater salinity and port land use, the likelihood of this beneficial use being realised on or in the vicinity of the site is considered to be low and has not been considered further.

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**Water Based Recreation  
(Primary Contact  
Recreation)**

For primary contact recreation, the SEPP Waters specifies indicators and objectives from NHMRC (2008) *Guidelines for Managing Risks in Recreational Water*.

Drinking water guidelines were recommended by the above source in order to protect swimmers from harmful effects through ingestion. NHMRC (2008) specifies that higher concentrations of toxicants may be acceptable for water used for recreational purposes as a person is considered to ingest a maximum of 200 mL water during recreational exposure, compared to an ingestion rate of 2 litres per day assumed in the derivation of drinking water guidelines. However, this document also notes that special care must be taken for substances that can enter the body through skin absorption and/or inhalation during recreational use.

In keeping with the principles of the above guidance document, Senversa has adopted the current drinking water guidelines as objectives for protection of the primary contact recreation beneficial use. Drinking water objectives were sourced from Australian or international sources in the following order of preference:

- NHMRC (2011), Australian Drinking Water Guidelines - Health and/or Aesthetic (lower of health or aesthetic guideline adopted where applicable).
- WHO (2011), Guidelines for Drinking Water Quality (and associated rolling revisions)
- USEPA. Regional Screening Levels - Tap Water (<https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables>).

Where the above objectives adopted for initial screening are exceeded, consideration should be given to whether an adjustment of the drinking water guideline is appropriate (as per NHMRC, 2008).

For microbiological parameters, SEPP Waters states:

- Microbial water quality must not be affected to the extent that the environmental quality indicator of E. coli is greater than 10 E. coli/100 mL.
- When human faecal contamination sources have been identified, no E. coli must be present.

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**Traditional Owners’  
Cultural Values & Cultural  
and Spiritual Values**

No environmental quality objectives for traditional owners’ cultural values and for cultural and spiritual values have been specified in SEPP Waters, therefore the objectives for water dependent ecosystems and species and water based recreation have been adopted as default objectives on the assumption that if these objectives are achieved, then the beneficial use of traditional owners’ cultural values will also be protected. In circumstances where these objectives were not attained, clause 17(4) identifies that *if the level of any environmental quality indicator or objective is not provided for in Schedule 3, contamination must not cause an adverse impact on the beneficial uses.*

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Beneficial Use	Adopted Groundwater Quality Objectives / Investigation Levels
<b>Buildings and Structures</b>	<p>The SEPP Waters states “<i>introduced contaminants must not cause groundwater to become corrosive to structures or building materials</i>” therefore naturally elevated indicators were not considered.</p> <p>Relevant indicators are stated by the SEPP Waters to be pH, sulphate, chloride, redox potential, salinity or any chemical substance which may have a detrimental impact on the structural integrity of buildings or other structures.</p> <p>Objectives for these indicators have primarily been sourced from Australian Standard 2159-2009 (<i>Piling – Design and Installation</i>), in which levels of pH, chloride and sulphate considered to represent mild and/or non-aggressive conditions for concrete or steel piles are specified. The objectives adopted for initial screening (&lt;1,000 mg/L sulphate, pH &gt;5 and &lt;1,000 mg/L chloride) are the most conservative of those reported in AS2159 for concrete and steel piles and are considered to be associated with mild or non-aggressive conditions only where all objectives are met. Where one or more objective is not met, conditions may still be acceptable, but exposure conditions should be further evaluated in accordance with Tables 6.4.2(C) and 6.5.2(C) within AS2159.</p> <p>In addition, particularly reducing or oxidising conditions (as indicated by field-measured redox potential) need to be considered where shallow groundwater is present.</p> <p>Based on the depth to groundwater and the nature of the development at the site, it is considered possible that building foundations and/or other infrastructure (e.g. service conduits) will come into direct contact with groundwater.</p>
<b>Geothermal Properties</b>	<p>The SEPP Waters states “<i>no activity must affect the geothermal properties of groundwater</i>”. Indicators that natural groundwater geothermal properties need protection “<i>include temperature between 30 and 70 degrees Celsius</i>”.</p> <p>The measured temperature of groundwater at and the vicinity of the site ranges from 18.8 to 22.4 C, indicating that geothermal use is not protected in groundwater at the site. As such this beneficial use is not considered further.</p>
<b>Navigation and Shipping</b>	<p>The SEPP Waters includes Navigation and Shipping as a protected beneficial use for the surface waters of Swanson and Appleton Dock. Appleton Dock is located approximately 100 m south of the site, downgradient of the inferred direction of groundwater flow. The SEPP Waters requires “<i>water quality that is suitable for shipping transport and harbour facilities</i>”. No environmental quality objectives have been specified in SEPP Waters for this protected beneficial use. Given the intertidal exchange and mixing zones, the potential for groundwater quality to impact this beneficial use is considered negligible and therefore is not considered further.</p>

A groundwater quality objective for TPH is not available from the above references. Petroleum hydrocarbon mixtures are typically made up of numerous individual hydrocarbons with varying physical, environmental and toxicological properties. Senversa has adopted an investigation value of 0.6 mg/L developed by the Netherlands Ministry of Housing, Spatial Planning and the Environment Intervention Values for “mineral oil” (VROM 2013) as an indicator of the presence of petroleum hydrocarbons. However, where TPH is detectable, the specific chemical constituents contributing to the analytical result should be assessed individually. If the specific chemical constituents contributing to detectable TPH concentrations have not been identified based on the chemical analyses undertaken, the nature and source of hydrocarbons present at the site should be further investigated.



tel: + 61 3 9606 0070

fax: + 61 3 9606 0074

enquiries@senversa.com.au

[www.senversa.com.au](http://www.senversa.com.au)

Level 6, 15 William Street, Melbourne, VIC 3000

Senversa Pty Ltd ABN 89 132 231 380

