Australia Pacific Airports (Melbourne) Pty Ltd

T4 Express Elevated Road

Major Development Plan (MDP)

Rev A

Final | 22 October 2019

Job number 262091-00

Arup
Arup Pty Ltd ABN 18 000 966 165

Arup
Sky Park, One Melbourne Quarter
699 Collins Street
Docklands VIC 3008
Australia
www.arup.com

ARUP

Contents

			Page
Executive Summary			**iv**
1	**Introduction**		**1**
	1.1	Introduction	1
	1.2	Project Summary	1
	1.3	Major Airport Development Approvals	1
	1.4	Report Structure	2
	1.5	Project Proponent	3
2	**Project Description**		**4**
	2.1	The Project	4
	2.2	Project Justification and Objectives	8
	2.3	Location of the Project	10
	2.4	Airport and Regional Growth	10
	2.5	Existing Traffic Volumes and Future Demand	11
	2.6	Construction	11
3	**Legislative Context**		**12**
	3.1	Introduction	12
	3.2	Statutory and Policy Compliance	12
	3.3	Consistency with Airport Lease	14
	3.4	Legal Compliance	15
	3.5	Consistency with the Melbourne Airport Master Plan and Environmental Strategy	15
	3.6	Consistency with State and Local Government Planning	16
	3.7	Airport Development and Building Approvals	18
4	**Assessment Methodology**		**19**
	4.1	Assessment Scope	19
	4.2	Document Review	19
	4.3	Site inspection	20
	4.4	Assessment of impacts	20
5	**Impact Assessment**		**22**
	5.1	Traffic	22
	5.2	Soils and Land and Groundwater Contamination	26
	5.3	Surface water and drainage	30
	5.4	Ecology	32
	5.5	Air Quality	35
	5.6	Noise	41

	5.7	Land Use and Tenure	43
	5.8	Economic and Social	52
	5.9	Landscape and Visual	55
	5.10	Cultural Heritage	58
	5.11	Hazardous Goods	61
	5.12	Aviation Operations and Safety	62
6	**Summary of Impacts**		**66**
7	**Environmental Management**		**67**
	7.1	Environmental Policy	67
	7.2	Environmental Strategy	67
	7.3	Environmental Management Procedures	68
8	**Consultation and Approval Process**		**69**
	8.1	Consultation Objectives	69
	8.2	Consultation Strategy	69
9	**References**		**72**

Appendices

Appendix A

Airports Act MDP Checklist

Appendix B

Detailed Design Drawings

Appendix C

Preliminary Soil Contamination Assessment

Glossary and Abbreviations

APAM	Australia Pacific Airports (Melbourne) Pty Ltd – the airport lessee company at Melbourne Airport
CEMP	Construction Environmental Management Plan
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EVC	Ecological Vegetation Classes
MDP	Major Development Plan
VAHR	Victorian Aboriginal Heritage Register
NTGVVP	Natural Temperate Grassland of the Victorian Volcanic Plain
CHMP	Cultural Heritage Management Plan
Airports Act	*Airports Act 1996*
ASA	Air Services Australia
DIRDC	Department of Infrastructure, Regional Development and Cities (fmr)
DITCRD	Department of Infrastructure, Transport, Cities and Regional Development
NES	National Environmental Significance
ABC	Airport Building Controller
AHD	Australian Height Datum
OLS	Obstacle Limitation Surfaces
ALC	Airport-lessee Company
PANS-OPS	Procedures for Air Navigation Services – Aircraft Operations Surface
T4	Terminal 4
SMP	Soil Management Plan

Executive Summary

Melbourne Airport is operated by Australia Pacific Airports (Melbourne) (APAM) Pty Ltd under a long-term lease from the Commonwealth Government. As travel demands at Melbourne Airport are expected to increase significantly to 2038, APAM is proposing to invest in its landside road network to improve passenger vehicle circulation and access to Melbourne Airport. The T4 Express Link represents the first step in this process.

The T4 Express Link is a new elevated road, directly linking the Tullamarine Freeway and T4 Ground Transport Hub. Vehicles accessing the airport will exit the Tullamarine Freeway onto a purpose-built off-ramp, approximately 500 metres north of the Mercer Drive exit. At grade, this three-lane roadway will skirt the existing long-term car park, before passing beneath the existing APAC Drive freeway onramp. From here the road will rise over the existing long-term car park, where it will connect with the existing elevated road.

It is expected the Project will deliver users of T4 a time saving of 30% when accessing the terminal. In addition, the Project will remove 5,000 cars per day from Airport Drive, benefiting commercial and freight vehicles and users on Mercer Drive.

Under Section 89 of the *Airports Act 1996*, the T4 Express Link is a major airport development. Under Section 90 of the Act, a major airport development requires the preparation of a Major Development Plan which requires approval from the Commonwealth Minister for Infrastructure, Transport and Regional Development.

In accordance with Section 91 of the Airports Act, an environmental assessment has been undertaken in preparation of this MDP. This assessment considers a range of factors including traffic, soil and land contamination and ecology. A summary of the potential environmental impacts considered in the assessment are shown below.

Section	Environmental and social factors	Impacts	
		Construction	Operation
5.1	Traffic	Low	Low beneficial
5.2	Soils and Land Contamination	Low	Negligible
	Groundwater Contamination	Negligible	Negligible
5.3	Surface Water and Drainage	Low	Low
5.4	Ecology	Negligible	Negligible
5.5	Air Quality	Low	Low
5.6	Noise	Low	Low
5.7	Land Use	Low	Low beneficial
	Tenure	Moderate	Low
5.8	Economic and Social	Low	Low beneficial
5.9	Landscape	Low	Low
5.10	Cultural Heritage	Negligible	Negligible

Section	Environmental and social factors	Impacts	
		Construction	Operation
5.11	Hazardous Goods	Low	Negligible
5.12	Aviation Operations and Safety	Negligible	Negligible

Overall the T4 Express Link is considered to have a low impact on the environment during construction and operation. The benefits the Project will ultimately deliver to the access to Melbourne Airport will far outweigh the potential impacts outlined in this assessment. Any environmental risk associated with the project will be mitigated through an appropriate Construction Environment Management Plan, addressing relevant criteria. This will be prepared by the project contractor, prior to commencing construction.

Melbourne Airport has a commitment to proactive community consultation underpinned by a desire for Melbourne Airport to be positioned within the community as a responsible corporate citizen and meeting the requirements under the Airports Act for community consultation. Both statutory and non-statutory consultation strategies have been developed, of which the public display of this MDP is a component.

APAM has consulted with VicRoads in the preparation of this Preliminary Draft MDP through a series of meetings since June 2018. As part of the Exposure Draft process, the following stakeholders have been engaged with:

- Transport for Victoria (Vic) (encompassing Rail Projects Victoria and Freight Victoria);
- Department of Environment, Land, Water and Planning (Vic);
- CASA;
- Air Services Australia;
- Department of Environment and Energy (Cth); and
- Department of Infrastructure, Transport, Cities and Regional Development (previously Department of Infrastructure, Regional Development and Cities) (Cth).

A variety of advertising and communication has been undertaken alongside other engagement opportunities for the community, government members, agencies, and regulators, in accordance with the Airports Act.

1 Introduction

1.1 Introduction

This Major Development Plan (MDP) has been prepared for the T4 Express Elevated Road (the Project) at Melbourne Airport.

Melbourne Airport is operated by Australia Pacific Airports (Melbourne) (APAM) Pty Ltd under a long-term lease from the Commonwealth Government. The airport is located on land owned by the Commonwealth Government.

The Project represents a significant investment by APAM to improve passenger vehicle circulation and access to Melbourne Airport in the face of growing patronage.

1.2 Project Summary

The Project involves the development of a new elevated road, directly linking the Tullamarine Freeway and T4 ground transport hub, over the existing long-term car park. The Project will assist in boosting the capacity of the existing landside road system, as travel demands at Melbourne Airport are expected to increase significantly to 2038. The Project is part of a long term APAM initiative to more effectively distribute traffic at Melbourne Airport.

1.3 Major Airport Development Approvals

A major airport development requires the preparation of a MDP under Section 90 of the *Airports Act 1996* (Airports Act), which requires approval from the Commonwealth Minister for Infrastructure, Transport and Regional Development (the Minister). The MDP process is discussed in more detail in Section 3 of this report.

The Project is defined a major airport development under Section 89 of the Airports Act as it involves:

> *(h) constructing a new road or new vehicular access facility, where:*
>
> > *(i) the construction significantly increases the capacity of the airport to handle movements of passengers, freight or aircraft; and*
> >
> > *(ii) the cost of construction exceeds the threshold amount (see subsections (7) and (9));*

The threshold amount under subsection 9 is $25 million. As the cost of construction of the Project is anticipated to be greater than $40 million it is considered a major airport development.

Table 1 below outlines the matters which must be considered by the Minister in determining whether to approve a MDP, pursuant to Section 94 of the Airports Act, and where these matters are addressed in this MDP.

Table 1: Ministerial Considerations

Ministerial Considerations	Addressed in this MDP
(aa) the extent to which the plan achieves the purpose of a major development plan (see subsection 91 (1A));	Section 2: Project Description Section 3.3: Consistency with the Airport Lease Section 3.4: Legal Compliance Section 3.5: Consistency with Melbourne Airport Master Plan and Environmental Strategy Section 3.6: Consistency with State and Local Government Planning Section 3.7: Airport Development and Building Approvals
(a) the extent to which carrying out the plan would meet the future needs of civil aviation users of the airport, and other users of the airport, for services and facilities relating to the airport;	Section 2.2: Project Justification and Objectives
(b) the effect that carrying out the plan would be likely to have on the future operating capacity of the airport;	Section 2.2: Project Justification and Objectives
(c) the impact that carrying out the plan would be likely to have on the environment;	Section 5: Impact Assessment
(d) the consultations undertaken in preparing the plan (including the outcome of the consultations);	Section 8: Consultation and Approval Process
(e) the views of the Civil Aviation Safety Authority and Airservices Australia, in so far as they relate to safety aspects and operational aspects of the plan.	Section 5.12: Aviation Operations and Safety

Appendix A identifies the MDP requirements under the Act and demonstrates that this MDP is consistent with the requirements.

APAM, as the ‘airport-lessee company’ (ALC) under the *Airports Act 1996* for Melbourne Airport, is responsible for the submission of the MDP for the Project.

1.4 Report Structure

This MDP is structured to address the requirements of the *Airports Act 1996*:

- Section 2 describes the Project that is the subject of this MDP;
- Section 3 describes the legislative context and consistency with relevant federal, state and local legislation and policy;
- Section 4 defines the scope of the assessment and describes the assessment methodology used for the assessment of impacts associated with the Project;
- Section 5 describes the impacts that might reasonably be expected to be associated with the Project and the plans proposed for ameliorating or preventing environmental impacts;

- Section 6 provides a summary of the environmental effects of the Project;
- Section 7 provides a summary of compliance with existing Environmental Management procedures; and
- Section 8 defines the consultation and approval process undertaken as part of this MDP.

Appendices

- Appendix A – Checklist for the *Airports Act 1996* requirements
- Appendix B – Detailed Design Drawings
- Appendix C – Preliminary Soil Contamination Assessment (Senversa 2018)

1.5 Project Proponent

As the ALC under the Act, APAM is the Project proponent. Contacts details for APAM are provided below:

Australia Pacific Airports (Melbourne) Pty Ltd

International Terminal,

Locked Bag 16,

Tullamarine, VIC, 3043

The APAM contacts in connection with this proposal are:

Tony Brun

Head of Master Planning

Tony.Brun@melair.com.au

2 Project Description

2.1 The Project

Melbourne Airport is located to the north-west of Melbourne, adjacent to the Tullamarine Freeway. The location of Melbourne Airport in relation to the broader Melbourne Metropolitan area and the Melbourne Airport boundary, is shown in Figure 1. The alignment of the Project is shown in Figure 2. Detailed Design drawings are shown in Appendix B.

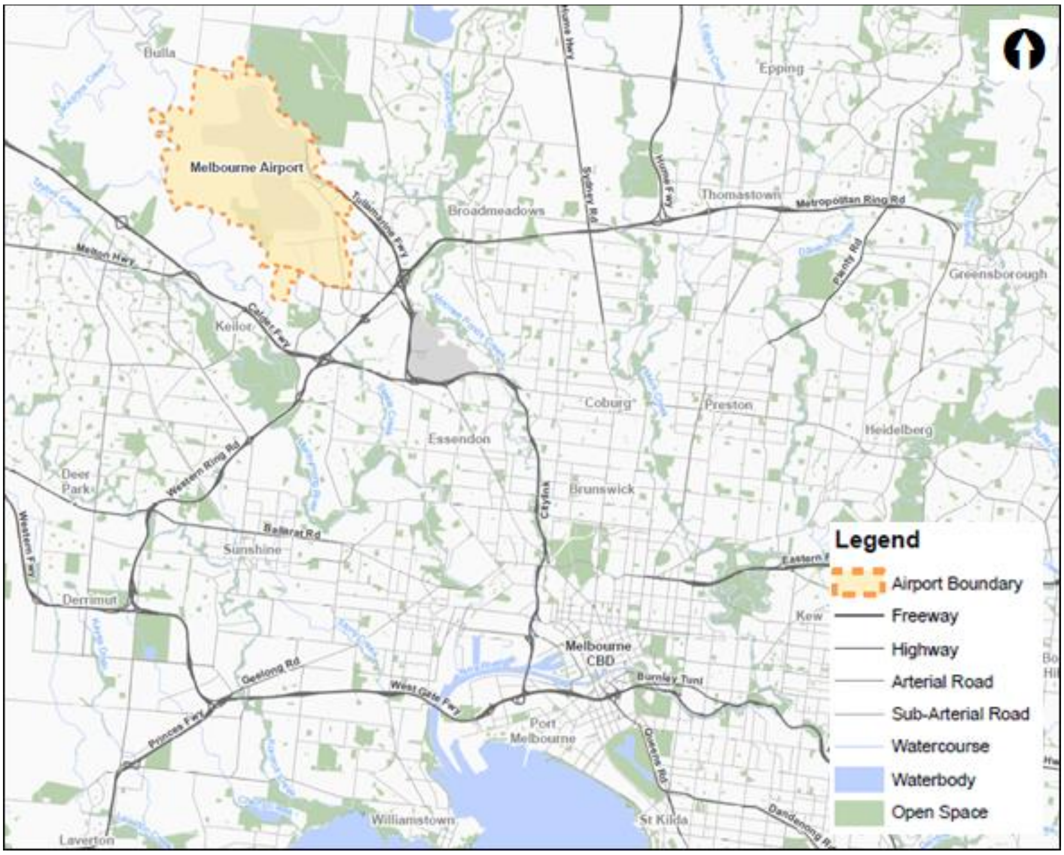


Figure 1: Melbourne Airport land boundary, denoted by the yellow shading, to the north-west of Melbourne city.

The Project is part of a larger landside access strategy involving the development of an elevated road network at Melbourne Airport. This broader project will reduce vehicle congestion, promote transport efficiency and provide increased road capacity. As Stage 1, the Project provides a new direct connection between the Tullamarine Freeway and the existing T4 ground transport hub elevated road.

The Project will facilitate Stage 2, which is not subject to this MDP, referred to as the Elevated Road and Forecourt. Stage 2 will comprise:

- the construction of a one-way elevated road, connecting the existing T4 ground transport hub elevated road and a reconfigured T123 ground transport hub, allowing intersection-free access to all terminal precincts

- an elevated connection from the reconfigured T123 ground transport hub directly into Departure Drive (for drop-off traffic)
- an elevated connection from the reconfigured T123 ground transport hub directly into Melbourne Drive (for pick-up traffic)

The complete elevated road network will be approved and constructed, on a staged basis, with this MDP representing the first step in this approval process. It is expected that planning and approvals for Stage 2 will commence in the second half of 2019 with construction commencing in 2020.

The general configuration of the Project will see vehicles travelling northbound on the Tullamarine Freeway exit left onto a purpose-built off-ramp, approximately 500 metres north of the Mercer Drive exit. At grade, this three-lane roadway will skirt the existing long-term car park, before passing beneath the existing APAC Drive freeway onramp.

The roadway continues towards the existing T4 ground transport hub, where the incline will rise to an approximate height of 12 metres. The roadway will continue to pass over the long-term carpark and Airport Drive, before linking into the existing portion of built elevated road, adjacent (and above) Airport Drive. The roadway is expected to feature 10 pylons. This alignment is shown in Figure 2. An artist render of the completed project is shown in Figure 3. Detailed design drawings are provided in Appendix B. Upon completion, the Project will provide direct access between the Tullamarine Freeway and the T4 ground transport hub.

It is expected the Project will deliver users of T4 a time saving of 30% when accessing the terminal. In addition, the Project will remove 5,000 cars from Airport Drive, benefiting commercial and freight vehicles and users on Mercer Drive.

There are no further changes to the road configuration. With the construction of the Project, it is intended that Mercer Drive will become a dedicated freight and airport business park entry, maintaining two predominant airport entries. This will improve network resilience and travel time reliability for freight and the airport business park. Enabling airfreight to move high-value, time-sensitive and perishable items in a timely manner.

A portion of the project, being the immediate freeway exit, has been undertaken by VicRoads as part of the CityLink/Tulla Widening (CTW) project. These works do not form part of this MDP.

This MDP has been informed by the detailed design process and consultation with key stakeholders, such as VicRoads. This has occurred concurrently with the approvals process as per the provisions of the Airports Act. The *Melbourne Airport Master Plan 2018* (APAM 2018), *2018 Elevated Road Concept* and *2013 Melbourne Airport Landside Movement Feasibility Study* have all been reviewed in the preparation of this MDP.

Figure 2: T4 Elevated Road (the Project) and airport infrastructure

Figure 3: Artist render of T4 Elevated Road upon completion

2.1.1 Project alternatives

Throughout the detailed design process there has been considerable work undertaken to ensure the preferred scheme is appropriate and meets the ongoing needs of Melbourne Airport users and other key stakeholders.

In 2015 an alternative option was considered by the VicRoads Project Review Committee (PRC), which was subsequently endorsed. This alignment, based upon schematic design, features in the *Melbourne Airport Master Plan 2018*. This option, while similar to the preferred option, featured a spur road connecting the T4 Express Link and Terminal Drive (consolidating entry to the airport via this new freeway exit).

Upon commencement of detailed design for the Project, several factors and assumptions related to the original proposal had either changed or been reassessed, these included:

- details of Stage 2 works, including forecourt and car park entry operation
- completion of the CTW project
- design stage (the 2015 PRC report multi criteria analysis was conducted at concept design stage and produced similar results for the original and preferred options)

One of the key differences between these two options, is the consolidated airport entry. The original alignment would take all airport traffic off the Tullamarine Freeway at the T4 Express Link exit, before returning it to Terminal Drive via the spur. This would result in redundant sections of the freeway. The preferred option negates this, maintaining the existing freeway and Terminal Drive configuration.

Subsequently APAM have determined that the change in design (the alignment subject to this MDP) is validated and have received endorsement from VicRoads for this change, in February 2019.

2.2 Project Justification and Objectives

The Project is required to boost the capacity of the existing landside road system, as travel demands at Melbourne Airport are expected to increase significantly by 2038. This demand growth is unable to be accommodated on the existing landside road system without significant and unacceptable impacts on users and airport operations.

Stage 2 works, encompassing the reconfigured T123 ground transport hub, the removal of intersections along routes to all terminal precincts, and intra-network elevated connections, are expected to significantly increase peak capacity throughout the entire network and to reduce queue lengths to below the acceptable level.

The construction of Stages 1 and 2 must be sequential. As such, the Project is required on the basis that it will facilitate the development of the future elevated road network in addition to its own merits, which are described below.

The Project will produce a streamlined user experience and positive outcome, independently of the combined benefits of completing both the Project and Stage 2 of the overall program. The high-level benefits of the Project lie in:

- Increasing the exit capacity potential from Tullamarine Freeway to Melbourne Airport
- Building in flexibility and resilience to the Tullamarine Freeway / Melbourne Airport access
- Improved wayfinding and more convenient access to the T4 ground transport hub
- Key enabling project for Stage 2 of the Elevated Road network
- Facilitating the more efficient delivery of the elevated road network, reducing the incidence of queuing and congestion on the Tullamarine Freeway and within Melbourne Airport, during construction
- Increased opportunities for future expansion of the main Terminal
- Contribute to economic productivity through better transport connections to Victoria's primary aviation gateway.

The Project's objectives are consistent with the *Melbourne Airport Master Plan 2018*. Section 14.2.2 of the *Melbourne Airport Master Plan 2018* clearly identifies the Project as an individual piece of infrastructure, as part of the internal road network improvements. The master plan refers to the Project as a key segment of the network, to be delivered amongst other key infrastructure upgrades, during the 2018 Master Plan period (2018 to 2038).

The Project will improve access to and capacity of the airports road network for both passengers and freight movements and therefore is further supported by the following *Melbourne Airport Master Plan 2018* strategic objectives:

- Increase terminal access and egress capacity to accommodate the forecast passenger demand; and
- Accommodate increases in freight movements in and around the cargo estate and the Melbourne Airport Business Park.

Other general objectives of the Master Plan which the project indirectly supports or facilitates includes:

- Facilitate land use and development in accordance with the Master Plan;
- Maintain Melbourne Airport as a transport gateway for metropolitan Melbourne, particularly the northwest region;
- Provide for long-term aviation growth requirements;
- Encourage sustainable outcomes that optimise infrastructure; and
- Improve the safety and experience of passengers by reducing vehicle–pedestrian conflicts in the forecourt and increasing the separation distance between vehicles and the terminal building.

2.3 Location of the Project

Melbourne Airport is located at the northern end of the Tullamarine Freeway, 22 kilometres north-west of the Melbourne Central Business District (CBD) (as shown in Figure 1). The airport plays an important role in facilitating access to Melbourne and Victoria for both air passengers and freight.

The Airport is well serviced by road transport links to metropolitan Melbourne, regional Victoria, and the ports of Melbourne and Geelong. The Hume Highway and Calder Freeway provide links to the north, the Western Highway to the west, and Tullamarine Freeway to metropolitan Melbourne and the Port of Melbourne. The Tullamarine Freeway also provides a connection to the Western Ring Road to access the Port of Geelong.

The Project itself is located on the eastern boundary of the airport site, where the Tullamarine Freeway intersects the airport lease.

2.4 Airport and Regional Growth

Patronage and freight movement through Melbourne Airport is rapidly growing. Employment numbers at the airport are also expected to increase. Unsurprisingly, Melbourne Airport is one of the key contributors to the Victorian economy, contributing an estimated $17.6 billion to the Victorian economy in 2016-17.

Airport growth in coming years will place increasing pressure on the ground transport network across the airport. In 2016-17, 35.2 million passengers passed through the airport, with this forecast to increase to 67.8 million by 2038. Airfreight is expected to nearly double from 463,000 to 901,000 tonnes annually, while the total airport workforce is expected to increase by more than 15,000 people, to a total workforce of 35,000 people.

To accommodate this increase in passenger, freight and employee demand, upgraded ground transport infrastructure is required. The project is the first stage of an elevated road network which will improve road transport efficiency and create additional road capacity.

Along with the projected growth in Airport patronage, pressure on local and surrounding transport infrastructure will increase. The capacity and efficiency of Airport infrastructure including the road network will need to expand appropriately to accommodate this growth.

Melbourne Airport will be a particularly important gateway for the northern and western metropolitan areas of Melbourne moving forward. Both regions are expected to almost double their population by 2050. Coupled with this population growth will be corresponding development of nominated Places of State Significance, Activity Centres, and existing and emerging employment clusters as defined by the Victorian Government in *Plan Melbourne*.

This Project is crucial to facilitate Melbourne Airport's expansion over the coming decades and to in turn support the growth and economic expansion of Melbourne – and Victoria generally. Planned developments at the airport include the third and potential fourth runways, new terminal buildings and associated facilities, new hotels and a major new freight terminal precinct. All these developments require greater ground transport accessibility.

2.5 Existing Traffic Volumes and Future Demand

Melbourne Airport is a large traffic generator. In the 2016-17 period, 35.2 million people travelled through the airport, which had a workforce of 20,600 employees within the airport precinct. Due to the nature of airport operations, the ground transport demand generated by the Airport is reasonably consistent throughout the day, week and year.

It is estimated that in 2016 there were a total of 127,000 vehicle trips to and from Melbourne Airport on a typical busy day. This demand is inclusive of passenger, employment, commercial development and freight and logistics trips directly associated with the Airport.

The *Melbourne Airport Master Plan 2018* has identified that to 2038, this figure is expected to increase to 240,000 vehicle trips per busy day. The growth in passenger demand and Airport workforce will place increased pressure on the ground transport network both internal and external to the Airport.

2.6 Construction

The Project will link the existing portion of the elevated road network with the Tullamarine Freeway. This existing portion of the elevated road was constructed in 2014-15 and provides access to the T4 ground transport hub (constructed concurrently with the existing portion of the elevated road). The Tullamarine Freeway has recently been widened by VicRoads as part of the CTW project. As part of these works and in line with the recommendation of the 2015 VicRoads PRC, a stub was constructed on the proposed alignment of this project which will be the future connection point for this project. This was constructed as part of the CTW project to negate future construction impacts on the Tullamarine Freeway.

The Project is currently undergoing detailed design, which will inform construction methodology. However, it is assumed that construction impacts will mimic that of the existing elevated road and the functional arrangement and lane configuration will remain unchanged.

It is expected that construction for the Project will occur entirely above ground, with excavation limited to structural piers and surface clearing as part of the site enabling works. While detailed design is an ongoing process, current estimates forecast a total of approximately 17,161 cubic metres (m^3) of soil will be excavated during construction for the placement of piers. Of this figure, 4,450 cubic meters (m^3) are anticipated to be PFAS affected (as discussed further in Section 5.2).

This material will be transported to APAM's existing designated PFAS stockpile on site. The storage of spoil onsite is consistent with requirements under Commonwealth legislation for potentially contaminated soils.

In addition to the spoil removed for the purposes of the Project's construction, 9,562 cubic metres (m^3) of clean material to be imported for the project's construction.

3 Legislative Context

3.1 Introduction

With the exception of the road stub constructed as part of the CTW project, the Project is located within the Melbourne Airport 'airport site' (as defined in the *Airports Regulations 1997* (Cth)) and on Commonwealth land. This is shown on Figure 1 and Figure 2.

Planning and development at Melbourne Airport is primarily regulated by the Airports Act. Part 5 of the Airports Act is particularly relevant as it relates to land use and planning, the airport's Master Plan, and this MDP. Section 112 sets out the Commonwealth's intention that Part 5 of the Airports Act applies to the exclusion of the law of a state, specifically laws of the state relating to land use and planning.

Notwithstanding section 112, section 91(1)(ga) requires this MDP to set out the likely effect of the proposed MDP on traffic flows at the airport and surrounding the airport, employment levels at the airport and the local and regional economy and community, including an analysis of how the proposed development fits within the local planning schemes for commercial and retail development in the adjacent area. In addition, section 91(4) requires that, in specifying a particular objective or proposal in section 91(1)(ga), this MDP will address the extent (if any) of consistency with planning schemes in force in Victoria and, if this MDP is not consistent with those planning schemes, the justification for the inconsistencies.

This section of the MDP describes the consistency of the development with relevant Commonwealth, State and local planning provisions.

3.2 Statutory and Policy Compliance

3.2.1 *Airports Act 1996*

The Project is considered a major airport development under Section 89 of the Airports Act, as discussed in Section 1.3, as the cost of the Project is anticipated to be greater than $40 million.

Section 90 of the *Airports Act 1996* provides that major airport developments must not be carried out except in accordance with an approved MDP.

Section 91 of the Airports Act identifies the required contents of an MDP, which includes:

> *"the airport-lessee company's assessment of the environmental impacts that might be reasonably be expected to be associated with the development; and*
>
> *The airport-lessee company's plans for dealing with the environmental impacts…"*

This MDP has been prepared to address the requirements of the Airports Act. Impacts and proposed mitigation measures are described in Section 5.

Appendix A identifies the Airports Act requirements for a MDP and demonstrates that this MDP is consistent with the requirements.

The key steps in the approval process for an MDP under the Airports Act are shown in Figure 4. It is of note that the preparation and distribution of an Exposure Draft to external stakeholders is not a process mandated under the Airports Act.

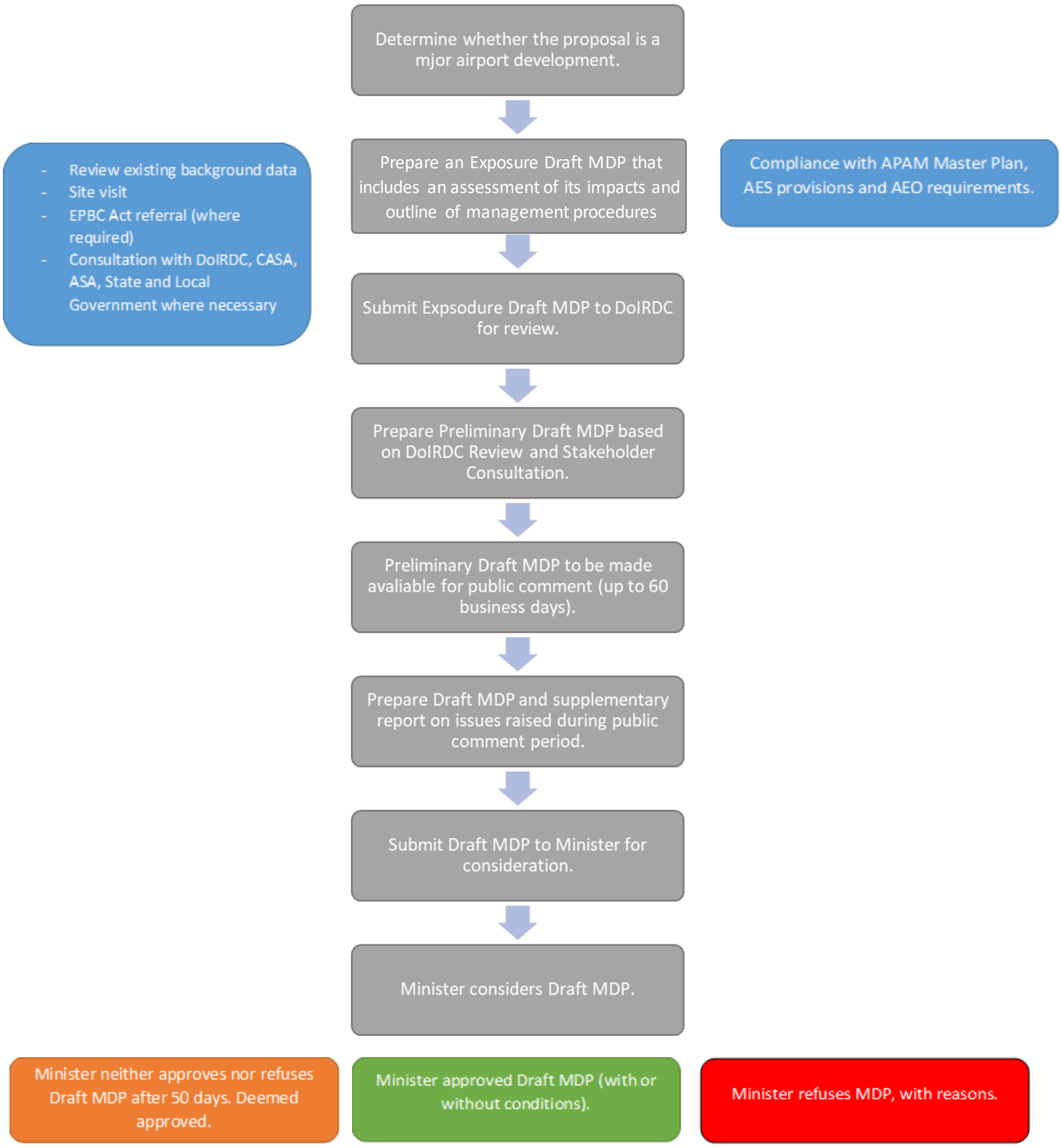


Figure 4: MDP Approval Process

Under the Airports Act, a MDP is usually subject to a 60-business day consultation period (as noted in Figure 4).

3.2.2 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) is the Australian Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places – defined in the EPBC Act as matters of national environmental significance (MNES) which include:

- World Heritage properties
- National Heritage properties
- Wetlands of international importance
- National threatened species and communities
- Migratory species
- Nuclear actions
- Commonwealth marine environment
- Any additional matters specified by the regulations.

The EPBC Act also protects the environment on Commonwealth land and regulates those actions of the Commonwealth departments and agencies that may have a significant impact on the environment. As the Project is located on Commonwealth land it is subject to the provisions of the EPBC Act. For actions on Commonwealth land subject to an airport lease, Appendix D (Significant Impact Guidelines) states that an action which is the subject of a MDP does not need to be referred under the EPBC Act by the person proposing to take the action (as the Minister responsible for approving the MDP is required to seek the advice of the Commonwealth Environment Minister prior to approval).

Consideration of the potential impacts the Project may have on the environment, including matters covered by the EPBC Act, are contained in Section 5 of this MDP. Section 5.2 provides a breakdown of how the project addresses this potential risk and how project design and construction management processes will mitigate any potential impact to MNES or the environment on Commonwealth land.

3.3 Consistency with Airport Lease

3.3.1 Head Lease consistency

The proposed development is consistent with the airport head lease for Melbourne Airport ("Head Lease"), held by APAM under the *Airports Act 1996*. The major development:

- Is for a lawful purpose and does not breach legislation in accordance with Clause 3.1 (a) (iv) of the Head Lease and expanded on below

- Maintains the environment of the airport in accordance with clause 6 of the Head Lease
- Complies will all legislation relating to the airport sites and its structures or use or occupation in accordance with clause 7.1 of the Head Lease
- Does not grant any sublease or license prohibited under legislation, in accordance with clause 10 of the Head Lease
- Has regard to actual and anticipated future growth in, and pattern of, traffic demand for the Airport site as required by clause 12.1(a) of the Head Lease
- Will be to the quality standards reasonably expected of an airport in Australia and will have regard to good business practice, in accordance with clauses 12.1(b) and (c) of the Head Lease.

In developing this MDP, all interests existing at the time the Head Lease was created were identified including easements, licenses, leases and sub leases. There are no conflicts or inconsistencies existing between these interests and any part of the proposal in this MDP. APAM will ensure that any development works allowed under this MDP will not interfere with the rights granted under any pre-existing interest, namely impacts during construction upon the long-term carpark.

There are no known impacts to any pre-existing interests of adjacent property owners, with reference to VicRoads.

3.4 Legal Compliance

An essential requirement of the lease is that the lessee must comply with all legislation relating to the airport site. Section 91 (1A) of the Airports Act states that all major development is to be consistent with the airport lease.

APAM, as the ALC for Melbourne Airport, has an obligation to ensure all developments on airport land are consistent with the legislation and development to maintain appropriate urban planning and ensure safe and sustainable outcomes. APAM must confirm that any proposal on airport land is consistent with:

- The *Melbourne Airport Master Plan 2018*
- Any approved Major Development Plan for the airport (*Airports Act 1996*, section 90), if applicable
- The approved Environmental Strategy (incorporated as part of the *Melbourne Airport Master Plan 2018*)
- APAM's planning objectives for the airport.

3.5 Consistency with the Melbourne Airport Master Plan and Environmental Strategy

The *Melbourne Airport Master Plan 2018* provides a development framework for the Airport to 2038. The Master Plan includes integrated planning for aviation activity, land use, commercial development and environmental management to achieve sustainable growth.

Within the *Melbourne Airport Master Plan 2018*, the Ground Transport Plan provides direction in the planning of the internal road network, management of airport access modes and the external road network. The master plan explicitly lists development of the Project and Stage 2 as key segments of the network to be delivered in the 2018 master plan period.

In addition to the internal and external road network, the *Melbourne Airport Master Plan 2018* also provides direction on public transport access to the airport. As such the master plan provides an indicative alignment and reservation for a future rail connection, via Airport Drive. The Master Plan shows the alignment of the Project crossing that of the potential airport rail link. While the details of this alignment are not confirmed, it is understood the rail alignment will feature sections of both elevated and at grade rail before descending underground to station platform level. APAM have discussed with Rail Projects Victoria (RPV) any potential interface between the Project and a future rail link. The project is consistent with the indicative rail alignment as identified in the *Melbourne Airport Maser Plan 2018*.

Additionally, the Ultimate Master Plan Concept articulates the Airport's vision for long-term land use planning. The project is consistent with the airport land use plan on the basis it supports access to an intensified and consolidated terminal precinct, helping to enhance and expand the terminals to ensure ongoing essential passenger services.

The environment strategy, imbedded within the *Melbourne Airport Master Plan 2018*¸ details the environment constraints on the airport lease and how development of the airport may impact these values. The Project is consistent with the environment strategy on the primary basis that it does not affect any environmentally sensitive areas as defined within the strategy. Further, works undertaken constructing the Project will be done in accordance with a Construction Environment Management (CEMP) (as per the requirements of the strategy), managing any potential impacts to environmental values.

3.6 Consistency with State and Local Government Planning

Being on Commonwealth land, the Melbourne Airport APAM lease is subject to the planning provisions of the *Airports Act 1996* and other relevant legislation including the EPBC Act. As a result, state and local planning provisions, under the *Planning and Environment Act 1987* and subsequent relevant planning scheme, *Environment Protection Act 2017* and *Environment Effects Act 1978* are not directly applicable to development occurring at the airport.

The Act does however require an MDP to address, where possible, the extent of any potential inconsistencies between the prevailing planning scheme in force, under a law of a State or Territory in which the airport is located. This requirement addressing relevant State and local planning provisions is discussed below.

3.6.1 Planning Policy Framework

3.6.1.1 Plan Melbourne

Plan Melbourne is the State Government of Victoria's plan that outlines the vision for Melbourne's growth to the year 2050. A refresh of *Plan Melbourne* was released in March 2017, with revised growth figures and objectives. *Plan Melbourne* identifies the infrastructure, services and major projects which need to be put in place to underpin the cities growth.

Melbourne Airport has been recognised in *Plan Melbourne* as a Place of State Significance. Melbourne Airport was also recognised as a Transport Gateway for the Victorian Region, a crucial hub for the movement of passengers and freight both in and out of Victoria.

This development supports objectives within *Plan Melbourne*, to '*ensure sufficient airport capacity with efficient landside access for passengers and freight…'* for the Melbourne Metropolitan region and wider Victoria.

3.6.1.2 Planning Scheme VC148 Amendment

In August 2018 the Victorian state government introduced Amendment VC148 into the Victorian Planning Provisions (VPP). Amendment VC148 is part of the Smart Planning program's reforms to simplify and modernise Victoria's planning policy and rules to make planning schemes more efficient, accessible and transparent.

While this program of reforms affects VPP applicable to airport development, such as Clause 18.04 (Airports) and 51.04 (Melbourne Airport Environs Strategy Plan), the changes to VPP content do not impact the Project. Further the Project remains consistent with the VPP and Amendment VC184.

3.6.2 Victorian Freight Strategy

In July 2018, the Department of Transport (previously known as Victorian Department of Economic Development, Jobs, Transport and Resources) launched *Delivering the Goods – Victorian Freight Plan*. This Freight Plan outlines a long-term strategy for improving freight efficiency, productivity and connectivity to Victorian businesses with local, national and international markets.

This Freight Plan states that 28% of Australia's international freight passes through Melbourne Airport, with air freight expected to increase steadily on the back of nearby Asian markets. This Freight Plan identifies that Victoria will need to address major projected growth in this sector (which is beyond population and economic growth) to remain competitive. To meet these challenges, the Freight Plan outlines several key strategies and actions to implement over coming years.

The Project aligns closely with the objectives and strategies of the Freight Plan, in allowing the local and surrounding Airport road network to efficiently handle increased volumes of freight traffic, namely by redirecting passenger vehicle away from the business park and maintaining a separate airport entry point for freight vehicles via Mercer Drive.

3.6.3 Local Planning Policy Framework

An assessment of the Project against the provisions of the Hume planning scheme has been undertaken and is provided in Section 5.7.

3.7 Airport Development and Building Approvals

In addition to the preparation and approval of the MDP, new development is subject to Airport Lessee Consent from APAM and a Building Approval from the appointed Airport Building Controller (ABC).

As APAM is the project proponent, the internal APAM approval process will also be undertaken.

The Building Approval cannot be issued by the ABC without written consent from APAM, confirming that the new development is consistent with:

- *Melbourne Airport Master Plan 2018* as the current approved airport Master Plan;
- Environmental Strategy;
- Planning objectives for the Airport; and
- An approved MDP.

In addition to the above, works will be unable to commence until an appropriate Construction Environmental Management Plan (CEMP), has been submitted and approved by the Airport Environment Officer.

4 Assessment Methodology

4.1 Assessment Scope

In accordance with Section 91 of the Airports Act, the scope of the assessment includes consideration of the following potential impacts from the Project:

- Transport;
- Land Contamination;
- Surface Water drainage;
- Ecology;
- Air Quality;
- Noise;
- Land Use and Tenure;
- Economic and Social;
- Landscape;
- Cultural Heritage;
- Hazardous Goods; and
- Aviation Operations and Safety.

4.2 Document Review

Reference has been made to previous studies at Melbourne Airport to inform the description of the baseline environment at the site. This includes analysis of information from previous MDPs. A desktop review was carried out of the following documentation:

- *Melbourne Airport Master Plan 2013* (APAM, 2013)
- *Melbourne Airport Master Plan 2018* (APAM, 2018)
- *Melbourne Airport Ecology Gaps Study* (Biosis, February 2018)
- *Heritage Gaps Study* (Biosis, February 2018)
- *Landside Movement Feasibility Study and Report* (Arup, August 2013)
- *CityLink/Tulla Widening: Melrose Drive, Airport West – Apac Drive, Melbourne Airport, CHMP 13446* (Dr Vincent Clark and Associates, March 2015).

Additionally, detailed traffic and soil contamination investigations were undertaken to inform this MDP.

4.3 Site inspection

Site investigations were conducted to inform the soil and land contamination investigations for the MDP. These investigations included:

- Non-destructive clearance testing of the proposed soil bore locations of underground services, using a specialist underground service locator; and
- Collection of soil samples from seven boreholes, bored to a depth of 2 metres (or natural soils, whichever came first). Samples were collected using push-tube sampling techniques.

Site investigations were also undertaken for the cultural heritage and ecology reference material used to inform this MDP.

4.4 Assessment of impacts

To assist in the assessment of potential impacts identified in this report and to ensure consistency between topics, significance criteria have been defined which follow the generic framework shown in Table 2.

The use of significance criteria to assess impacts is a standard technique applied in impact assessments of this nature and is an approach that has been consistently used by APAM in MDPs at Melbourne Airport. This approach enables different topics (e.g. noise and ecology) to be assessed in a consistent manner against the same criteria which are set in an ascending scale of potential significant impact and ability to mitigate those impacts.

Impacts can also be beneficial, where a project delivers a positive outcome to the community and environment. This is particularly true for economic and social criteria.

Table 2: Environmental, Social and Economic Significance Criteria

Significance	Impact classification	Criteria
High	A significant impact	Environmental effects are likely to be important considerations at a local scale and, if adverse, are potential concerns to the Project depending upon the relative importance attached to the issue during the decision-making process. Considerable adverse change to current amenity, lifestyle and everyday community activities. Mitigation measures and detailed design work are unlikely to remove all the effects upon the affected communities or interests. Residual effects would be pre-dominate.
Moderate	Impact moderate but liveable for most people	These effects, if adverse, while important at a local scale, are not likely to be key decision-making issue. Nevertheless, the cumulative effects of such issues may lead to an increase in the overall effects upon a particular area or on a particular resource. Noticeable adverse change to current amenity, lifestyle and everyday community activities but with scope for mitigation. They represent issues where effects would be experienced but mitigation measures and detailed design work may ameliorate/enhance some of the consequences upon

Significance	Impact classification	Criteria
		affected communities or interests. Some residual effects would still arise.
Low	Impact recognisable but acceptable	These effects may be raised as local issues but are unlikely to be of importance in the decision-making process. Nevertheless, they are of relevance in enhancing the subsequent design of the Project and consideration of mitigation measures. There may be localised or limited noticeable change to current amenity, lifestyle or everyday community activities.
Negligible	Minimal change	No effects or those which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

5 Impact Assessment

5.1 Traffic

5.1.1 Baseline

The Tullamarine Freeway has traditionally been the primary access to the airport. In 2013, this route catered for over 70% of traffic movements to the airport in the AM and PM peak hours. Whilst this has marginally reduced with the completion of Airport Drive, it nonetheless caters for over 60% of traffic during peak periods based on 2018 figures.

The recent completion of the CTW project has supported access to the airport by increasing the capacity of the Tullamarine Freeway up to the Terminal Drive exit. Traffic data between 2016 and 2018 suggest daily volumes increasing from 41,250 vehicles to 42,420 vehicles on the northbound carriageway.

This increase is expected to continue, with the passenger turnover at the airport anticipated to close to double over the next 20 years. The airport currently caters for 127,000 vehicles per day, which is anticipated to increase to 240,000 vehicle trips per day (close to a 90% increase) by 2038.

Based on the 2018 traffic model, under a Do-Nothing scenario, the queuing in the AM peak period from the Centre Road and Terminal Drive intersection would extend over three kilometres back onto the Tullamarine Freeway from 6:45am to 9am by 2023. This is shown in Figure 5.

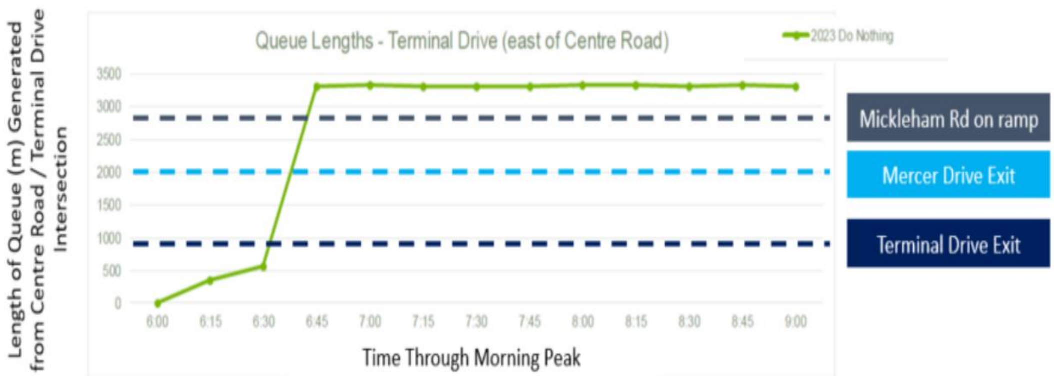


Figure 5: 'Do Nothing' traffic queues by 2023

The scale of the queuing as modelled, suggests that not only the airport road network would be impacted under the Do-Nothing scenario, but other areas including:

- Northbound traffic travelling to Sunbury which may be caught in queues extending to the Tullamarine Freeway
- Access to the Melbourne Business Park from Mercer Drive
- Mickleham Rd on and off ramp traffic which experience delays joining or exiting the freeway due to queuing traffic.

It is noted that the term queuing relates to a slow-moving queue where traffic is generally travelling slower than 10km/hr and no more than 12km/hr, rather than necessarily a stationary queue.

Because of the queuing the anticipated journey time for traffic from the Tullamarine Freeway to Terminal 1, 2 and 3 would increase by 15 to 20 minutes in the AM peak.

5.1.2 Assessment of Impacts

Verkehr In Städten - SIMulationsmodell (Traffic In Cities - Simulation Model) (VISSIM) modelling has been undertaken to consider the Do-Nothing option based on the existing network configuration, and the Project, using 2023 traffic volumes.

Detailed traffic model outputs were produced for the following:

- Network performance – network operating performance impacts
- Travel times – vehicle travel times along certain routes
- Intersection performance (queues and delay) – operating performance of key intersections
- Signal timing comparison – average phase time of the key intersections
- Average speed plots – plots indicating average speed per peak hour

Overall network parameters are similar between the two options tested, with a slight improvement with the inclusion of the Project. The Project alone is unlikely to have any substantial benefit to the network, however this needs to be considered within the context of Stage 2, which the Project directly facilitates. Without the Project, the benefits of Stage 2 cannot be realised.

A summary of VISSIM network performance modelling outputs for the 2023 Do Nothing and Project options are presented in Table 3 below, showing marginal benefit (generally by ≤3%) to the Project over the Do-Nothing scenario.

Table 3: Summary of Stage 1 modelling results (Aurecon 2019)

Parameters	2023 Do Nothing	2023 T4 Express Link	Difference	Difference (%)
Average delay per vehicle (s)	331.1	323.9	-7.2	-2.2%
Average Speed (km/h)	18.1	18.6	0.5	2.8%
Total Distance Travelled (km)	100196	102475	2279	2.3%
Total Travel Time (h)	5520.5	5509.2	-11.3	-0.2%
Total Completed Trips	40804	41248	444	1.1%

Travel times (in seconds) were calculated from the microsimulation models for key routes, for two temporal blocks within the morning peak period (6:30 – 7:30am and 7:30 – 8:30am) for each scenario. Overall the trend and the travel times are comparable, however the Project delivers a 30% faster journey to the T4 terminal than current (or without the Project).

With regards to intersection performance, both with and without project scenarios experience queuing back to the Mickleham Road interchange by approximately 6:45am. Further queuing is expected to extend back along the Tullamarine Freeway (beyond the extent of the model). This is not expected to recover within the 6 – 9am period.

Due to increased vehicle demand towards the airport, speed plot results indicate little to no difference between the two options. Modelling suggests that the average speed along the Tullamarine Freeway will be less than 10 km/hr due to the increase in demand. However, the addition of the Project removes 5,000 cars from Airport Drive, benefiting commercial and freight vehicles and users.

A qualitative multi-criteria analysis has also been undertaken against the Do-Nothing scenario, for the following criteria:

- Geometry and departures from standards
- Traffic operational performance
- Integration with other projects
- Wayfinding and route legibility
- Property and commercial impacts
- Constructability
- Safety
- Capital cost
- User experience

The Project consistently received a higher score than the original alignment when the two options were compared against the No Nothing option. Additionally, the Project's merit, in terms of construction and appropriateness, is further validated by formal VicRoads endorsement of the alignment through the PRC process in February 2019.

With regards to construction impacts, the project is expected to be constructed offline, with minimal traffic interface. As such the impact to the traffic network is expected to be **negligible**. This is predominantly due to the Project (in comparison to the original option with the spur) not requiring reconfiguration of Terminal Drive during construction. There are expected to be low construction impacts upon receptors and the existing traffic network, any impact of which is capable of being mitigated through an effective Traffic Management Plan.

Operational traffic impacts of the project are expected to be **low beneficial**. This is due to improved travel times and access to the T4 Ground Transit Hub and operational efficiencies of removing passenger vehicles from Airport Drive.

However, this modest rating is also in the context of most of benefits to the transport network being achieved post construction of Stage 2.

5.1.3 Mitigation Measures

Mitigation measures to reduce the impact of the Projects construction on the transport network will be implemented through a Traffic Management Plan as part of the CEMP process.

5.2 Soils and Land and Groundwater Contamination

5.2.1 Baseline

Ground conditions at Melbourne Airport are detailed on the 1:63,360 geological map sheet of Sunbury, indicating that all of Melbourne Airport is underlain by Quarternary age Newer Volcanics. This material is reported on the map sheet to comprise basalt rock, ash and tuff. The generalised soil profile encountered during the soil investigation works is described in Table 4.

Table 4: Generalised Soil Profile

Approximate Depths (m bgl)	Lithology Type	Description
0 – 0.8	Fill	Grey to brown, fine to medium gravel, minor sand, clay and silt.
0.3 – 2.7	Clay to Silty Clay	Grey to red-brown, medium plasticity, firm
0.6 – 3.0	Sand Clay to Sand	Lenses and thin layers of pale grey to white, fine grained calcareous sands, low plasticity clay, sands becoming orange-brown with weathered basalt gravels with increasing depth. Borehole refusal was encountered at four locations on suspected basalt bedrock at 1.9 to 3.0 m bgl.

Previous geotechnical investigations around Melbourne Airport are consistent with this assessment, with the materials encountered in boreholes typically comprising two to three meters of stiff to very stiff basaltic clay, overlying basalt rock.

The operation and development of the site as an airport present the potential for contamination of soil and groundwater from sources including fuels, oils, solvent based chemicals and aqueous film forming foams.

The *Melbourne Airport Master Plan 2018* acknowledges the historical land contamination present on the airport lease. It also states the need for this contamination to be effectively managed. As the airport expands, it is likely that works will interact with areas of contamination and that the risk of new impacts will need to be minimised.

Site specific data provided by APAM show groundwater near the airport sitting at least 15 metres, and generally 20 – 25 metres, below ground level (bgl). This excludes two wells located near Moonee Ponds Creek (which are more than 700 meters to the north of the Project's alignment). Groundwater is expected to flow from east to west towards the airport runways and in the direction of Arundel Creek and the Maribyrnong River.

5.2.2 Assessment of Impacts

A Preliminary Soil Contamination Assessment (PSCA), including intrusive soil investigations, was undertaken in July 2018 to assess the potential for contamination in the shallow subsurface soil (up to 3.0 metres below ground level) along the Project's proposed alignment.

The PSCA is attached to this MDP in Appendix C. The sampling locations are provided in Figure 6.

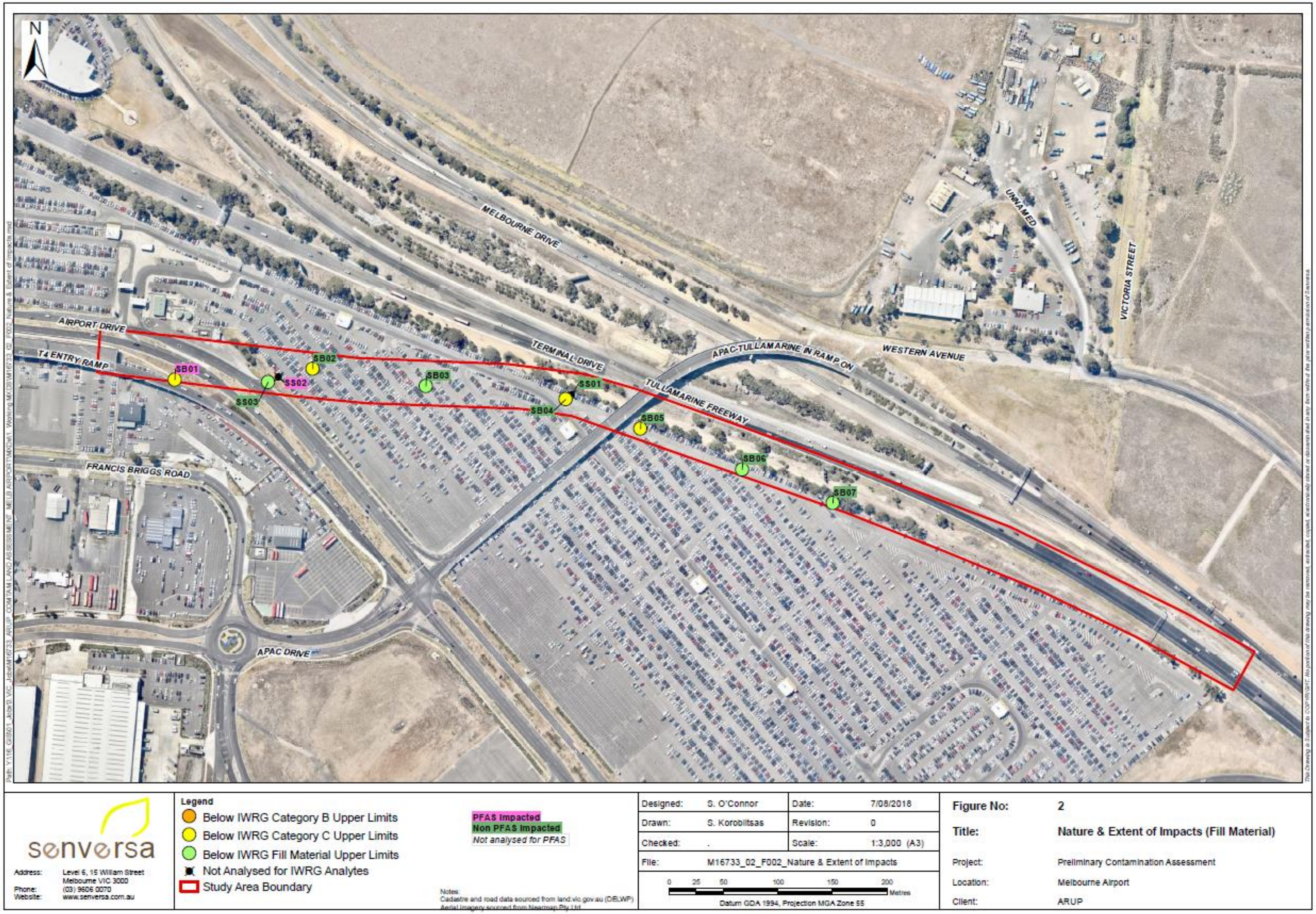


Figure 6: Sampling locations

Following laboratory analysis of the soil investigations, results were compared against health-based and Industrial Waste Resource Guidelines classification criteria. Concentrations of Per- and poly-fluoroalkyl substances (PFAS) have been screened against the National Environmental Management Plan (NEMP) interim landfill acceptance criteria. The results of this analysis demonstrate:

- No analytes, including PFAS, were detected above the health-based criteria for ongoing commercial/industrial use
- The natural soils are not impacted by PFAS and are chemically consistent with an IWRG Fill Material categorisation
- The fill soils beneath the paved areas of the proposed alignment (long-term car park and roads) are not impacted by PFAS and are chemically consistent with an IWRG Fill Material or Category C Contaminated Soil
- One primary fill sample reported a detectable concentration of PFAS (PFOS at 0.005mg/kg). This sample was taken at surface from an unpaved area. In addition, a quality assurance sample taken at the surface in a nearby unpaved area also contained detectable levels of PFOS (0.0005 mg/kg). These locations are shown highlighted in pink in Figure 6. Both concentrations are below the NEMP interim landfill acceptance criteria for disposal to unlined landfill.

Assuming adoption of appropriate control measure, the potential impacts of the Project on contaminated soil has been assessed as **low** during construction and **negligible** during operation.

Given the expected depth to groundwater of approximately 20 metres it is highly unlikely that any aquifer will be intersected during the construction works. For this reason, dewatering is not expected to be required during the construction works. Through using appropriate control measures, should unexpected (e.g. perched) groundwater be encountered, the potential impacts of the Project on groundwater contamination has been assessed as **negligible** during both construction and operation.

5.2.3 Mitigation Measures

PFAS impacted soils identified in unpaved areas of the site are to be reused on site (where possible) in accordance with Section 12 of the *PFAS National Environmental Management Plan*. To ensure compliance with the *Industrial Waste Resource Guidelines* and *PFAS National Environmental Management Plan*, a Soil Management Plan (SMP) will be prepared to outline control measures and requirements for the handling, segregation, stockpiling, reuse and disposal of excavated soils during the Project. Approximately 4,450 cubic metres (m^3) of potentially PFAS-impacted soils are expected to be excavated during these works and managed under the SMP.

Prior to construction, a Construction Environmental Management Plan (CEMP) will be developed and will include the SMP. This will detail the required mitigation measures to be implemented during construction to prevent or manage impacts arising from soils or land contamination, these include:

- All fill material imported to the Project site must comply with APAM procedures to ensure that no contaminated materials are imported to the site
- Hazardous goods stored at the site during construction and operation are to be stored appropriately
- If suspected contamination is encountered at the site, works will cease in that area and a suitably qualified specialist will advise on necessary management measures including sampling if required.

The CEMP will also cover control measures should unexpected groundwater be encountered. While appreciable levels of groundwater are not expected, small pockets of perched water may require management. Such mitigation measures would include:

- Storage of water within bunded IBCs
- Testing of water prior to disposal
- Transportation under appropriate EPA licences.

5.3 Surface water and drainage

5.3.1 Baseline

The study area for the surface water and drainage assessment is located within the Steele Creek sub-catchment of the Maribyrnong Catchment.

Under existing conditions rainwater in the study area falls into the following areas:

- The Tullamarine Freeway northbound carriageway
- Landscaped batters within the Tullamarine Freeway Road reserve
- The elevated entry ramp from Apac Drive to the Tullamarine Freeway
- The Melbourne Airport long term car park
- The Airport Drive road reserve.

The existing drainage network has been assessed at a high level using Dial Before You Dig (DBYD) information and information provided as part of the *Melbourne Airport Landside Movement Feasibility Study (2013).*

This information indicates that the section of the Tullamarine Freeway within the study area drains via a pit and pipe network owned by Melbourne Airport and connects to the Mercer Drive drainage network. This network discharges to an open channel between DHL Express and the bus holding area near the intersection of Francis Briggs Road and Airport Drive. The open channel outlets to Steel Creek North west of the access road located behind DHL Express.

DBYD information indicates the elevated entry ramp from Apac Drive to the Tullamarine Freeway drains via grated pits located at bridge piers and connects into the long-term car park drainage network. The piped drainage network beneath the long-term car park discharges towards the south-west corner of the car park. The drainage network connects to the 1050-millimetre pipeline running beneath Mercer Drive prior to discharging to the open channel and Steele Creek North as described above.

The section of Airport Drive within the study area drains via a pit and pipe network running south-east along Airport Drive. This connects to a piped network running on the eastern side of Francis Briggs Road. The outlet of the pipe next to Francis Briggs Road is assumed to connect to Steel Creek North to the north of the Melbourne Airport Staff Car Park.

5.3.2 Assessment of Impacts

Design information from the *Melbourne Airport Landside Movement Feasibility Study* (2013) suggests the Project will grade downwards from the T4 entry ramp on Airport drive towards the Tullamarine Freeway. This will intercept rainfall that would have fallen in the areas described in Section 5.3.1 and direct surface flows towards the Tullamarine Freeway.

Currently flows within the study area all ultimately discharge to Steele Creek North and this will remain the case after the construction of the Project. However, the diversion of flows towards the Tullamarine Freeway will change the points at which surface flows enter the Melbourne Airport piped drainage network. In general, it is expected that flows to the piped network along Airport Drive, Francis Briggs Road and the Long-Term Car Park will be slightly reduced, while flows to the piped network at the Tullamarine Freeway and Mercer Drive will be slightly increased. This may result in additional flows using existing pipe infrastructure in some areas.

There are many landscaped batters associated with the Tullamarine Freeway proximity to the proposed. The construction of the Project will replace the pervious area with impervious pavement which will further increase flows to the piped network.

Runoff from the new pavement area will be required to meet pollutant reduction targets outlined in the CSIRO *Urban Stormwater Best Practice Environmental Management Guidelines (1999).*

Based on the above, it is considered that the impacts to surface water and drainage arising from the Project during construction and operation are **low**, as the issues are expected to be local in nature and capable of being mitigated during detailed design through effective measures such as providing detention storage and utilizing existing pollutant traps and filters.

5.3.3 Mitigation Measures

The Project drainage design will be developed to match existing drainage conditions as much as possible to maximise use of the existing drainage infrastructure. This will include incorporating drainage outlets at bridge piers and connecting these into the long-term car park drainage network to prevent all flows being diverted to the Tullamarine Freeway.

In a major flood event, it is expected that surface flows will bypass the elevated road drainage system and drain to the Tullamarine Freeway. The impact on flow width on the Tullamarine Freeway has been considered during design.

It is expected that, at a minimum, detention storage will be required to offset the increase in impervious area and projected increase in rainfall intensity due to climate change. There is likely to be limited opportunity to incorporate storage along the elevated road and it may be necessary to incorporate storage beneath the long-term car park or in the existing piped network along Mercer Drive or Airport Drive.

Similarly, it is expected that it will be challenging to implement treatment measures to achieve pollutant reduction targets within the Project. It is recommended that existing treatment elements used to treat runoff from the long-term car park and Mercer Drive be assessed to determine if there is capacity for additional flows. If this is not the case, alternative options such as gross pollutant traps and filters beneath the long-term car park to treat runoff from the elevated road will be investigated.

5.4 Ecology

5.4.1 Baseline

The area generally surrounding the Project is a highly urbanized, modified environment that has been cleared of native vegetation to accommodate the current land use. The area surrounding the project is hardstand, with pockets of vegetation, considered to be of limited value for fauna (Biosis, February 2018). The area surrounding the Project is shown on Figure 7.

As discussed in Section 3.1, the provisions of state and local legislation are not applicable to Commonwealth land under the Airports Act. Therefore, with regards to ecology, the scope of this MDP focuses on matters protected under the EBPC Act. This approach aligns with the *Melbourne Airport Master Plan 2018* focus on Commonwealth matters over state. For completeness a desktop review[1] was undertaken investigating the presence of any known Ecological Vegetation Classes (EVC), protected by state legislation, within the project footprint. This review found there to be no EVCs within the project footprint.

The *Melbourne Airport ecology gaps study* (Biosis, February 2018) identified Matters of National Environmental Significance (MNES) under the EPBC Act, found on the airport lease.

The nearest MNES to the Project, mapped along the Tullamarine Freeway, is the Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP), an ecological community listed as critically endangered under the EPBC Act. This is approximately 200 meters south of where the freeway reservation enters the airport lease. This is shown on Figure 7.

Area of vegetation exist to the north and south of the Apac Drive overpass, on a freeway embankment that is expected to be impacted by construction works and by the project footprint. This area of vegetation was not identified in the Biosis report as containing any MNES.

The *Melbourne Airport ecology gaps study* (Biosis, February 2018) states that two species listed as threatened under the EPBC Act are considered likely or known to utilise habitat within Melbourne Airport land. These include the Grey-Headed Flying Fox *Pteropus poliocephalus* and the Growling Grass Frog *Litoria raniformis* (found in the Moonee Ponds and Arundel Creek). Both are considered vulnerable according to the EPBC Act.

5.4.2 Assessment of Impacts

As discussed in Section 3.1, the provisions for assessing and protecting ecology on Commonwealth land falls to the EPBC Act.

Where impacts to vegetation are known (such as within the freeway reservation), no listed MNES under the EPBC Act, are expected to be impacted.

[1] NatureKit, 2019 (http://maps.biodiversity.vic.gov.au/viewer/?viewer=NatureKit)

While the Project is not located within any known or potential habitat areas, any potential impact to fauna arising from habitat removal (namely that of the Grey-Headed Flying Fox), is reduced by the presence of better quality habitat elsewhere nearby, such as along creek lines.

The projects location in a heavily disturbed landscape and physical separation from identified vegetation or ecological communities, further negates any potential impact.

As such, there are expected to be **negligible** on-site impacts to during the construction and operation of the Project.

5.4.3 Mitigation Measures

While there are not expected to be any onsite impacts to biodiversity, the following mitigation measures will be implemented, where practicable:

- Reinstatement of vegetation removed through landscaping in accordance with the Melbourne Airport Planting Guidelines
- Where possible mature trees are to be retained. If not possible, their removal will be done in accordance with APAM procedure
- Wildlife handling protocols will be in place in accordance with the *Wildlife Rehabilitation* guidelines produced by the Victorian Department of Environment, Land, Water and Planning (DELWP), with these communicated to site personnel. If animals are encountered, a suitably qualified wildlife handler will be contacted

Additionally, landscape planting with local native species, in accordance with the Planting Guidelines, will be included as part of any landscaping undertaken.

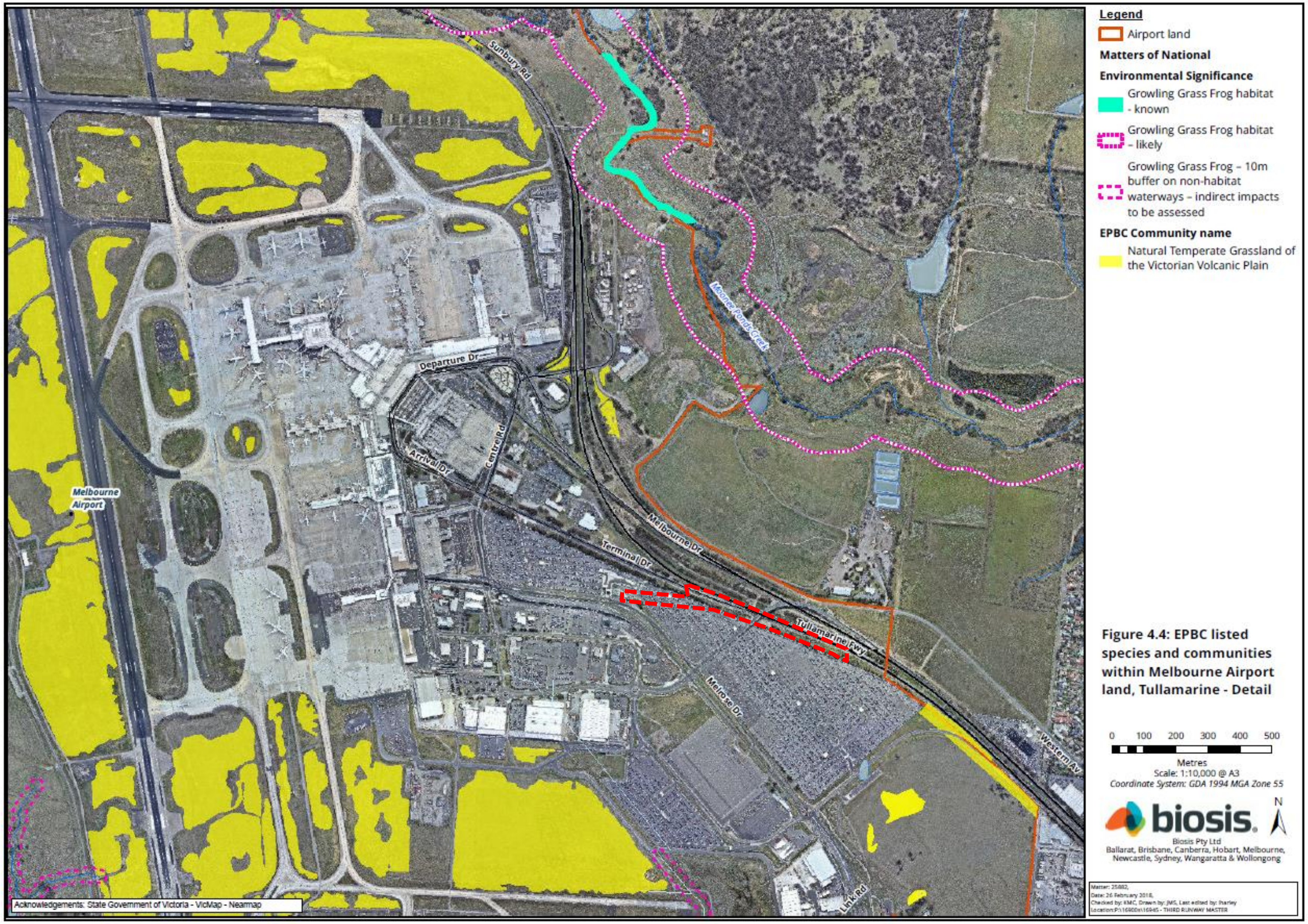


Figure 7: EPBC listed species and communities within Melbourne Airport land, Tullamarine (T4 shown in red) (Biosis 2018)

5.5 Air Quality

5.5.1 Baseline

Airports comprise many sources of air pollution including aircraft, airside ground support equipment, airport terminals and landside activities such as vehicle movements. A significant source of air pollution at and beyond Melbourne Airport is related to surface transport associated with passengers, workers and freight accessing the airport.

When compared to other international airports Melbourne Airport is unique as landside access relies solely on road transport. With travel demands at Melbourne Airport predicted to increase significantly over the next 20 years, there is also expected to be an increase in localised congestion and subsequent air quality impacts (on the basis that congested traffic has greater air quality impact than free-flowing traffic).

The broader elevated road network, while not subject to this MDP, is discussed in this appraisal is a part of the preferred option.

Air quality legislation sets the standards of which the Project must meet. The *National Environment Protection (Ambient Air Quality) Measure*[2] *(NEPM)* sets national standards, at a commonwealth level, for ambient air quality. The Victoria Government developed the *State Environmental Protection Policy (Ambient Air Quality) (SEPP AAQ)* to adopt state-wide air quality standards and goals in line with those set out in the NEPM. Standards are health based founded on an extensive body of documented scientific evidence relating to air pollution and its potential health consequences. Standards are set for several different pollutants. Table 5 shows the standards for particulate matter (PM_{10} and $PM_{2.5}$) and nitrogen dioxide (NO_2) which are the main pollutants generated by vehicles.

Some pollutants have criteria expressed as annual average concentrations due to the chronic way in which they potentially affect health or the natural environment (i.e. effects occur (long-term) after a prolonged period of exposure to elevated concentrations) and others have criteria expressed as 24-hour, 1-hour or 15-minute average concentrations (short-term) due to the potentially acute way in which they affect health or the natural environment (i.e. after a relatively short period of exposure).

Table 5: Air Quality Standards as set out in SEPP (AAQ)

Pollutant	Standard	Averaging Period	Allowable exceedance
NO_2	120 ppb	1-hour	1 day per year
	30 ppb	Annual	None
PM_{10}	50 µg/m^3	24-hour	None
	20 µg/m^3	Annual	

[2] National Environment Protection Council, N*ational Environment Protection (Ambient Air Quality) Measure*, February 2016

Pollutant	Standard	Averaging Period	Allowable exceedance
$PM_{2.5}$	25 µg/m³	24-hour	None
	8 µg/m³	Annual	
Note: ppb = parts per billion µg/m³ = micrograms per cubic metre			

Local meteorology conditions, such as wind direction and speed affect dispersion of pollution in the local area. The predominant wind direction near Melbourne Airport is from the north. Strong northerly winds dominate during the winter months, with mild southerlies dominating during the summer months. Pollution from the airport would be dispersed downwind, therefore it is likely that areas to the south and north of the airport are most affected by pollution depending on wind direction.

Melbourne Airport carry out air quality monitoring at their southern boundary (MAS) and in Westmeadows (MAE). These are shown on Figure 8.

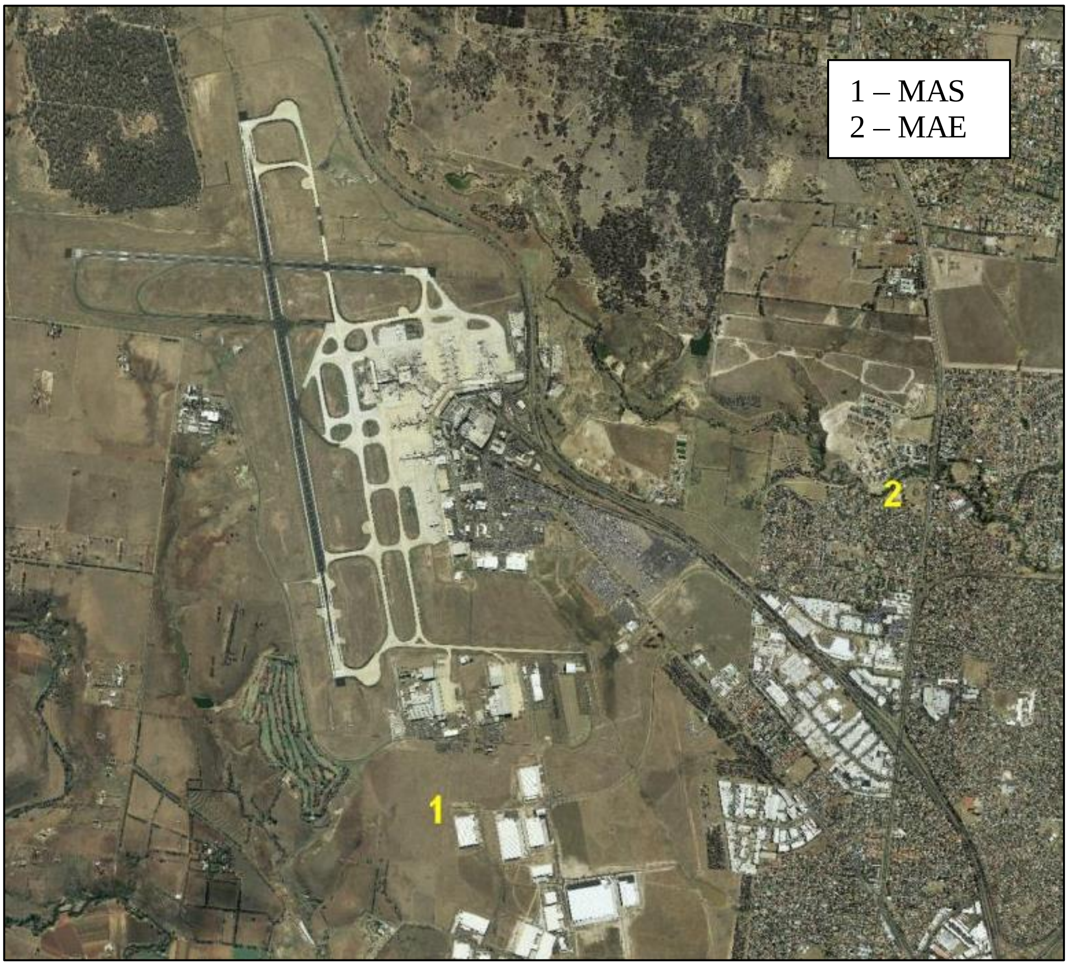


Figure 8: Melbourne Airport air quality monitoring stations

As shown in Table 6, data available from Melbourne Airport (2016-17) shows that air quality standards are met except for daily PM_{10} and $PM_{2.5}$ standards. PM_{10} is not monitored at MAE and as the MAE station was only in operation for three months prior to the end of the 2016-17 year, no annual average information is available.

Table 6: Air quality monitoring information for financial year 2016/2017

	Standard	MAS	MAE
NO_2			
Annual average	30 ppb	7.9	-
Maximum hourly mean	120 ppb	55	40
PM_{10}			
Annual average	20 µg/m^3	16.5	-
Maximum daily mean	50 µg/m^3	**51**	-
$PM_{2.5}$			
Annual average	8 µg/m^3	6.4	-
Maximum daily mean	25 µg/m^3	**25.1**	**25.5**

Note: Exceedances of the standards are highlighted as **bold**

One exceedance of the daily PM_{10} and $PM_{2.5}$ standard was recorded at each station over the year. These exceedances were marginal and within 2% of the standard. Elevated PM_{10} and $PM_{2.5}$ concentrations were also recorded for the same days at EPA operated air quality monitoring stations at Footscray and Alphington (13 kilometres south and 17 kilometres south-west of the airport respectively). This suggests that meteorological and air quality influences across the wider Melbourne area were the cause of the exceedance rather than activities associated with the airport.

Local air quality at Melbourne Airport is reasonably good compared with other locations in Melbourne. This is primarily due to its location, north-west of the metropolitan area, which is the area considered to contribute significantly to pollution in Melbourne including traffic sources. As noted the predominant wind direction is northerly, therefore the airport is not subject to dispersion of pollution from the metropolitan area for most of the year.

The Project is located on Melbourne Airport land, approximately 400 meters west of the closest residential area of Westmeadows. The closest hotels are approximately 500 meters north-east of the Project. Most receivers near the Project are transient (such as passengers using long-term car parks), and therefore are less sensitive to changes in local air quality as their exposure would be over a short period.

5.5.2 Assessment of Impacts

Existing or baseline ambient air quality refers to the concentration of relevant substances that are already present in the environment. These are present from various sources, such as industrial processes, commercial and domestic activities, traffic and natural sources.

A desk-based review of the Environment Protection Authority (EPA) Air Watch website and air quality monitoring reports available from Melbourne Airport has been carried out to determine baseline conditions of air quality in this assessment and to understand the risk of exceedance of the air quality standards shown in Table 5.

Local meteorology conditions have been determined using data from the Bureau of Meteorology (BoM) operated meteorological station at Melbourne Airport.

Potential local air quality impacts for the construction phase of the Project have been identified using professional judgement, based on experience from similar road construction projects. Operational impacts have been determined based on changes to traffic, including redistribution of traffic and increased traffic associated with growth of the airport.

There is the potential for dust generation associated with the construction of the Project, including the following activities:

- Earthworks
- Abutments for the elevated road
- Construction of the road
- Transport and handling of soils and materials
- Tie-ins to existing infrastructure.

While amenity impacts are limited due to the lack of sensitive receivers, dust soiling of vehicles located in the long-term car parks is a risk and would need to be minimised. Dust generation would occur temporarily and be exacerbated during dry and windy conditions, particularly on hot days. Potential impacts can be minimised through the implementation of best practice dust suppressant measures.

Exhaust emissions from construction plant, machinery and vehicles would also generate emissions that could impact on local air quality. Such emissions are associated with the combustion of fossil fuels during vehicle movement and the operation of on-site plant and construction machinery. It is expected that all construction vehicles, plant and machinery would be operated in accordance with the manufacturer’s guidelines and therefore associated emissions and air quality impacts would be negligible in the context of existing vehicular movements in the area.

There would also be the potential for odour associated with the construction of the road pavement, specifically during the application of asphalt and line-marking. Again, this would be temporary in nature and minimised through the implementation of safeguard measures, however given the lack of sensitive receivers no amenity impacts would be anticipated.

Given the temporary nature of works and lack of nearby sensitive receivers, any air quality impacts associated with construction activity are expected to be **low**.

The Project would provide direct access for vehicles from the Tullamarine Freeway to the existing elevated road and T4 ground transport hub, likely redistributing traffic which currently uses Mercer Drive or Terminal Drive to access the airport. As shown on the *Melbourne Airport Master Plan 2018*, the Project will ultimately form the main entrance to the airport elevated road network.

Traffic modelling data indicates that 2023 it is estimated the Project will carry approximately 5,000 vehicles per day. Initially this will just be to the T4 ground transport. These vehicles are likely to be redistributed from other internal Melbourne Airport rather than new journeys because of the Project (traffic accessing Terminals 1, 2 and 3 will continue to use Terminal Drive).

Traffic using an elevated road at approximately eight meters above ground level, would result in lower pollutant concentrations, in comparison to an at grade road. This is due to pollution having more opportunity to disperse from the source of pollution to the receiver at elevation (in comparison to at-grade where the public would likely be exposed).

Any changes to local air quality near the Project would be minimal for a low-level usage of 5,000 vehicles per day. Minimal traffic growth is anticipated between 2023 and the opening of the reconfigured forecourt in 2028 (discussed in Section 5.1). Following this, traffic using the Project is anticipated to significantly increase and is predicted to carry approximately 48,800 vehicles per day. This is due to some increased traffic associated with the growth of the airport, but primarily due to further redistribution of traffic around the airport via the proposed elevated road network (as discussed in Section 2).

A summary of the predicted traffic usage using the elevated road structure is summarised in Table 7.

Table 7: Predicted traffic usage of the elevated road structure

Year	Number of vehicles per day
With Project (2023)	4,700
With Project plus reconfigured T123 ground transport hub (elevated forecourt) (2028).	48,800

Growth at the airport, including increased traffic movement, is likely to result in a deterioration in air quality. This has the potential to affect the immediate surrounds of the airport.

It should be noted that the relationship between increased traffic and air quality impacts are not linear (for example, ten times more traffic does not result in a tenfold increase in pollutant concentrations). There are many factors which contribute to dispersion such as meteorology and topography. In addition, vehicle emissions are predicted to improve with time because of cleaner fuel technologies entering the vehicle fleet, so impacts are likely to differ in the short-term compared to the longer term when vehicle emissions are fewer. Notwithstanding this, impacts associated with a tenfold increase in traffic are likely to be obvious.

As noted above, the area immediately surrounding the Project does not include the receivers that are sensitive to changes in local air quality (e.g. young children, the elderly), therefore increased traffic on the Project itself is unlikely to affect public health or result in an exceedance of the standards.

Given the indiscernible impacts to air quality rising from the Projects development (namely the redistribution of traffic rather than generation), the lack of nearby sensitive receivers, any air quality impacts associated with operation of the Project are expected to be **low**.

5.5.3 Mitigation measures

Potential local air quality impacts because of the Project have been identified. The emissions are expected to result from fugitive dust and construction vehicles during the construction phase and traffic using the Project in the operational phase.

Construction phase impacts will be managed by implementing standard best practice to minimise dust generation and spread as well as minimising vehicle emissions where possible. This is central to reducing the risk of dust soiling of vehicles parked in the long-term airport car parks which are near the Project. This will be appropriately managed through an appropriate Construction Environment Management Plan (CEMP).

5.6 Noise

5.6.1 Baseline

A review of the baseline conditions has determined that sensitive receivers that may be impacted by road traffic noise associated with the Project include:

- Residential receivers in the order of 400 meters to the east of the Project
- Commercial hotel receivers in the order of 600 meters to the north west of the Project
- Commercial office receivers in the order of 400 meters to the west of the Project and 50 meters south of existing roads that may have significant increase in noise due to the Project.

5.6.2 Assessment of Impacts

The Project is required to meet the *VicRoads Traffic Noise Reduction Policy*[3] requirements for residential noise sensitive receivers based on 'limiting noise next to new or improved roads'. The Project is considered a new road based on the 'new alignment' and receivers that are exposed to new noise sources due to the Project.

There are no specific noise limits that must be met for hotel or office receivers that may be impacted by road traffic noise associated with the Project. The road traffic noise impact for these receivers has been assessed based on guidance from Australian Standards.

Indicative noise levels have been predicted based on year 2038 traffic estimates. The proposed road itself is not considered to increase traffic volumes overall however redistributes significant amounts of traffic to different roads within the Airport.

The following predicted year 2038 noise levels have been used to determine the noise impact on sensitive receivers:

Table 8: Predicted Year 2038 Noise Levels

Receiver	Noise Source	Noise Level (external)
Residential	Tullamarine Freeway	62 $dBL_{A10,\ 18hr}$
Residential	T4 Express Link (only)	50 $dBL_{A10,\ 18hr}$
Office	T4 Express Link/Grants Road	70 $dBL_{A10,\ 1hr\ (peak)}$
Hotel	T4 Express Link/Terminal Drive	62 $dBL_{A10,\ 1hr\ (peak)}$

[3] VicRoads, Traffic Noise Reduction Policy, 2005

The following noise impacts are based on the predicted noise levels in Table 8:

- Noise from the Project is not considered to be greater than noise from Tullamarine Freeway at residential locations
- Noise from the Project is predicted to meet VicRoads Traffic Noise Reduction Policy Requirements at residential locations
- Noise from the Project and increased traffic adjacent to office locations is expected to result in a noticeable increase in noise however is predicted to meet Australian Standards for open plan office spaces based on a standard 6/12/6 or 10-millimetre laminate glazed façade
- Noise from the Project is not considered to result in a noticeable increase in noise with regards to noise from other internal airport roads and the Tullamarine Freeway. Noise from the Project is predicted to meet Australian Standards for sleeping spaces (ie. hotels) based on a standard 6/12/6 or 10 millimetre laminate glazed façade.

The noise impacts of the Project are considered to be **low** as the expected impacts on receivers will meet the recommended guidelines and policy requirements.

5.6.3 Mitigation

Based on the above assessment, no specific noise mitigation is required or proposed.

5.7 Land Use and Tenure

5.7.1 Baseline

The Airport itself is located approximately 22 kilometres northwest of the city centre and is connected to Melbourne's freeway and arterial road network; allowing access via public and private vehicles. The site is near industrial areas including Tullamarine and Sunshine located to the south and Somerton and Campbellfield located to the east. Melbourne's residential growth corridors have also expanded to include development of Attwood and Westmeadows to the east and Hillside and Taylor's Hill to the west. This provides the Airport the opportunity to serve as a hub for the freight and logistics industry as well as capitalise on a growing labour market.

Currently Melbourne Airport is primarily accessed via the Tullamarine Freeway. The Tullamarine Freeway is widening at critical locations heading north past Essendon Airport, and north of the M80 Ring Road. The internal Melbourne Airport road system provides access across the airport lease, between the Tullamarine Freeway and a range of land uses that generate passenger, employee and commercial trips. Passenger trips are generally concentrated in the terminal precinct and car parking areas, where congestion in these areas during peak and shoulder periods can be experienced. Commercial trips are usually concentrated in the Melbourne Airport Business Park and commercial and mixed-use areas to the south of the terminal precinct. Employee trips are dispersed across the lease depending on employment.

To encourage strategic and complimentary land uses, several policies and plans as well as legislation are in place.

The Land Use Plan for Melbourne Airport, as included in the *Melbourne Airport Master Plan 2018*, demonstrates how airport land is currently used for a mix of airport functions and ancillary uses, including;

- airside facilities – runways, taxiways, aprons and air navigation facilities)
- terminal development
- non-aviation development
- infrastructure development -water, sewerage, stormwater drainage, electricity and other utilities
- airport roads and connections.

The Project falls into the Landside Main Precinct, which is situated to the east of the terminals. This is shown on Figure 9.

As discussed in Section 3.5, the Project is consistent with the objectives of the *Melbourne Airport Master Plan 2018.*

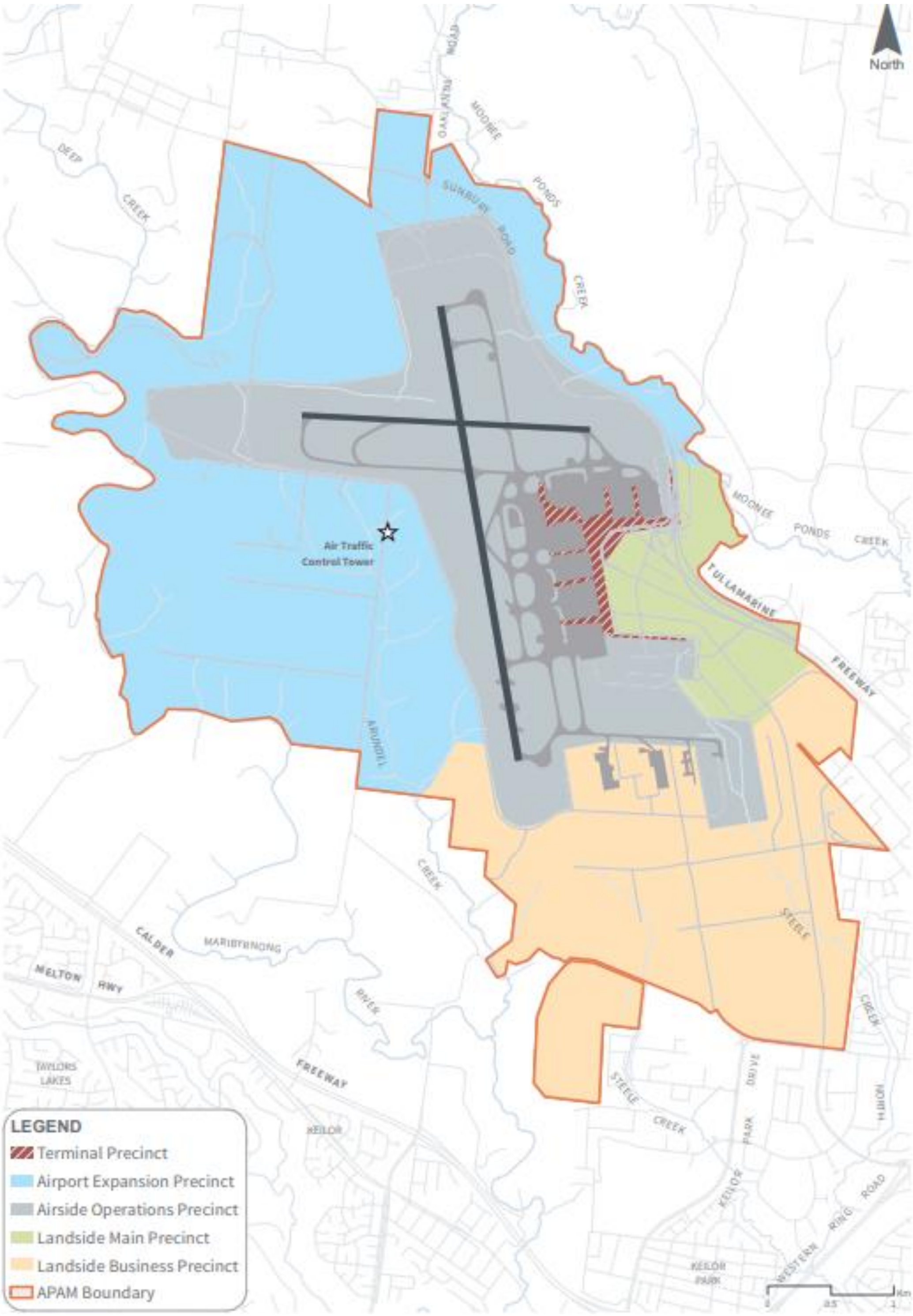


Figure 9: Melbourne Airport land use precincts (from Melbourne Airport Master Plan 2018)

While the provisions of state planning policy and local planning scheme do not apply to land covered by the *Airports Act 1996*, the Act requires an MDP to addresses any potential inconsistencies between the prevailing planning scheme in force, under a law of a State or Territory in which the airport is located. As such Victoria's principle land use plan and the Hume Planning Scheme have been considered in this MDP.

At a state level, Plan Melbourne 2017-2050 emphasises the need to keep up with the growing transport demands across the city. Plan Melbourne aims to secure the status of Melbourne's airport(s) as efficient gateways with capacity for moving passengers and freight into and out of Victoria, as well as supporting future employment and economic development opportunities.

Plan Melbourne highlights the competitive advantages of Melbourne Airport, namely its curfew-free international airport and the perceived benefits this, in conjunction with improved efficiency of the road network, can bring to the state of Victoria. This directly relates to the Project, and the broader vision of the airport elevated road network.

At a local level, land surrounding the airport is in the municipality of City of Hume and therefore subject to the provisions of the Hume Planning Scheme. As such the following Planning Policy Provision should to be considered in this MDP:

- Clause 11 – Settlement: aims to anticipate and respond to the needs of existing and future communities through provision of zoned and serviced land including employment, commercial and infrastructure. Furthermore, consideration planning should prevent environmental and amenity problems created by siting incompatible land uses close together.
- Clause 15 – Built Environment and Heritage: aims to ensure all land use and development appropriately responds to its surrounding landscape and character, valued built form and cultural context.
- Clause 17 – Economic Development: aims to provide for a strong and innovative economy, where all sectors are critical to economic prosperity, including industry, commercial and tourism
- Clause 18 – Transport: aims to ensure an integrated and sustainable transport system that provides access to social and economic opportunities, facilitates economic prosperity, contributes to environmental sustainability, coordinates reliable movements of people and goods, and is safe.
- Clause 19 – Infrastructure: aims to allow the logical and efficient provision and maintenance of infrastructure.

Hume's Municipal Strategic Statement further demonstrates key issues and influences facing Hume that should be taken into consideration These include:

- Urban Structure and Settlement
- Built Environment and Heritage
- Economic Development
- Transport Connectivity and Infrastructure

Hume City Council's municipal zones reflect the main use of parcels while the overlays ensure that important aspects of the land are recognised. By way of background, the planning zones used in the land use strategies in the *Melbourne Airport Master Plan 2018* have been derived from Victorian Planning Policy (VPP) provisions.

Hume Planning Scheme surrounding zones include:

- Green Wedge zone in the north and west
- Commercial and Industrial zone to the south and south east
- Public Conservation and Resource zone to the north east
- Road Zone, Category 1 (Tullamarine Freeway) to the east (and partially through the airport lease).

Hume Planning Scheme surrounding overlays include:

- Development Plan Overlay (Western Avenue Development Plan)
- Environmental Audit Overlay
- Melbourne Airport Environs Overlay (Schedule 2)
- Special Building Overlay.

The objectives of these zones and overlays are detailed in Table 9.

Table 9: Zone and Overlay objectives

Zone/Overlay	Objectives
Green Wedge	To protect green wedges of Melbourne from inappropriate development while also protecting major state infrastructure and resource assets, such as airports.
Commercial	To encourage development that meets the communities' needs for retail, entertainment, office and other commercial services and locate commercial facilities in existing or planned activity centres
Industrial	To facilitate the sustainable development and operation of industry and protect state significant industrial precincts from incompatible land uses (including Campbellfield, Somerton and Thomastown)
Public Conservation and Resources	To protect and conserve the natural environment and natural processes for their historic, scientific, landscape, habitat or cultural values.
Road	To identify significant existing roads and identify land which has been acquired for a significant proposed road.
Development Plan (Western Avenue Development Plan)	No use or development of land can commence, until a Development Plan showing the overall use and development of all land affected by this clause has been prepared to the satisfaction of the responsible authority.
Environmental Audit Overlay	To ensure that potentially contaminated land is suitable for a use which could be significantly adversely affected by any contamination.
Melbourne Airport Environs Overlay (Schedule 2)	To identify areas that are or will be subject to moderate levels of aircraft noise based on the 20-25 Australian Noise Exposure Forecast (ANEF) contours and to limit use and development to that which is appropriate to that level of exposure.

Zone/Overlay	Objectives
Special Building Overlay	To identify land in urban areas liable to inundation by overland flows

Melbourne Airport was owned and operated by the Commonwealth Government until 1997, when Commonwealth airports were privatised. APAM acquired the lease for Melbourne Airport in July 1997, operating under a 50-year long-term lease from the Commonwealth Government, with an option for a further 49 years.

The Commonwealth Government retains ownership of the site and has responsibility for control over land-use planning and development on airport land, including all leased land, under the provisions of the *Airports Act 1996*.

5.7.2 Assessment of Impacts

All Melbourne Airport development has a responsibility to comply with relevant Commonwealth legislation and State where appropriate. As discussed in Section 3.6, the provisions of the Victoria *Planning and Environment Act 1987* do not apply to airport land, however under the *Airports Act 1996*, Melbourne Airport is required to give consideration to and address any inconsistencies between an MDP and state and local legislation.

Any impacts to land use arising during construction are expected to be temporary, such as the use of land in the long-term carpark for construction laydown and stockpiling of materials. These impacts are appropriately mitigated through the availability of long-term car parking elsewhere on the airport estate in close proximity. As such the expected construction impacts to land use are **low**.

With regards to land tenure, the Project has been prepared with consideration of the interests that existed at the time the airport lease was created. This included easements, licenses, leases and sub-leases. There are no perceived conflicts or inconsistencies between these interests. During construction however, there will be large sections of the long-term carpark occupied by construction activity. This may be perceived as an issue for operators of the long-term carpark who will potentially seek claim for loss of earning during construction. As such the impact to land tenure is **moderate**.

An assessment of the Project has been undertaken against the objectives of the Melbourne Airport Land Use Plan, as included in the *Melbourne Airport Master Plan 2018*, the State land use plan (Plan Melbourne) and the Hume Planning Scheme. This assessment has determined that the Project is generally consistent with the objectives of the land use planning policy relevant to the Project and therefore will have a **low beneficial** impact on land use planning at Melbourne Airport. This is considered on the basis that the project facilitates the ultimate planning outcomes of these planning documents. Table 10 provides a breakdown of this assessment.

The impact from the Project on land tenure is expected to be minor, resulting from the loss of approximately 300 car parking bays in the long-term carpark. As stated previously, this is expected to be mitigated through the availability of car parking elsewhere nearby and therefore considered to have a **low** impact.

Table 10: Assessment of relevant policy objectives against Project

Policy	**Project Response**
Melbourne Airport Master Plan 2013 *Melbourne Airport Master Plan 2018*	
The objectives of the Airport Land Use Plan in the *Melbourne Airport Master Plan 2013* are to: • facilitate land use and development in accordance with the ***Melbourne Airport Master Plan 2018*** • advance Melbourne Airport as one of the state's key activity centres • provide for the airport's long-term growth requirements • support a range of uses, including complementary business and shopping activities, employment, travellers' accommodation, leisure, transport and community facilities • support sustainable urban outcomes that optimise the use of infrastructure • create an attractive, pleasant, safe, secure and stimulating environment through good urban design • support good environmental practice to minimise the impact on the environment and protect environmentally sensitive heritage areas.	The Project meets the requirements of the *Melbourne Airport Master Plan 2018* as it provides the foundations for the elevated road network which will: • meet projected demand (supported by traffic modelling in Section 5.1), highlighting the need for the proposed Project; • separate road access to terminals and thus improve safety and reducing congestion allowing passengers and staff to efficiently access the Airport; • further integrate the airport's ground transport network into the wider local and state-wide road network, enhancing the airport's long-term viability and accessibility. • improve the road network, ensuring ongoing access for private transport, shuttles, taxis, and emergency services. • Ensure the additional capacity within the internal road network will provide opportunity for diversity in transport modes across other parts of the airport including dedicated bus lanes within the current road system and overall improving private and public vehicle transport movement.
Plan Melbourne	
Under Plan Melbourne, Melbourne Airport is identified as a transport gateway. The purpose of a Transport Gateway is:	Transport Gateways such as Melbourne Airport are recognised as places where complementary uses and employment-generating activities are encouraged. The

<table>
<tr><th>Policy</th><th>Project Response</th></tr>
<tr><td>"To secure adequate gateway capacity for moving passengers and freight in and out of Victoria and support future employment opportunities at major ports, airports and interstate terminals. They will be protected from incompatible land uses but adjacent complementary uses and employment-generating activity will be encouraged."</td><td>Project is complimentary to these activities, ensuring the safe and efficient movement of passengers, employers and services to and from Melbourne Airport.

Due to its proximity to Melbourne's freeway network, the airport is well serviced in terms of high-capacity road access. However, given high travel demand of the airport, congestion is a regular problem on both the internal and external road network during peak periods.

The proposed design aims to support the development of a long-term solution which addresses congestion in the peak periods and details opportunities to increase the efficient vehicle movement, passenger access to the airport and to manage travel demand through infrastructure solutions.

This significant investment in Melbourne Airport's internal road network is supportive of Plan Melbourne and the objective relevant to transport gateways.</td></tr>
<tr><td colspan="2">Hume Planning Scheme</td></tr>
<tr><td>Provisions of the Hume Planning Scheme applicable to the Project include:
Clause 11 – Settlement: aims to anticipate and respond to the needs of existing and future communities through provision of zoned and serviced land including employment, commercial and infrastructure. Furthermore, consideration planning should prevent environmental and amenity problems created by siting incompatible land uses close together
Clause 15 – Built Environment and Heritage: aims to ensure all land use and development appropriately responds to its surrounding landscape and character, valued built form and cultural context
Clause 17 – Economic Development: aims to provide for a strong and innovative economy, where all sectors are critical to economic prosperity, including industry, commercial and tourism</td><td>The Project meets the requirements of the Hume Planning Scheme as it:
Anticipates the need for future access to the airport given the expected increase in activity.
Appropriately locates infrastructure at distance, in an already disturbed environment, reducing any impact on the natural environment or causing any additional amenity issues. Further, appropriate measures such as a robust CEMP during construction will reduce any further impacts to the surrounding environment or amenity.
Provides new access to the airport, benefiting airport users as well as the surrounding commercial and industrial areas as the Project will ultimately help minimise traffic congestion across the broader road network. This</td></tr>
</table>

Policy	Project Response
• Clause 18 – Transport: aims to ensure an integrated and sustainable transport system that provides access to social and economic opportunities, facilitates economic prosperity, contributes to environmental sustainability, coordinates reliable movements of people and goods, and is safe • Clause 19 – Infrastructure: aims to allow the logical and efficient provision and maintenance of infrastructure Note: The Project is considered to be consistent with the zones and overlays of the Planning Scheme due to the imbedded nature of the zones into the Master Plan land use plan.	should result in economic benefits for freight and commercial vehicles accessing adjoining industrial estates as less congestion is assumed. • Non-aviation development plays a vital role in Melbourne Airport's economic vitality and complements its key functions. This integral piece of road infrastructure will assist in increasing the capacity of the internal and external road network and reduce travel times. Reliable and efficient transport links between Melbourne Airport, the CBD and the metropolitan area are critical to ensure there are appropriate levels of access to the state's major airport. This could have far reaching effects across the adjoining and surrounding road networks. Furthermore, design will aim to ensure pedestrian safety during drop-off and pick-up. The specific developments proposed in the *Melbourne Airport Master Plan 2018* are supportive of the plans, policies and legislation and are unlikely to conflict with surrounding Hume Planning Scheme. • Supporting Melbourne through the provision of critical ancillary airport infrastructure, ensuring greater and more reliable transport connectivity between Melbourne and Melbourne Airport. The Project is to be undertaken on a logical staged basis, ensuring the timely delivery of infrastructure when it is required.

5.7.3 Mitigation Measures

No mitigation measures for land use and planning are proposed. This is due to the minimal impact the proposed Project will have on current and future land use and the Project's consistency with planning documentation.

Ongoing refinement of the connections to the existing underlying roads, ground transport hubs and forecourts are likely, and these changes occur, impacts associated with the Project may be reassessed as a result. This will ensure any impacts will be identified and managed as far as practicable during the design stage.

5.8 Economic and Social

5.8.1 Baseline

In 2018, Deloitte Access Economics was commissioned by the Australian Airports Association to undertake an assessment of the economic and social contribution of Australia's Airports. This report, *The economic and social contribution of Australia's airports* (Deloitte Access Economics, 2018[4]) determined that Australia relies on an efficient and reliable aviation sector and airport network allowing for both the movement of people and freight domestically and internationally.

This report is relevant to this MDP as the Project adds capacity to the existing landside road system in the face of increasing travel demands.

In relation to the economic contribution of the aviation sector, the report identified several findings, including:

- In 2011, Australia's airports generated a total economic contribution of approximately $34.6 billion or 2% of Australia's Gross Domestic Product (GDP). In Victoria, the *Melbourne Airport Master Plan 2018* identifies the 2015-16 economic contribution of Melbourne Airport to Victoria as $17.6 Billion (or 7% of state GDP).
- The Deloitte report identifies the aviation industry as a significant employer across Australia, identifying jobs in core airport operations, airport precincts, the aviation industry and domestic tourism industry. The 2018 Master Plan identifies the airport precinct as an anchor employer in Victoria directly supporting more than 20,600 FTE jobs, directly and indirectly supporting a further 150,000 jobs across Victoria in various sectors. Employment within the airport precinct is projected to increase to 35,000 jobs by 2038. This projected growth is stronger than state-wide and national averages.
- The report identifies the role major airports play in Australia's logistics network, with the volume of international air freight carried increasing by an average of 3% annually over the last decade (from 755,000 tonnes in 2006-07 to over 1 million tonnes in 2016-17). International air freight makes up nearly 21% of freight by value and in 2011-12 this was worth over $110 billion. In 2016-17 Melbourne Airport handled 277,000 tonnes of international air freight worth $16 billion, on top of 186,000 tonnes of domestic air freight.

From a social perspective, it was noted that airports and aviation:

- Play an important social role in connecting individuals, families, and communities with each other, the rest of the country and world;
- Provide vital services, such as the facilitation of main, time sensitive deliveries and the Royal Flying Doctors;

[4] Deloitte: Access Economics (2018), Connecting Australia: The economic and social contribution of Australia's airports – Australian Airports Association 2018.

- Facilitate the provision of workers to their place of employment in remote locations across Australia;
- Provide training facilities for high value employment; and
- Are increasingly engaged and an assert in their community.

To keep pace with this economic growth, constant upgrades are required to the landside access of Melbourne Airport. Without the Project, the existing road system will be challenged to maintain current levels of service. This is due to both the initial additional network capacity the Project provides as well as the facilitation of future projects, namely the elevated forecourt.

5.8.2 Assessment of Impacts

During construction, temporary employment opportunities will be generated for construction staff and building contractors to support the Project. As previously noted, the cost of construction for the Project is anticipated to be greater than $40 million. While it is unknown how many construction workers will be on site at any given time, the employment opportunity would be a beneficial impact resulting from the Project regardless, during construction.

While the construction of the Project is subject to detailed design, it is envisaged the impacts to the broader transport network at the airport would be minimal. This is due to the Project being capable of being constructed offline, allowing the existing road network to remain operational throughout construction. This reduces potential impacts on employees, visitors and services accessing the airport.

Social amenity impacts may arise during construction from dust, however any impacts associated with this are expected to be minimal as discussed in Section 5.5 and capable of being appropriately managed through the application of a robust CEMP.

The economic impacts of the Project during construction are expected to be **low**, as the Project will be constructed offline and have minimal impact on the airport road network. Any impacts to the long-term car park are mitigated through the ready availability of long-term parking elsewhere. While the impacts on social amenity, arising from construction elements such as dust impacts, are expected to be effectively managed through a robust CEMP.

The economic and social impacts of the Project during operation, particularly in terms of the 2038 elevated road network (with the elevated forecourt) are overall beneficial. The Project will provide greater access to the airport for employees, visitors and services. In the immediate, the Project will redistribute traffic from Mercer Driver, separating passenger vehicles and freight and service vehicles. Therefore, the operational impact is considered **low beneficial**.

5.8.3 Mitigation Measures

During construction, general measures will be employed as part of the CEMP to reduce any potential impacts on amenity. This will incorporate the general principles of minimizing amenity impacts, such as through dust suppression, and include measures to address other potential environmental impacts.

No mitigation measures are proposed during operation of the Project as the impacts on economic and social aspects would be beneficial.

5.9 Landscape and Visual

5.9.1 Baseline

The landscape and visual amenity of the airport is influenced by the existing topography, drainage, vegetation cover and land use. A summary of these key components is provided below.

Topography and Drainage

- The broader airport environment is characterised by its low lying, flat topography, with the terrain declining towards Maribyrnong River and Arundel Creek to the east and Yuroke Creek to the west.
- A number of drainage tributaries traverse broadly in an east west direction, including Arundel Creek, Deep Creek, Broad St Drain, Moonee Ponds Creek and Steel Creek.
- The topography of the long-term car park where the Project is located is generally flat, sloping toward the Steel Creek North drain to the south west.

Vegetation cover

- The vegetation cover beyond the airport environment largely consists of open grassland with intermittent scattered trees along the creek lines.
- The existing north-south runway is marked at the northern extent by mature vegetation to the east and west, including an area of Grey Box woodland to the west and Woodlands Historic Park to the east. The southern extent is marked by Melbourne Airport Golf Course.
- Mature vegetation lines the southern edge of Tullamarine Freeway and occupies the space between Terminal Drive, Tullamarine Freeway and Western Avenue.
- No vegetation is present within the long-term car park where the Project is located.

Land use

- The airport environment predominantly includes aviation infrastructure, including aviation services, car parks, airside operations, passenger and freight terminals, terminal support infrastructure, maintenance and cargo area, with commercial development to the south.
- The residential area of Tullamarine occupies the eastern boundary in areas. Buffer screen planting frequently bounds the western edge of residential development, particularly to the east of Airport Drive. Further north, Westmeadows residential area is situated to the east of Tullamarine Freeway, with the western edge of the residential area experiencing views across gently rolling agricultural land.

5.9.2 Impact Assessment

The Project will involve the construction of an elevated road bridge and associated approach roads from Tullamarine Freeway north bound to Airport Drive. It is assumed that the proposed structure will be approximately 12 meters above ground level between Apac Drive and the existing elevated road. As illustrated in Figure 2, the bridge and approach roads will be approximately 1.1 kilometres in length.

While the construction methodology is unknown at this stage, it is assumed that the construction phase elements that have the potential to alter the visual amenity include:

- Clearance of vegetation along the southern boundary of the Tullamarine Freeway, including mature trees that bound the long-term car park
- Earthworks and transportation of materials
- Lighting during night time construction works
- Closure of sections of the long-term car park

The operational phase that have the potential to alter the visual amenity include:

- The Project itself, namely the road structure stretching above the existing long-term car park
- Additional road infrastructure within a heavily urbanised environment

The proposed works will be situated within an environment dominated by road and aviation infrastructure, including the long-term car park to the south and Tullamarine Freeway and Western Avenue to the north. This existing environment is judged to have the capacity to absorb this type of change, although it is anticipated to result in an increment enlargement of the existing heavily urbanised environment.

To the east and beyond the immediate environment, there is the potential for visual impacts to extend to the western edge of the Westmeadows residential area. It is anticipated that the proposed vegetation clearance and additional infrastructure would be evident in these views, however they would be in the context of the existing freeway reservation and Apac Drive freeway overpass/onramp.

In terms of landscape and visual amenity sensitive receptors, the Holiday Inn and Park Royal are situated to the west of the Project. It is anticipated that hotel staff and visitors would experience east elevation views to the Project, however these views would be experience in the context of existing road and car park infrastructure.

As such, due to the highly disturbed and heavily urbanised character of the airport area, namely the long-term car park and physical separation from sensitive receivers, the Project is expected to have a **low** impact on landscape and visual amenity during construction and operation.

5.9.3 Mitigation

While the Project is not expected to have a significant impact on landscape and visual amenity, there are a few potential landscape and visual mitigation measures that will be incorporated into design, where possible, to help avoid, minimise and manage any potential impacts that may arise.

Landscape and urban design treatments for consideration in detailed design include:

- Reinstatement of mature vegetation removed during construction
- Mitigate potential adverse visual effects using a combination of planting, walls and/or earth mounds to reduce or filter views towards the proposed infrastructure
- Appropriate design of bridges, approach roads and retaining walls to contribute to defining the T4 Express Link as an airport arrival point. In addition, consider how the infrastructure forms part of a wider network and sequence of events as part of arrival point
- Planting of vegetation, in accordance with any APAM landscaping guideline or policy.

5.10 Cultural Heritage

5.10.1 Baseline

There are many considerations when determining cultural heritage significance at Melbourne Airport. The *Melbourne Airport Master Plan 2018* clearly demonstrates the significance of cultural heritage in defining the airports identify as a place within the community.

According to a study undertaken by Biosis, previous archaeological investigations across the Melbourne Airport APAM land have indicated the high archaeological significance of the area with a total of 89 Aboriginal places and 17 historic places identified and recorded within airport land. Many of these recorded places are centred along Maribyrnong River, Moonee Ponds Creek, Deep Creek, Glenara Creek and other waterways and have been found to retain cultural material in disturbed and *in situ* deposits illustrating that intact landforms remain.

The Project area is mainly located on West Victorian Dissected Uplands geomorphic land system, however the northern most extent of the Project area is underlain by Undulating Plains of the Western District geomorphic land system. Moonee Ponds Creek is the closest major waterway to the Project area and is approximately 800 meters at its closest point. Steele Creek is a major tributary of the Maribyrnong River, and is located approximately 800 meters south west of the Project area.

The Biosis report prepared in 2018 states that despite the importance of Moonee Ponds Creek as a resource for Aboriginal people prior to European settlement, disturbance of the land associated with residential and industrial development is likely to have significantly diminished its archaeological value. This being echoed for many of the greater Melbourne waterways and flood plains which have experienced disturbance and reduced ground surface visibility, which limits the discovery of Aboriginal archaeological sites. However, despite this urbanization, waterways of the metropolitan area remain sensitive for the presence of archaeological deposits.

Cultural Heritage Management Plan (13446) was undertaken in 2015 for the CTW project (Melrose Drive to Apac Drive). This CHMP activity area includes the Project footprint within the freeway reservation. While works within the freeway reservation are not subject to this MDP (ie. the Project stub which is already under construction by VicRoads), this CHMP found that there were 13 recorded VAHR places within 500 meters of the assessment boundary of this portion of the CTW project. These places are recorded in areas that would not otherwise be defined by the Regulations as areas of cultural heritage sensitivity, with none of them located directly on (or adjacent) to land associated with the Project.

Further investigations undertaken in 2003, as documented in the Biosis report, were undertaken on an area of land between Airport Drive and the Tullamarine Freeway, close to the Project. During the survey, three previously unrecorded Aboriginal cultural heritage sites were identified (VAHR Sites 7822/1445 to 7822-1447, isolated artefacts and an artefact scatter). Testing found that the ground at these sites had suffered significant disturbance from previous land use and concluded that there was little potential for further significant archaeological deposits to be located at either site.

Previous reports conducted along the Tullamarine Freeway road reserve and M80 corridor have generally demonstrated that the freeway corridor has been subject to intensive landscape modification during road-building activities in the past, alluding to an insignificant presence of cultural heritage within the freeway landscape.

The closest Aboriginal place (listed on the VAHR) to the Project is the Moonee Ponds Creek Escarpment. This place consists of an isolated flaked stone artefact, located within a highly disturbed, contaminated fill soils. This artefact is approximately 850 meters north of the Project (to the east of the Tullamarine Freeway), adjacent to the Moonee Ponds Creek. The artefact is not considered to be in situ and has likely come from elsewhere on APAM land where the stockpiled soil has been removed. This artefact is considered a low significance due to its common occurrence and the disturbed / deteriorated nature of the landscape in which it is found. In addition, due to the location of the Project there is no significant risk to the Moonee Ponds Creek escarpment.

To summarise, there are no historic archaeological or aboriginal cultural artefacts or places located within the site footprint of the Project.

5.10.2 Assessment of Impacts

Provisions for assessing and protecting both Aboriginal and historic heritage on Commonwealth land falls to the *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act).

The cultural heritage gaps assessment prepared by Biosis has determined that the Project footprint is not within in an area of cultural heritage sensitivity. Additionally, CHMP 13446 has determined that there are no known Aboriginal Places (VAHR) in the Project footprint. Assessments undertaken in the preparation of these documents has determined that it is unlikely harm to cultural heritage will occur because of the Projects construction.

Given the previous extent of disturbance at the site, it is unlikely that subsurface cultural heritage material will be encountered near the surface. As such the potential impact to Indigenous heritage during construction has been assessed as **low**, as there is no previously identified Indigenous heritage identified within the Project area.

Additionally, there is no previously identified historic (non-indigenous) archaeological values within the Project footprint, so this impact has been assessed as **negligible**.

There will be **negligible** impacts to heritage during operation.

5.10.3 Mitigation Measures

Although the likelihood of encountering heritage items at the site is low, if works encounter any suspected aboriginal cultural heritage deposits, works are required to cease and the APAM Environment Manager and Airport Environment Officer are to be informed immediately. This must be followed, in writing by the contractor detailing any materials resembling Indigenous artefacts or human skeletal remains that may have been identified during construction. This is consistent with the requirements of the *Airports (Environment Protection) Regulations 1997* and will be included within the Projects CEMP.

5.11 Hazardous Goods

5.11.1 Baseline

Effective control and management of hazardous goods is required in accordance with the *Work Health and Safety Act 2011*. This sets out the requirements to protect the health and safety of workers as well as protection of property and the environment.

There are several procedures in place to manage and store dangerous and hazardous goods. There are also several procedures in place for managing spill kits and specifying safety procedures and environmental precautions to be exercised during response to spills to mitigate any potential environmental impact from the hazardous goods.

5.11.2 Assessment of Impacts

During the construction phase the Contractor will be responsible for any licenses required under the *Work Health and Safety Act 2011* for the storage of hazardous goods at the site. Hazardous goods that may be present at the site during the construction phase include:

- Waste oils from machinery or plant equipment;
- Waste paint products; and
- Small quantities of fuel for machinery.

If present on site, these goods will be handled, stored and disposed of in accordance with the Act. The impact of hazardous goods during construction has been assessed as **low**.

During operation, there will be no additional types of hazardous goods outside of those already present on the site. Hazardous goods will continue to be handled and stored in accordance with Airservices procedures and regular automatic monitoring of the new systems will be undertaken. The impact of hazardous goods during operation has therefore been assessed as **negligible**.

5.11.3 Mitigation Measures

During construction, measures for the management of hazardous goods will be specified in the CEMP, including:

- Establishment of a dangerous goods storage area, with appropriate bunding, for any hazardous goods required during the construction phase;
- Storage and handling of dangerous goods in accordance with the *Work Health and Safety Act 2011*;
- Any waste oils, fuels or other hazardous wastes will be collected and transported to a designated disposal site as soon as possible; and
- A spill control plan and emergency procedures will be implemented as part of the CEMP.

5.12 Aviation Operations and Safety

The National Airports Safeguarding Framework (NASF) and Civil Aviation and Safety Authority (CASA) Guidelines should also be considered in relation to the relevant aspects outlined in Table 11.

Table 11: Considerations for aviation operations and safety

Consideration	Guidelines	Relevance to the Project
Aircraft Noise	NASF – Guideline A: Measures for Managing Impacts of Aircraft Noise	Not considered as part of this assessment as the Project would not impact on aircraft numbers and/or associated noise.
Wind Shear	NASF – Guideline B: Managing the Risk of Building Generated Windshear and Turbulence at Airports	Not considered as part of this assessment as the Project would not impact on wind shear close to the Airport and/or runway.
Wildlife Strikes	NASF – Guideline C: Managing the Risk of Wildlife Strikes in the Vicinity of Airports	Considered in Section 5.12.5
Wind Turbine Farms	NASF – Guideline D: Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation	Wind turbine farm impacts have not been considered as part of this assessment as wind turbines are not part of the Project.
Lighting and Reflection	NASF – Guideline E: Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports	Considered in Section 5.12.3
Protected Airspace	NASF – Guideline F: Managing the Risk of Intrusions into the Protected Airspace of Airports	Considered in Section 5.12.1
Security of Communication, Navigation and Surveillance facilities	NASF – Guidelines G: Communication, Navigation and Surveillance (CNS)	Communication, Navigation and Surveillance facilities are located in the AirServices Australia compound, located in the airport airside precinct. The Project does not impact on these facilities.
Development of Helicopter Landing Sites	NASF – Guidelines H Protecting Strategically Important Helicopter Landing Sites	Helicopter landing sites are restricted to the airside precinct of Melbourne Airport and therefore will not be impacted by the project.
Public Safety Areas	NASF – Guidelines I Managing the Risk in Public Safety Areas at the Ends of Runways	While the project is located outside the Public Safety Area of both existing and proposed runways at Melbourne Airport, the

Consideration	Guidelines	Relevance to the Project
		project is considered to be a compatible use within both the 1 in 100,000 and 1 in 10,000 public safety areas at the end of runways.
Plume Rise	CASC – CASA Advisory Circular AC 139-5(1): Plume Rise Assessments	Considered in Section 5.12.2
Air navigation and radar systems	PSPF, ISM and Air Services Act 1995	Not considered as part of this assessment as the Project is not located within the vicinity of the Air Traffic Control (ATC) Tower.
Sight lines	PSPF, ISM and Air Services Act 1995	Not considered as part of this assessment as the Project would not impact on sightlines due to the distance from the airport runway.

5.12.1 Protected Airspace

5.12.1.1 Obstacle Limitation Surface

Obstacle Limitation Surfaces (OLS) are a series of surfaces that set the height limits of objects around an aerodrome. Objects that project through the OLS become obstacles. OLS are prescribed to ensure the safe obstruction-free operation of aircraft in the protected airspace in the vicinity of airports. Building heights and the height of other fixed objects are limited so that they do not intrude into the airspace defined by the OLS.

Ground level is approximately 118 meters AHD and the OLS is 157 meters AHD at the site. This is well above the proposed height of the elevated road, which is expected to have a maximum height of 12 meters (as per the existing elevated road). The road will therefore not intrude into the OLS.

During construction, it is likely that equipment including cranes will be used, however these are not expected to protrude into the OLS. If it is identified during detailed design that temporary infringement of the OLS is required, Melbourne Airport will work with Airservices and seek the appropriate internal and external approvals from CASA under the *Airports (Protection of Airspace) Regulations 1996*.

Impact to the OLS during construction and operation is negligible.

5.12.1.2 Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS) Surface

PANS-OPS surfaces are established to protect aircraft operating under instrument flight rules which requires a greater margin of error than the OLS. Consequently, the PANS-OPS surface are generally higher than the OLS. At the site, the PANS-OPS surface is approximately 170 meters AHD.

As the development will be well below the OLS, therefore there will be no impact on PANS-OPS. If it is identified during detailed design that temporary infringement of the PANS-OPS is required, Melbourne Airport will work with Airservices and seek the appropriate internal and external approvals from CASA, under the *Airports (Protection of Airspace) Regulations 1996*.

The impact of the Project on the protected airspace has been assessed as negligible during construction and operation.

5.12.2 Plume Rise and Dust Emissions

Aircraft operations may be affected by an exhaust plume of significant vertical velocity and CASA has identified that there is a need to assess the potential hazard to aviation posed by vertical exhaust plumes more than 4.3 metres per second (m/s) velocity. This would generally relate to plumes generated from industrial facilities with vents or stacks. However, the Project will not produce any exhaust plumes, so this impact is negligible to the Project.

During construction, there are likely to be minor dust emissions due to ground disturbance and movement of vehicles at the site. Dust generation during construction will be managed through measures in the Construction Environmental Management Plan (CEMP) and are not likely to pose a risk to aircraft. No dust is expected to be generated during operation.

The potential impacts from plume rise and dust emissions have been assessed as negligible during construction and operation.

5.12.3 Advanced-Surface Movement Guidance and Control System (A-SMGCS)

Through consultation with AirServices Australia concern has been raised that the Project may have an impact on the Advanced-Surface Movement Guidance and Control System (A-SMGCS) coverage of Taxiway Whiskey, which may have subsequent impacts on future ground control operations.

Although there will be no impact to the current operational management of aircraft on the ground, there may be impacts in the future, such as those associated with the proposed Runway Development Program.

Initial investigations between APAM and AirServices Australia has determined that any impact to A-SMGCS associated with the Project are capable of being mitigated through the relocation or upgrades of receiver units and does not require alteration to the design of the Project.

5.12.4 Lighting

Lighting near Airports has the potential to distract pilots therefore it is important that it is configured appropriately to avoid this risk. Under Regulations 94 of the

Civil Aviation Regulations 1988 (CAR 1988). CASA can require lights which may cause confusion, distraction or glare to pilots in the air, to be extinguished or modified. Reference has been made to the *National Airports Safeguarding Framework, Guideline E – Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports,* which provides guidance for the installation of lighting within 6 kilometres of an aerodrome (from the centre point of each runway). Within this large area there exists a primary area which is divided into four light control zones: A, B, C and D. These zones reflect the degree of interference ground lights can cause as a pilot approaches to land.

The Project is located on the boundary of Zone B and C with respect to the proposed third runway centre-line, however the lighting design will comply with Australian Standards and requirements of APAM, CASA and AirServices. External lighting will be designed to not emit upward waste light. This will include consideration of factors such as light intensity, light colours and no light spill above the horizontal. Similarly, any lighting required during construction will be configured to comply with requirements and minimize the risk of light distraction to pilots.

The potential impacts from lighting during construction and operation of the Project has been assessed as negligible.

5.12.5 Wildlife Strike

Wildlife, particularly bird strikes are known to cause significant damage to aircraft if collisions occur. Any bird is a potential hazard to aircraft, with the hazard increasing with the size of individual birds and the presence / size of flocks of birds. The number of wildlife strikes and the attendant risk of fatalities, injuries, aircraft damage and operational delays can be reduced by managing land use around airports to minimize the potential for wildlife to conflict with aircraft operations.

Most wildlife strikes occur on and near airports, where aircraft fly at lower elevations. The risk of a strike on airport relates to the level and form of wildlife activity. Wildlife attracted to land uses around airports can mitigate onto the airport or across flight paths, increasing the risk of strikes.

During construction, the CEMP will outline procedures to keep the site clean and limit stockpiles. Further, species selection in accordance with the Melbourne Airport Planting Guidelines will avoid bird-attracting species and mitigate the risk of bird strike during operation. In addition, the proposed development is located approximately 1.9 kilometre from the runway, meaning that wildlife associated with this development is unlikely to cause significant impact to operations.

The potential impact of the Project on wildlife strike is therefore negligible during the construction and operation of the Project.

Overall the project is considered to have a **negligible** impact on aviation operations and safety during construction and operation.

6 Summary of Impacts

This environmental assessment component of the MDP has been undertaken to meet the requirements of Section 91 (1) (h) of the *Airports Act 1996*. Table 12 provides a summary of the potential environmental and social impacts considered in the assessment.

Overall the project is considered to have a low impact on the environment during construction and operation.

The benefits the project will ultimately deliver to the way passengers and workers access Melbourne Airport will far outweigh the potential impacts outlined in this assessment.

Table 12: Summary of environmental and social impact

Section	Environmental and social factors	Impacts	
		Construction	Operation
5.1	Traffic	Low	Low beneficial
5.2	Soils and Land Contamination	Low	Negligible
	Groundwater Contamination	Negligible	Negligible
5.3	Surface Water and Drainage	Low	Low
5.4	Ecology	Negligible	Negligible
5.5	Air Quality	Low	Low
5.6	Noise	Low	Low
5.7	Land Use	Low	Low beneficial
	Tenure	Moderate	Low
5.8	Economic and Social	Low	Low beneficial
5.9	Landscape	Low	Low
5.10	Cultural Heritage	Negligible	Negligible
5.11	Hazardous Goods	Low	Negligible
5.12	Aviation Operations and Safety	Negligible	Negligible

7 Environmental Management

7.1 Environmental Policy

APAM has an Environmental Policy that requires proactive work with business partners and other stakeholders to implement defined environmental management principles. The Environmental Policy generally includes working with business partners and other stakeholders to comply with all environmental laws, policies, and procedures and where possible exceed these requirements.

Details of how the objectives would be achieved are provided in the Environmental Management System and general priorities include integrating social and environmental considerations into decision making and conserving natural resources.

7.2 Environmental Strategy

As discussed in Section 3.4, the 2018 Environment Strategy provides a framework for environmental management at Melbourne Airport and represents a commitment to mitigate environmental impacts. All development within the Melbourne Airport precinct must comply with and meet the relevant objectives and those most relevant to the Project are outlined in Table 13.

Table 13: Environment Strategy objectives

Topic	Key objectives
Environmental Management	To maintain and continue to improve environmental management, monitoring, reporting and certifications
Waste and Resource Management	Reduce waste disposal to landfill by APAM managed facilities
Water Quality – Stormwater	Improve stormwater quality to achieve leading-edge standards
Water Quality – Groundwater	To protect groundwater quality at Melbourne Airport
Biodiversity and Conservation Management	Conserve and actively manage biodiversity values at Melbourne Airport to improve the quality and condition of native vegetation and fauna habitats
Cultural Heritage	To ensure Indigenous and non-Indigenous historical cultural heritage sites are protected at Melbourne Airport in accordance with Commonwealth and State legislative requirements
Land Management	To undertake all reasonable and practical measures to ensure land is managed appropriately and contamination is avoided at Melbourne Airport

Topic	Key objectives
Hazardous Materials	To ensure all hazardous products are stored, handled, used and disposed of in compliance with Commonwealth and State requirements

7.3 Environmental Management Procedures

Melbourne Airport maintain a comprehensive Environmental Management System which has been certified and audited against the International Standard for Environmental Management Systems (ISO14001:2015). As part of this and the Environmental Strategy there is a range of established systems and processes in place which need to be adhered to during the construction and operation of the Project.

7.3.1 Construction Environmental Management Plan

All construction activities that have the potential to cause environmental harm within the airport boundaries require a CEMP to be submitted and approved by the Melbourne Airport Environment Department and the Airport Environment Officer. This will identify measures to protect the environment and comply with legislation and regulation for construction activities.

The CEMP for the Project will cover all aspects of construction for the Project and where appropriate include a monitoring, reporting and auditing system to be used throughout the Project by contractors. The CEMP will be submitted to and approved by the Melbourne Airport Environment Department and the AEO in accordance with the Conditions for Approval from the Minister for the Project, which may include for example, monitoring of noise, designated construction hours and types of plant and equipment to be used. Regular audits will also be undertaken to ensure compliance with the approved CEMP, including the provisions within the SMP.

8 Consultation and Approval Process

8.1 Consultation Objectives

Melbourne Airport has a commitment to proactive community consultation and stakeholder engagement. This commitment is underpinned by a desire for Melbourne Airport to be positioned within the community as a responsible corporate citizen and meeting the requirements under the Airports Act for community consultation.

Melbourne Airport is a member of the International Association of Public Participation Australasia and our approach to engagement is underpinned by the IAP2 Core values.

In undertaking this project our consultation objectives are to:

- Increase the awareness of the project and the work Melbourne Airport is undertaking to manage growth;
- Inform key stakeholders about the project and how they can make a submission;
- Identify issues and concerns with the project and involve key stakeholders to develop appropriate management strategies; and
- Enhance the connection and understanding that stakeholders and community groups have with Melbourne Airport.

8.2 Consultation Strategy

8.2.1 Consultation during MPD development

In the preparation of this Preliminary Draft MDP, APAM has been consulting with VicRoads as part of the Project's development since June 2018, through a series of meetings, presentations and provision of technical memos.

A summary of the meetings held is provided below:

- 19 June 2018 – T4 connector and master plan brief
- 21 August 2018 – Modelling discussion for MDP
- 17 October 2018 – Alignment Option Discussion
- 07 November 2018 – Traffic Modelling Preliminary Discussion
- 05 December 2018 – Stage 1 Base Traffic Model Approach
- 19 December 2018 – VicRoads Stage 1 Base Traffic Model Result Presentation
- 5 February 2019 – Regional Review Committee (RRC) meeting
- 27 February 2019 – Project Review Committee (PRC) endorsement

As part of the Exposure Draft process, the following stakeholders have been engaged with:

- Transport for Victoria (Vic)
  - Rail Projects Victoria (RPV)
  - Freight Victoria
- Department of Environment, Land, Water and Planning (Vic)
- CASA
- Air Services Australia
- Department of Environment and Energy (Cth)
- Department of Infrastructure, Transport, Cities and Regional Development (previously Department of Infrastructure, Regional Development and Cities) (Cth).

8.2.2 Statutory Consultation Requirements

Section 92 of the Airports Act specifies:

(2A) The consultation period is:

(a) a period of 60 business days after the publication of the notice; or

(b) a shorter period (of not less than 15 business days after the publication of the notice) that is approved by the Minister.

(2B) The Minister may, by written notice, approve the shortening of the consultation period if the Minister:

(a) is requested in writing to do so by:

(i) the airport-lessee company; or

(ii) another person with the written consent of the airport-lessee company; and

(b) is satisfied that:

(i) the draft major development plan aligns with the details of the proposed development set out in the final master plan; and

(ii) the proposed development does not raise any issues that have a significant impact on the local or regional community.

8.2.3 Non-Statutory Consultation

In accordance with the Airports Act, APAM has advertised the consultation period for this MDP in the following publications:

- The Age
- Brimbank Star Weekly

- Melton Star Weekly

Melbourne Airport has also advertised this consultation period on the Melbourne Airport website (www.melbourneairport.com.au) and Melbourne Airport's dedicated community consultation website My Melbourne Airport at my.melbourneairport.com

Melbourne Airport has also published this notification in our regular email update, and directly via correspondence to relevant Ministers, Departments and Local Governments in accordance with the Airports Act.

8.2.4 Engagement opportunities

During the public exhibition period Melbourne Airport will undertake a range of activities to engage with stakeholders and the community on this project. These will include:

- The offer of direct briefings with interested government members, agencies and regulators;
- Community members will be able to attend a Melbourne Airport Community Forum to be held in Taylor's Lakes on March 30th, 2019;
- Regular 'Hot Desk' opportunities in the areas surrounding Melbourne Airport (these are advertised in local papers and via email to registered subscribers)
- Briefings of advisory groups to Melbourne Airport including the Planning Coordination Forum and the Community Aviation Consultation Group.

The My Melbourne Airport online engagement hub also provides interested parties with the ability to make submissions, download documents or ask questions in a moderated Q&A forum.

8.2.5 Supplementary Report

The *T4 Express Elevated Road Supplementary Report* has been prepared, detailing the consultation activities undertaken during the preparation and public display of this MDP. It should be read in conjunction with this document.

9 References

Airservices Australia and Australia Pacific Airports (Melbourne) Pry Ltd (2015) Melbourne Airport - Air Traffic Services Centre Modernisation (Extension) and Equipment Room Project Preliminary Draft Major Development Plan.

Arup (2013), Landside Movement Feasibility Study and Report

Arup (2018), Melbourne Airport, T4 Express Link MDP Traffic Assessment

Aurecon (2019), Melbourne Airport Elevated Road Traffic Engineering Review of Designs PRC Report for VicRoads

Australia Pacific Airports (Melbourne) Pty Ltd (2019) Melbourne Airport Master Plan 2018

Australia Pacific Airports (Melbourne) Pty Ltd (2013) Melbourne Airport Master Plan

Biosis (2018), Heritage Gaps Study

Biosis (2018), Melbourne Airport Ecology Gaps Study

Dr Vincent Clark and Associates (2015), CityLink-Tulla Widening Melrose Drive, Airport West – Apac Drive, Melbourne Airport

Commonwealth Scientific and Industrial Research Organisation (CSIRO) (1999) Urban stormwater best practice environmental management guidelines

Senversa (2018), Preliminary Soil Contamination Assessment, T4 Elevated Road, Melbourne Airport

Appendix A

Airports Act MDP Checklist

This Appendix indicates the requirements under Section 91 of the *Airports Act 1996* for the contents of an MDP and demonstrates that this Draft MDP is consistent with these requirements.

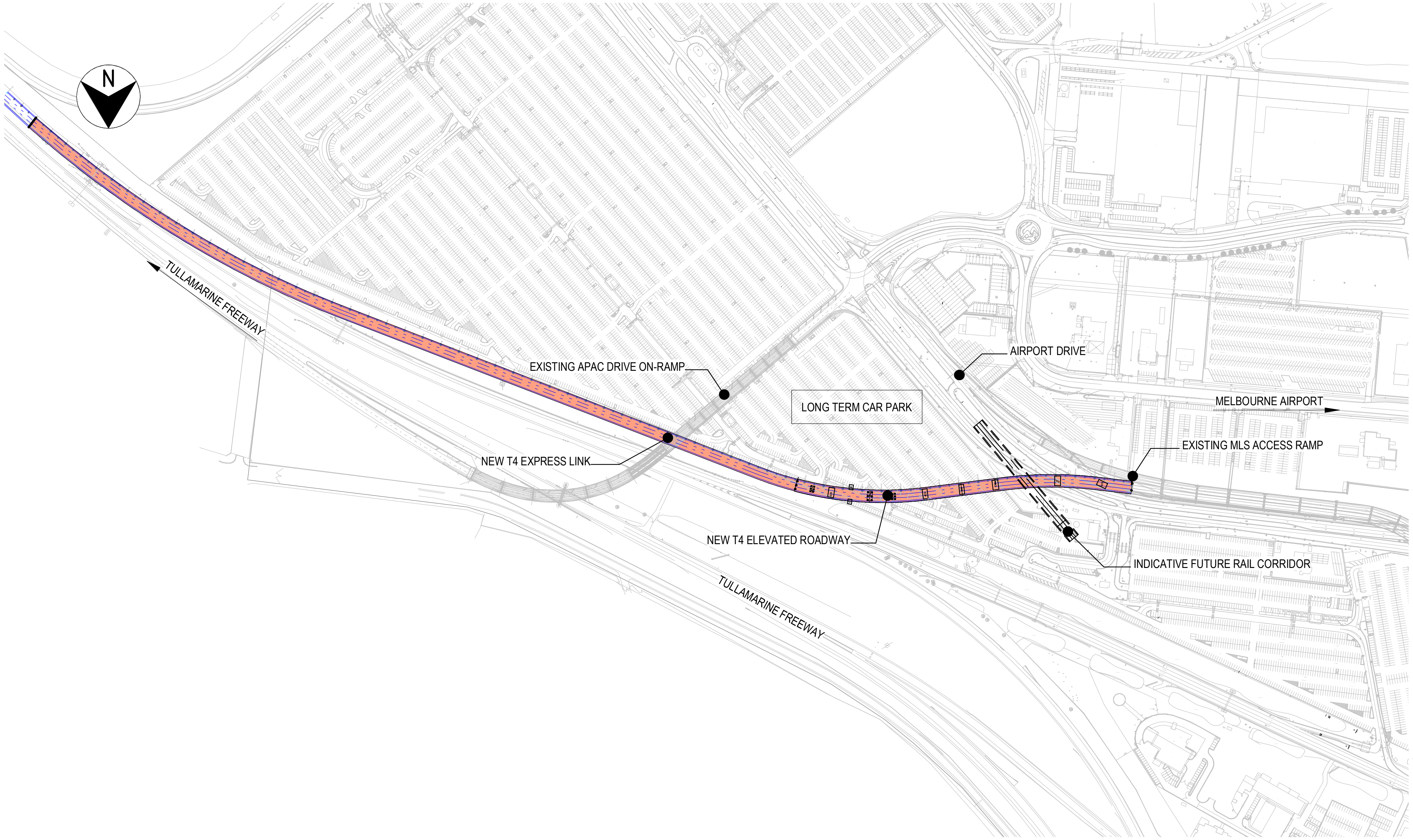
Section 91 Contents of a Major Development Plan	Relevant Section of this MDP
(1) A major development plan, or a draft of such a plan, must set out: (a) the airport lessee company's objectives for the development; and	Section 2.2
(b) the airport lessee company's assessment of the extent to which the future needs of civil aviation users of the airport, and other users of the airport, will be met by the development; and	Section 2.2
(c) a detailed outline of the development; and	Section 2.4
(ca) whether or not the development is consistent with the airport lease for the airport; and	Section 3.4 and Section 5.6
(d) if a final master plan for the airport is in force, whether or not the development is consistent with the final master plan; and	Section 3.5
(e) if the development could effect noise exposure levels at the airport - the effect that the development would be likely to have on those levels; and	Section 5.5
(ea) if the development could affect flight paths at the airport - the effect that the development would be likely to have on those flight paths; and	Section 5.13
(f) the airport-lessee company's plans, developed following consultations with the airlines that use the airport, local government bodies in the vicinity of the airport and--if the airport is a joint user airport--the Department of Defence, for managing aircraft noise intrusion in areas forecast to be subject to exposure above the significant ANEF levels; and	Not applicable to this development
(g) an outline of the approvals that the airport-lessee company, or any other person, has sought, is seeking or proposes to seek under Division 5 or Part 12 in respect of elements of the development; and	Section 3.7
(ga) the likely effect of the proposed developments that are set out in the major development plan, or the draft of the major development plan, on: (i) traffic flows at the airport and surrounding the airport; and (ii) employment levels at the airport; and (iii) the local and regional economy and community, including an analysis of how the proposed developments fit within the local planning schemes for commercial and retail development in the adjacent area; and	(i) Section 5.11 (ii) Section 5.7 (iii) Section 3.6
h) the airport-lessee company's assessment of the environmental impacts that might reasonably be expected to be associated with the development; and	Section 5 and summarised in Section 7

Section 91 Contents of a Major Development Plan	Relevant Section of this MDP
(j) the airport-lessee company's plans for dealing with the environmental impacts mentioned in paragraph (h) (including plans for ameliorating or preventing environmental impacts); and	Section 5 and Section 8
(k) if the plan relates to a sensitive development—the exceptional circumstances that the airport-lessee company claims will justify the development of the sensitive development at the airport; and	Not applicable
(l) such other matters (if any) as are specified in the regulations.	Not applicable
(3) The regulations may provide that, in specifying a particular objective, assessment, outline or other matter covered by subsection (1), a major development plan, or a draft of such a plan, must address such things as are specified in the regulations.	See Regulation 5.04 below
(4) In specifying a particular objective or proposal covered by paragraph (1)(a), (c) or (ga), a major development plan, or a draft of a major development plan, must address: (a) the extent (if any) of consistency with planning schemes in force under a law of the State in which the airport is located; and (b) if the major development plan is not consistent with those planning schemes—the justification for the inconsistencies.	(a) Section 3.6.1 (b) Not applicable
(6) In developing plans referred to in paragraph (l)(f), an airport-lessee company must have regard to Australian Standard AS2021—1994 ("Acoustics—Aircraft noise intrusion—Building siting and construction") as in force or existing at that time.	Section 5.5
Regulation 5.04 For subsection 91 (3) of the Act, a major development plan must address the obligations of the airport-lessee company as sublessor under any sublease of the airport site concerned, and the rights of the sublessee under any such sublease, including: (a) any obligation that has passed to the relevant airport-lessee company under subsection 22 (2) of the Act or subsection 26 (2) of the Transitional Act; or (b) any interest to which the relevant airport lease is subject under subsection 22 (3) of the Act, or subsection 26 (3) of the Transitional Act.	Section 3.3

Appendix B

Detailed Design Drawings

CP16007/01 T4 EXPRESS LINK
STRUCTURAL DRAWINGS
LOCALITY PLAN



SITE OF WORKS

FUTURE RAIL CORRIDOR

SCALE 1:5000

Filename: BIM 360://503992 - CP 16007-01 Elevated Road/503992 - CP 16007-01 Elevated Road.rvt

Office:

Plot Date: 1/30/2019 8:46:22 AM

aurecon
www.aurecongroup.com

CLIENT: MELBOURNE AIRPORT

REV	DATE	REVISION DETAILS	APPROVED
A	30.01.19	DETAILED DESIGN	

SCALE	SIZE
As indicated	A3

DRAWN: M.A. ABDUL HABIB

DESIGNED:

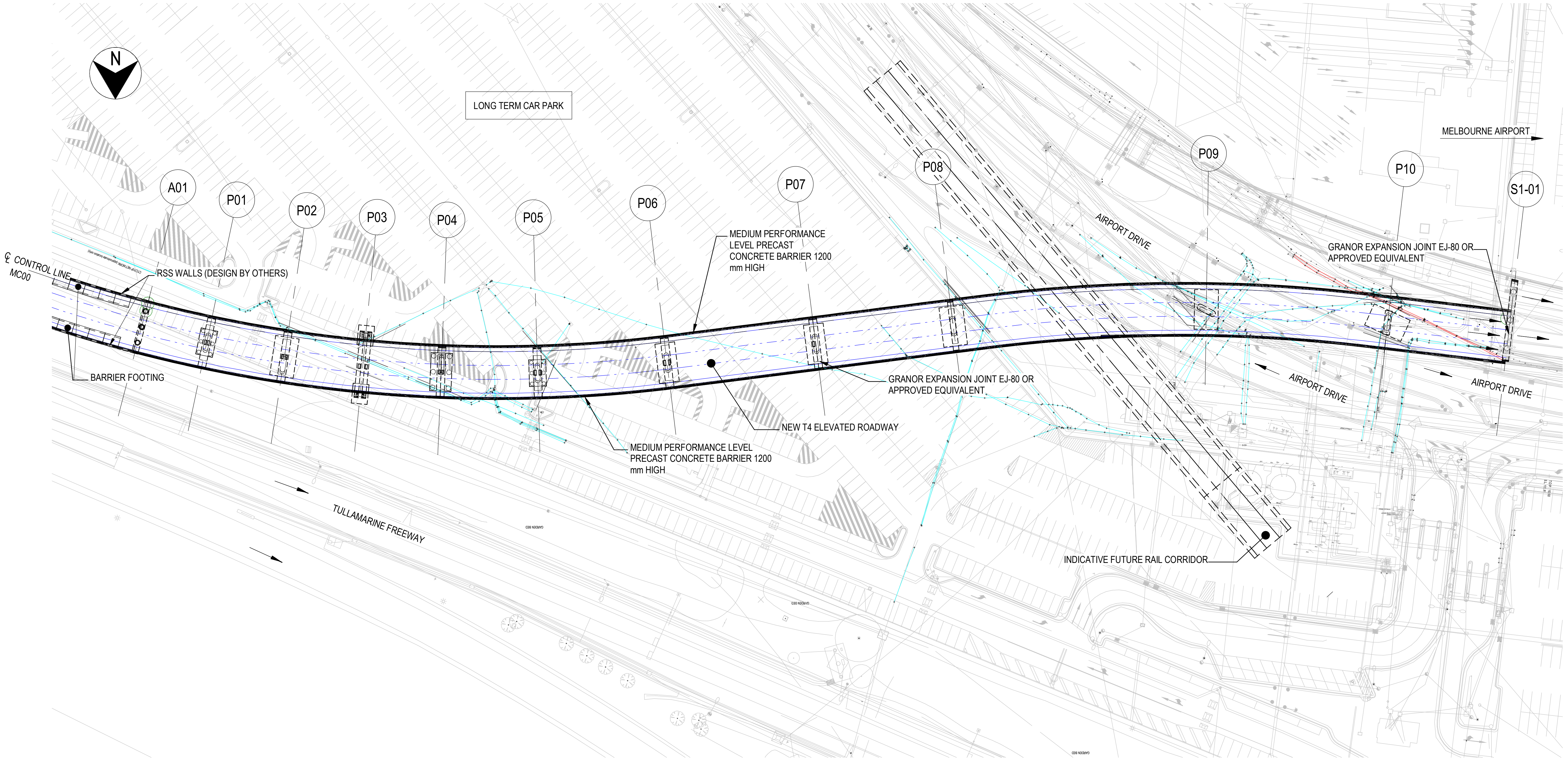
CHECKED: J.C. KOTZE

APPROVED: DATE

PROJECT: MELBOURNE AIRPORT CP16007/01 T4 EXPRESS LINK

TITLE: STRUCTURAL DESIGN PACKAGE COVER SHEET

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	503992	0001	DRG	SS	2001	A



PLAN
SCALE 1 : 1000

LEGEND

- NEW PROJECT ZONE
- FUTURE RAIL CORRIDOR
- FIBRE OPTIC CABLES (TELSTRA CABLE - WILL NOT BE RELOCATED)
- EXISTING SERVICES (TO BE RELOCATED WHERE REQUIRED) REFER TO SERVICES RELOCATION PACKAGE 503992-0001-UT

1:1000 0 10 20 30 40 50m
10

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DIAL BEFORE YOU DIG www.1100.com.au

NOTES

1. FOR GENERAL NOTES REFER TO DRAWING No. 503992-0001-DRG-SS-2100 TO 503992-0001-DRG-SS-2104
2. THIS DRAWING SHOWS APPROXIMATE LOCATION OF EXISTING SERVICES. FOR DETAILS OF SERVICE RELOCATIONS, REFER TO CP16007/01 T4 EXPRESS LINK UTILITIES RELOCATION DESIGN PACKAGE.

Filename: BIM 360://503992 - CP 16007-01 Elevated Road/503992 - CP 16007-01 Elevated Road.rvt
Office:
Plot Date: 1/30/2019 8:40:36 AM

aurecon
www.aurecongroup.com

CLIENT: MELBOURNE AIRPORT

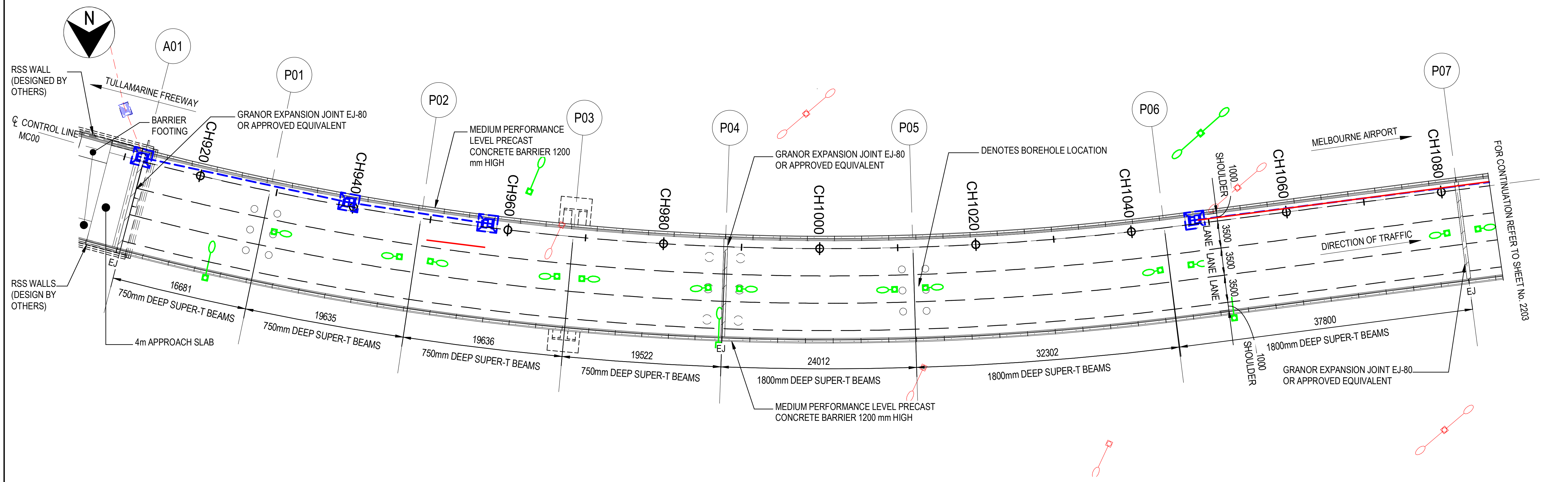
REV	DATE	REVISION DETAILS	APPROVED
A	30.01.19	DETAILED DESIGN	

SCALE	SIZE
As indicated	A3

DRAWN: M.A. ABDUL HABIB
DESIGNED:
CHECKED: J.C. KOTZE
APPROVED: DATE

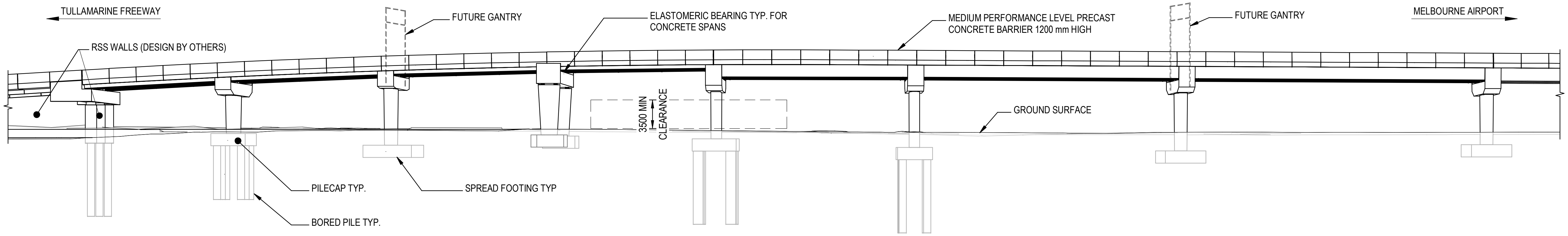
PROJECT: MELBOURNE AIRPORT CP16007/01 T4 EXPRESS LINK
TITLE: STRUCTURAL DESIGN PACKAGE GENERAL ARRANGEMENT OVERALL PLAN AND ELEVATION

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	503992	0001	DRG	SS	2201	A



PLAN

SCALE 1 : 500



ELEVATION

SCALE 1 : 500

LEGEND

- (solid blue line) PVC DRAINAGE PIPE AND INLET DRAIN. REFER TO CIVIL PACKAGE 503992-0001-RR
- (dashed blue line) STEEL DRAINAGE PIPE. REFER TO CIVIL PACKAGE 503992-0001-RR
- (green line) LIGHT POLES. REFER TO CIVIL PACKAGE 503992-0001-RR

1:500 0 5 10 15 20 25m

NOTES

1. FOR GENERAL NOTES REFER TO DRAWING No. 503992-0001-DRG-SS-2100 TO 503992-0001-DRG-SS-2104
2. FOR GENERAL ARRANGEMENT DESIGN LOADING NOTES REFER TO DRAWING No. 503992-0001-DRG-SS-2100
3. SERVICES NOT SHOWN FOR CLARITY. REFER TO DRAWING SS-2201 FOR LOCATION OF EXISTING SERVICES.
4. * ESTIMATED DEPTH OF HW OR BETTER ROCK BELOW EXISTING GROUND LEVEL IS BASED ON BOREHOLE. IF ROCK IS NOT ENCOUNTERED, EXCAVATE AND REPLACE WITH MIN 25 MPa MASS CONCRETE
5. GEOTECHNICAL ENGINEER SURVEY TO VERIFY THE ROCK CONDITION. MINIMUM REQUIRED ALLOWABLE BEARING CAPACITY 1000 kPa.
6. ** DENOTES DIMENSION PERPENDICULAR TO ROAD.

Filename: BIM 360://503992 - CP 16007-01 Elevated Road/503992 - CP 16007-01 Elevated Road.rvt
Office:
Plot Date: 1/29/2019 7:39:24 PM

aurecon
www.aurecongroup.com

CLIENT: MELBOURNE AIRPORT

REV	DATE	REVISION DETAILS	APPROVED
A	30.01.19	DETAILED DESIGN	

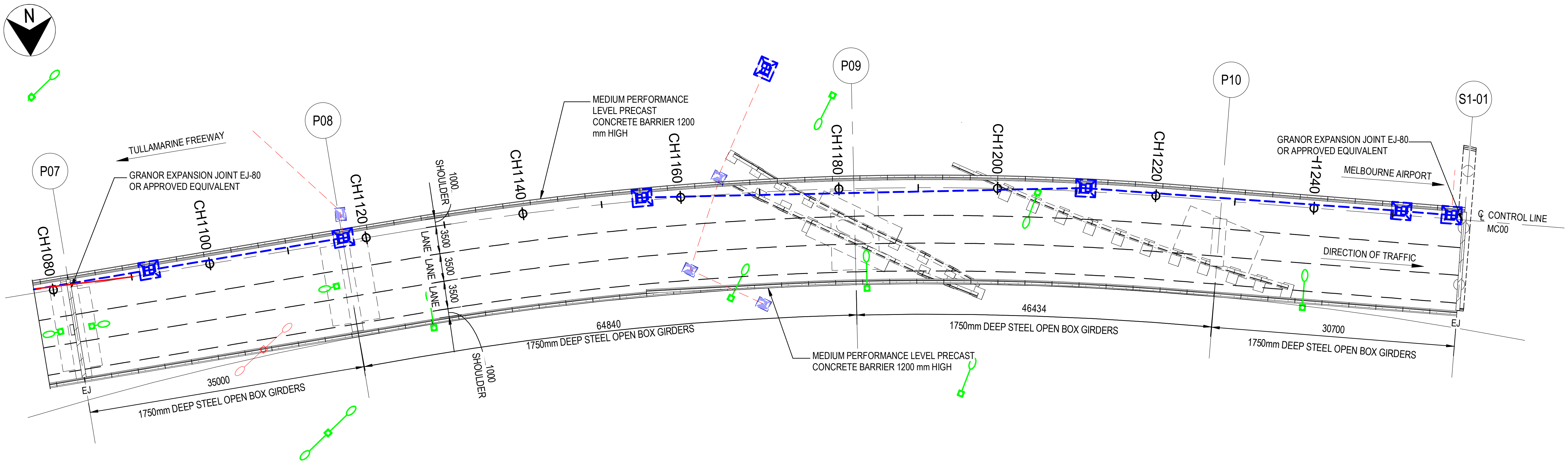
SCALE	SIZE
As indicated	A3

DRAWN: M.A. ABDUL HABIB
DESIGNED:
CHECKED: J.C. KOTZE
APPROVED: DATE

PROJECT: MELBOURNE AIRPORT CP16007/01 T4 EXPRESS LINK

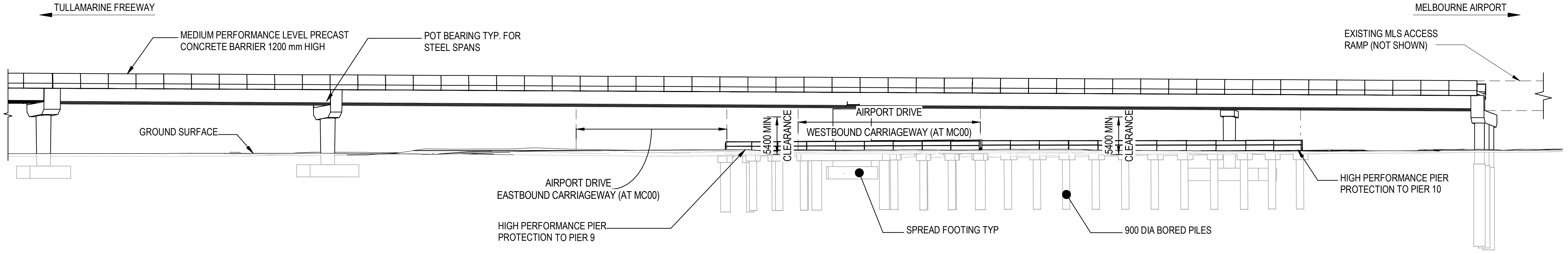
TITLE: STRUCTURAL DESIGN PACKAGE GENERAL ARRANGEMENT PLAN AND ELEVATION -SHEET 1

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	503992	0001	DRG	SS	2202	A



PLAN

SCALE 1 : 500



ELEVATION

SCALE 1 : 500

LEGEND

PVC DRAINAGE PIPE AND INLET DRAIN. REFER TO CIVIL PACKAGE 503992-0001-RR

STEEL DRAINAGE PIPE. REFER TO CIVIL PACKAGE 503992-0001-RR

LIGHT POLES. REFER TO CIVIL PACKAGE 503992-0001-RR

1:500 0 5 10 15 20 25m

NOTES

1. FOR GENERAL NOTES REFER TO DRAWING No. 503992-0001-DRG-SS-2100 TO 503992-0001-DRG-SS-2104
2. FOR GENERAL ARRANGEMENT DESIGN LOADING NOTES REFER TO DRAWING No. 503992-0001-DRG-SS-2100
3. SERVICES NOT SHOWN FOR CLARITY. REFER TO DRAWING SS-2201 FOR LOCATION OF EXISTING SERVICES.
4. * ESTIMATED DEPTH OF HW OR BETTER ROCK BELOW EXISTING GROUND LEVEL IS BASED ON BOREHOLE. IF ROCK IS NOT ENCOUNTERED, EXCAVATE AND REPLACE WITH MIN 25 MPa MASS CONCRETE
5. GEOTECHNICAL ENGINEER SURVEY TO VERIFY THE ROCK CONDITION. MINIMUM REQUIRED ALLOWABLE BEARING CAPACITY 1000 kPa.
6. ** DENOTES DIMENSION PERPENDICULAR TO ROAD.

DIAL BEFORE YOU DIG www.1100.com.au

Filename: BIM 360://503992 - CP 16007-01 Elevated Road/503992 - CP 16007-01 Elevated Road.rvt

Office:

Plot Date: 1/29/2019 7:39:31 PM

aurecon www.aurecongroup.com

CLIENT: MELBOURNE AIRPORT

REV	DATE	REVISION DETAILS	APPROVED
A	30.01.19	DETAILED DESIGN	

SCALE	SIZE
As indicated	A3

DRAWN: M.A. ABDUL HABIB

DESIGNED:

CHECKED: J.C. KOTZE

APPROVED: DATE

PROJECT: MELBOURNE AIRPORT CP16007/01 T4 EXPRESS LINK

TITLE: STRUCTURAL DESIGN PACKAGE GENERAL ARRANGEMENT PLAN AND ELEVATION - SHEET 2

DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
	503992	0001	DRG	SS	2203	A

Appendix C

Preliminary Soil Contamination Assessment

Preliminary Soil Contamination Assessment

T4 Elevated Road, Melbourne Airport

Prepared for:
Arup
Level 17 1 Nicholson Street
East Melbourne VIC 3002

8 August 2018

Distribution

Preliminary Contamination Assessment,
T4 Elevated Road MDP, Melbourne Airport

8 August 2018

Copies	Recipient	Copies	Recipient
1 PDF	**Jordan Green** Senior Planner | Environment and Resources Arup Level 17 1 Nicholson Street East Melbourne VIC 3002 Jordan.green@arup.com	1 PDF	**Senversa Project File**

1 **Reliance** - This document has been prepared solely for the use of Arup. No responsibility or liability is accepted for any damages arising out of the use of this document by any third party.

2 **Copyright and Intellectual Property** – No portion of this document may be removed, extracted, copied, electronically stored or disseminated in any form without the prior written permission of Senversa. Intellectual property in relation to the methodology undertaken during the creation of this document remains the property of Senversa.

3 **Principles and Limitations of Investigation -** This document is issued subject to the technical principles, limitations and assumptions provided in **Section 5.0**.

4 **Confidentiality** – This report was prepared for Arup and may contain confidential information. If you receive this report in error, please contact Senversa and we will arrange collection of this document.

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

Project Manager	**Sam O'Connor** Project Environmental Scientist	**Project Director**	**Richard Griffin** Principal Environmental Consultant

Contents

List of Acronyms iii

1.0 Introduction 1

1.1 Background 1

1.2 Objectives 1

2.0 Scope of Works and Methodology 2

2.1 Relevant Guidelines and Standards 2

2.2 Scope of Works 2

2.3 Quality Assurance / Quality Control (QA/QC) 3

3.0 Results and Findings 4

3.1 Generalised Soil Profile 4

3.2 Laboratory Results 4

3.3 Health Risk to Construction Worker 4

3.4 Soil Waste Management during Construction 5

4.0 Conclusions and Recommendations 6

5.0 Principles and Limitations of Investigation 7

5.1 Inherent Uncertainties and Limitations 7

5.2 Project Specific Uncertainties 8

6.0 References 9

Figures

Figure 1: Investigation Locations

Figure 2: Nature and Extent of Impacts (Fill Soils)

Tables

Table 1: Soil Analytical Results vs. Health Investigation Levels

Table 2: Soil Analytical Results vs. IWRG Threshold Limits

Table 3: Soil Leachability Results vs. IWRG Threshold Limits

Table 4: PFAS Analytical Results vs. Screening Criteria for Disposal

Table 5: PFAS Leachability Results vs. Screening Criteria for Disposal

Appendix A: Quality Assurance / Quality Control

Appendix B: Lithology Logs

Appendix C: Photographs

Appendix D: Laboratory Certificates

List of Acronyms

Acronym	Definition
AS	Australian Standard
BTEX	Benzene, toluene, ethylbenzene, xylenes
COC	Chain of custody
EPA	Environment Protection Authority (Victoria)
HEPA	The Heads of EPAs Australia and New Zealand
HIL	Health-based investigation level
HSL	Health screening level
IWRG	Industrial Waste Resource Guidelines
MAH	Monocyclic aromatic hydrocarbon
MDP	Major Development Plan
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
OCP	Organochlorine Pesticides
PAH	Polycyclic aromatic hydrocarbons
PCB	Polychlorinated Biphenyl
PFAS	per- and poly-fluoroalkyl substances
PFOS	Perfluorooctanesulfonic acid
PID	Photo-ionisation detector
QA	Quality assurance
QC	Quality control
RPD	Relative percentage difference
SVOC	Semi-volatile organic compound
TRH	Total recoverable petroleum hydrocarbons
USEPA	United States Environment Protection Agency
VOC	Volatile organic compound
WA DER	Government of Western Australia, Department of Environment Regulation

1.0 Introduction

Senversa Pty Ltd (Senversa) was engaged by Arup Pty Ltd (Arup) to undertake a Preliminary Soil Contamination Assessment (PSCA) for the proposed T4 Express Elevated Road project at Melbourne Airport (the site). **Figure 1** illustrates the location of the investigation area.

1.1 Background

Senversa understands that Arup has been engaged to complete early concept designs and prepare a Major Development Plan (MDP) submission for the proposed T4 Express Elevated Road project. As part of these works, preliminary soil contamination assessment works were requested to gain an understanding of the soil contamination status along the proposed alignment to support the MDP submission.

The project comprises the construction of a new elevated road than links from the Tullamarine Freeway, through the Long-term Car Park to Terminal 4 of Melbourne Airport. The exiting lane from the Tullamarine Freeway will be constructed by VicRoads and the elevated road on federal airport land will be commissioned and constructed by Melbourne Airport. The elevated road will comprise a dual carriage elevated road, with horizon supporting beams spaced and founded along the alignment.

1.2 Objectives

The primary objectives of the PSCA was to assess the contamination status of the shallow subsurface soil along the proposed alignment to:

- Evaluate whether the soils pose a potential health risk to construction workers.
- Provide an indication of the soil hazard category of the soils with reference to the Industrial Waste Resource Guidelines (IWRG).
- Provide an indication of whether the soil are impacted by per- and poly-fluoroalkyl substances (PFAS), which would require on-site management during construction.

2.0 Scope of Works and Methodology

The following sections describe the scope of works and assessment methodology used for the PSCA.

2.1 Relevant Guidelines and Standards

The PSCA was undertaken in accordance with the following guidelines and standards:

- *Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil, Part 1: Non-Volatile and Semi-Volatile Compounds*, Australian Standard: AS4482.1-2005 (Standards Australia, 2005).
- *Guide to the Sampling and Investigation of Potentially Contaminated Soil. Part 2: Volatile Substances, Australian Standard: AS4882.2-1999* (Standards Australia, 1999).
- Industrial Waste Resource Guidelines (IWRG) – *Soil Sampling Publication IWRG702*, EPA Victoria, June 2009.
- Industrial Waste Resource Guidelines (IWRG) - *Soil Hazard Categorisation and Management IWRG621*, EPA Victoria, June 2009.
- *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1)* (NEPC, 2013).
- *Interim Guideline on the Assessment and Management of Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS), Contaminated Sites Guidelines,* Government of Western Australia, Department of Environment Regulation (WA DER, 2016).
- *PFAS National Environmental Management Plan, January 2018*. (PFAS NEMP) The Heads of EPAs Australia and New Zealand (HEPA) (HEPA 2018).

2.2 Scope of Works

The fieldworks were undertaken on the 19 July 2018 and involved:

- Collection of soil samples from the fill and natural soils at 7 soil bore locations, using hand auger and push tube drilling techniques to maximum depths ranging 1.2 to 3.0 metres below ground level (m bgl).
- Collection of surface soil samples at an additional 3 locations using a hand trowel.
- Preservation and delivery of soil samples under chain of custody (COC) protocols to a subcontracted laboratory for analysis using National Association Testing Authorities (NATA) accredited methods.
- Laboratory analysis of selected soil samples by the laboratory, using methods accredited by the National Association of Testing Authorities (NATA). This comprised:
    - 4 primary samples for EPA Screen - IWRG 621 suite of analytes[1]
    - 10 primary samples for TRH, PAHs and IWRG metals (arsenic, cadmium, copper, chromium, lead, mercury, molybdenum, nickel, tin, selenium, silver and zinc)
    - 14 primary samples for PFAS

[1] IWRG621 Suite, includes metals (arsenic, cadmium, copper, chromium VI, lead, mercury, molybdenum, nickel, tin, selenium, silver and zinc), total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAHs), monocyclic aromatic hydrocarbons (MAH), organochlorine pesticides (OCPs), volatile chlorinated hydrocarbons (VCHs), polychlorinated biphenyls (PCBs), cyanide, phenols and total fluoride

    - 5 primary samples for leachable PFAS, following elutriation using Australian Standard leaching Procedure (ASLP) at pH – 5.
    - 5 primary samples for leachable arsenic, nickel and / or zinc, following elutriation using Australian Standard leaching Procedure (ASLP) at pH – 5.
    - 3 field duplicates and 3 interlaboratory duplicates for quality control
- Comparison of the results against health-based investigation levels relevant for commercial / industrial land use. These included the:
    - NEPM 'Setting D' health investigation levels (HILs) / health screening levels (HSLs) for commercial / industrial land use (NEPC, 2013).
    - Direct contact soil human health screening values for PFAS contaminants and commercial / industrial use (HEPA, 2018).
- Comparison of the results against relevant soil waste management criteria, including:
    - Soil Hazard Threshold Limits outlined in the EPA Publication IWRG621 the IWRG - *Soil Hazard Categorisation and Management*, June 2009 (Publication IWRG621).
    - Interim landfill acceptance criteria for PFAS contaminants outlined in the *PFAS National Environmental Management Plan* (HEPA, 2018).

Senversa notes that the Industrial Waste Resource Guidelines currently do not have threshold criteria for PFAS impacted soil and such soils cannot be transported off-site without an EPA Victoria exemption or approvals. The NEMP interim landfill acceptance criteria are not endorsed by EPA Victoria and there are currently no landfill facilities licenced to receive the waste.

The *PFAS National Environmental Management Plan* (PFAS NEMP) (HEPA, 2018) was endorsed by the Department of Infrastructure Regional Development and Cities (the Department) in April 2018 as the framework for the management of PFAS materials on Federal Airport Land. This includes guidance on the on-site storage, containment and reuse of PFAS impacted material, which has been considered as part of this assessment.

2.3 Quality Assurance / Quality Control (QA/QC)

The data quality assurance and quality control (QA/QC) procedures adopted by Senversa provide a consistent approach to evaluation of whether the data quality objectives (DQOs) 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:

- Australia Standard (AS 4482.1) - Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil, Part 1: Non-volatile and Semi-volatile compounds (Standards Australia, 2005).
- National Environment Protection Council - *National Environment Protection Measure (Assessment of Site Contamination) Amendment Measure 2013 (No. 1), (*11 April 2013)
- United States Environmental Protection Agency (USEPA) - Guidance on Systematic Planning Using the Data Quality Objectives Process EPA QA/G-4, (2000).
- United States Environmental Protection Agency (USEPA) - Guidance on Environmental Data Verification and Data Validation EPA QA/G-8, (2002).

The data validation review has been provided within **Appendix A.** In summary, the results are considered to be representative of chemical concentrations in the soil sampled at the time of sampling, and are considered suitable to be used for their intended purpose in providing an understanding of the contamination status of soil at the site.

3.0 Results and Findings

3.1 Generalised Soil Profile

The generalised soil profile encountered during the soil investigation works is described in the table below and detailed in lithology logs in **Appendix B**. Photographs of lithology encountered are attached as **Appendix C**.

Approximate Depths (m bgl)	Lithology Type	Description
0 – 0.8	Fill	Grey to brown, fine to medium gravel, minor sand, clay and silt.
0.3 – 2.7	CLAY to Silty CLAY	Grey to red-brown, medium plasticity, firm
0.6 – 3.0	Sand CLAY to SAND	Lenses and thin layers of pale grey to white, fine grained calcareous sands, low plasticity clay, sands becoming orange-brown with weathered basalt gravels with increasing depth. Borehole refusal was encountered at four locations on suspected basalt bedrock at 1.9 to 3.0 m bgl.

3.2 Laboratory Results

Laboratory analytical results have been compared against health-based criteria within the attached **Table 1**, and IWRG classification criteria in **Table 2** and **Table 3**. Concentrations of PFAS have been screened against the NEMP interim landfill acceptance criteria in **Table 4** and **Table 5**. Results are summarised as follows:

- No concentrations of chemical analytes, including PFAS, exceeded health-based criteria for ongoing commercial/industrial use.
- Concentrations of arsenic (up to 83 mg/kg), nickel (up to 110 mg/kg), zinc (up to 390 mg/kg) and fluoride (up to 620 mg/kg) in isolated fill soil samples exceeded the IWRG “Fill Material” upper limits.

  Leachable concentrations of the above metals (arsenic, nickel and zinc) were below IWRG “Category C” upper limits.
- Total perfluorooctanesulfonic acid (PFOS) concentrations was detected within one primary sample (SS02 – 0.0052 mg/kg). No other concentrations of PFAS were measured above detection limits.
- Leachable PFOS concentrations were detected within the fill soils at two locations in unpaved areas of the site (SB01 and SS02). These concentrations were below the NEMP interim landfill acceptance criteria for disposal to unlined landfill (0.07µg/L).

Laboratory certificates of analysis are attached as **Appendix D**.

3.3 Health Risk to Construction Worker

Laboratory analytical results indicate no health risks associated with concentrations of chemicals measured in soils the site.

3.4 Soil Waste Management during Construction

Figure 2 illustrates the distribution of PFAS impacts and IWRG categorisation at the investigation locations. The results and findings of the preliminary soil contamination assessment works suggest that:

- The natural soils are not impacted by PFAS and are chemically consistent with an IWRG Fill Material categorisation.
- The fill soils beneath the paved areas of the proposed alignment (long-term car park and roads) are not impacted by PFAS and are chemically consistent with an IWRG Fill Material or Category C Contaminated Soil.
- The fill soils in unpaved areas along the proposed alignment are impacted by low-level PFAS concentrations and should not be transported off-site without EPA approvals.

Fill soils from unpaved areas of the site should remain on site and be reused (where possible) in accordance with Section 12 of the PFAS NEMP (HEPA, 2018). With reference to the PFAS NEMP in consideration of the nature of the proposed development, Senversa considers the following would be appropriate uses within Melbourne Airport (federal airport land), in consultation with APAM:

- Use as fill beneath sealed surfaces.
- Use as construction fill on road embankments, noting that risks should be assessed for stormwater runoff that may mobilise PFAS.
- Use as fill material in areas where similar background PFAS impacts exist.

The proposed reuse area must be:

- Located greater than 2.0 m above the seasonal maximum groundwater level.
- Located greater than 200 m of a surface water body or wetland.
- Located outside areas of protective native grasses.
- Located away from stormwater drains.

The natural soils and fill soils beneath the paved areas of the site (long-term car park and roads) can be reused on-site with no restrictions or could be disposed of to a landfill that is licenced to accept “Fill Material” or “Category C Contaminated Soils”, depending on the area the surplus soil is generated.

Senversa notes that the secondary laboratory reported detectable PFOS concentrations above its laboratory detection limits, but below the primary laboratories detection limits. Whilst this suggests that very low PFAS impacts are potentially present in natural soils and fill soils beneath the paved areas, the primary laboratory consistently reported concentrations below its standard detection limits in these areas.

Taking the above into consideration, Senversa considers the natural soils and fill soils beneath the paved areas of the site to be “Non-PFAS Impacted” and can be treated accordingly. Should the materials be transported off-site, confirmatory testing should be undertaken on stockpiled material and all results should be disclosed to the receiving licenced facility for approval before accepting the waste.

4.0 Conclusions and Recommendations

The following is concluded from the Preliminary Soil Contamination Assessment for the proposed T4 Express Elevated Road project at Melbourne Airport:

- The shallow sub-surface soils along the proposed alignment area not considered to pose an unacceptable health risk to construction works and end commercial users.
- The natural soils are not impacted by PFAS and are chemically consistent with an IWRG Fill Material categorisation.
- The fill soils beneath the paved areas of the proposed alignment (long-term car park and roads) are not impacted by PFAS and are chemically consistent with an IWRG Fill Material or Category C Contaminated Soil.
- The fill soils in unpaved areas along the proposed alignment are impacted by low-level PFAS concentrations and should not be transported off-site without EPA approval.

PFAS impacted soils identified in unpaved areas of the site should be reused on site (where possible) in accordance with Section 12 of the *PFAS National Environmental Management Plan*. To ensure compliance with the *Industrial Waste Resource Guidelines* and *PFAS National Environmental Management Plan,* it is recommended that a Soil Construction Management Plan (SCMP) be prepared to outline control measures and requirements for the handling, segregation, stockpiling, reuse and disposal of excavated soils during the project.

5.0 Principles and Limitations of Investigation

5.1 Inherent Uncertainties and Limitations

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

Area	Field Observations and Analytical Results
Elimination of Uncertainty	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.
Failure to Detect	Even when site investigation work is executed competently and in accordance with the appropriate Australian guidance, such as the National Environmental 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.
Limitations of Information	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.
Chemical Analysis Error	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.
Level of Assessment	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 of information obtained and the time required to obtain it outweigh the benefit of the information gained 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.
Comparison with Subsequent Inquiry	The justification and adequacy of the investigation findings 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.
Data Useability	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.
Nature of Advice	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.

5.2 Project Specific Uncertainties

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

- Soil investigations performed at the site were completed by drilling 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 limited fill soils were encountered at the site, the potential for solid inert wastes or hazardous materials to be present at the locations investigated that were not identified during the drilling is low. However, 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. 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).

6.0 References

Australia Standard (AS 4482.1) - *Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil, Part 1: Non-volatile and Semi-volatile compounds* (Standards Australia, 2005).

Australia Standard (AS 4482.2) - Guide to the Sampling and Investigation of Potentially Contaminated *Soil. Part 2: Volatile Substances, Australian Standard: AS4882.2-1999* (Standards Australia, 1999).

EPA Victoria, 2009. Industrial Waste Resource Guidelines (IWRG) - *Soil Hazard Categorisation and Management,* Publication IWRG621.

EPA Victoria, 2009. Industrial Waste Resource Guidelines (IWRG) – *Soil Sampling,* Publication IWRG702.

The Heads of EPAs Australia and New Zealand (HEPA) (HEPA 2018), *PFAS National Environmental Management Plan, January 2018*. (PFAS NEMP), 2018.

National Environment Protection Council (NEPC, 2013), *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1),* 11 April 2013.

United States Environmental Protection Agency (USEPA) - *Guidance on Systematic Planning Using the Data Quality Objectives Process* EPA QA/G-4, 2000.

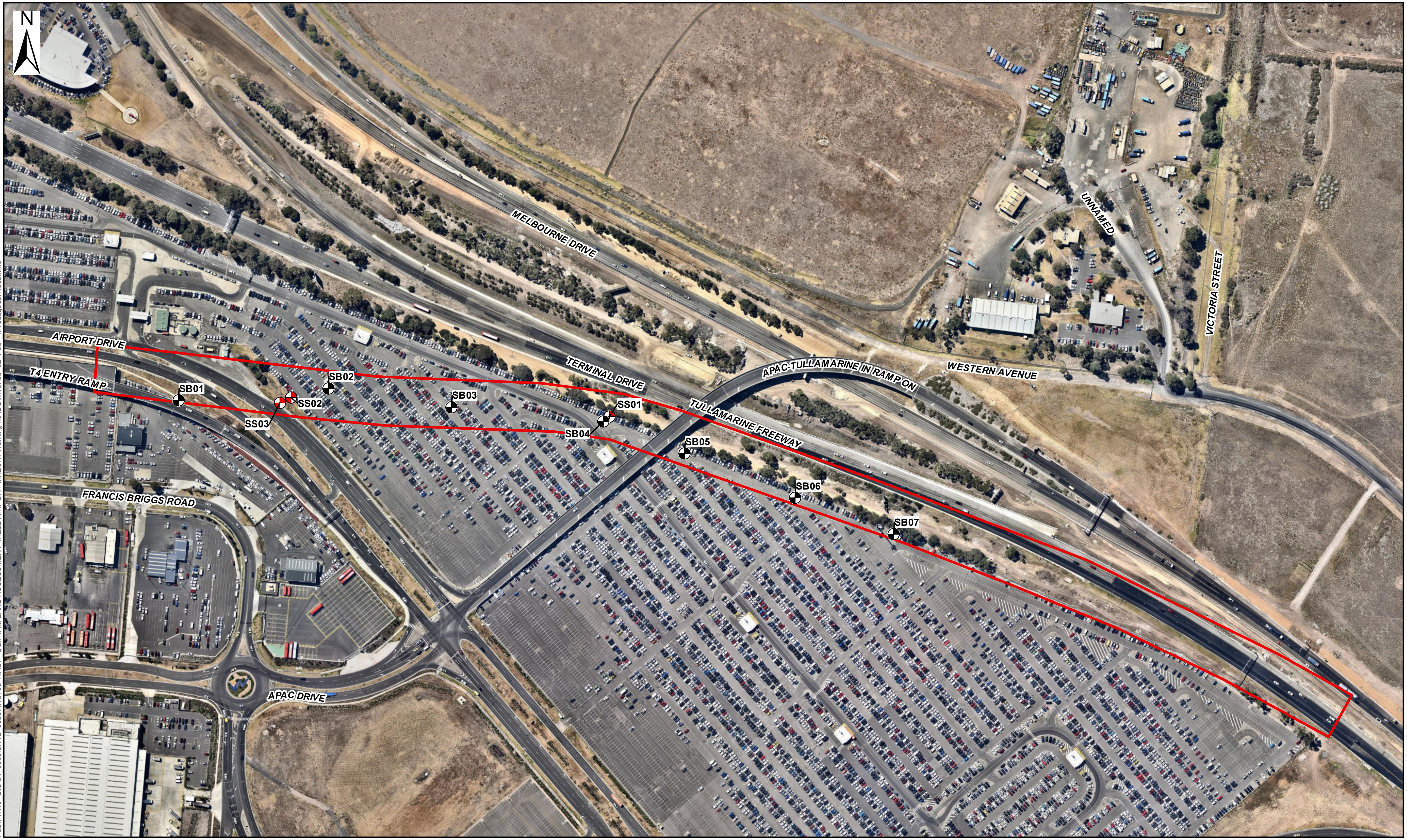
United States Environmental Protection Agency (USEPA) - *Guidance on Environmental Data Verification and Data Validation* EPA QA/G-8, 2002.

Western Australia Department of Environment Regulation (WA DER, 2016), *Interim Guideline on the Assessment and Management of Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS), Contaminated Sites Guideline,* 2016.

Figures

Figure 1: Investigation Locations

Figure 2: Nature and Extent of Impacts (Fill Soils)



Path: Y:\16_GIS\01_Jobs\3 VIC_Jobs\M16733_ARUP_CONTAM LAND ASSESSMENT_MELBAIRPORT\MXDs\1_Working MXDS\M16733_02_F001_investigation locs.mxd

This Drawing is Subject to COPYRIGHT. No portion of this drawing may be removed, extracted, copied, electronically stored or disseminated in any form without the prior written permission of Senversa.

senversa

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

Legend
- Soil Bore
- Surface Soil
- Study Area Boundary

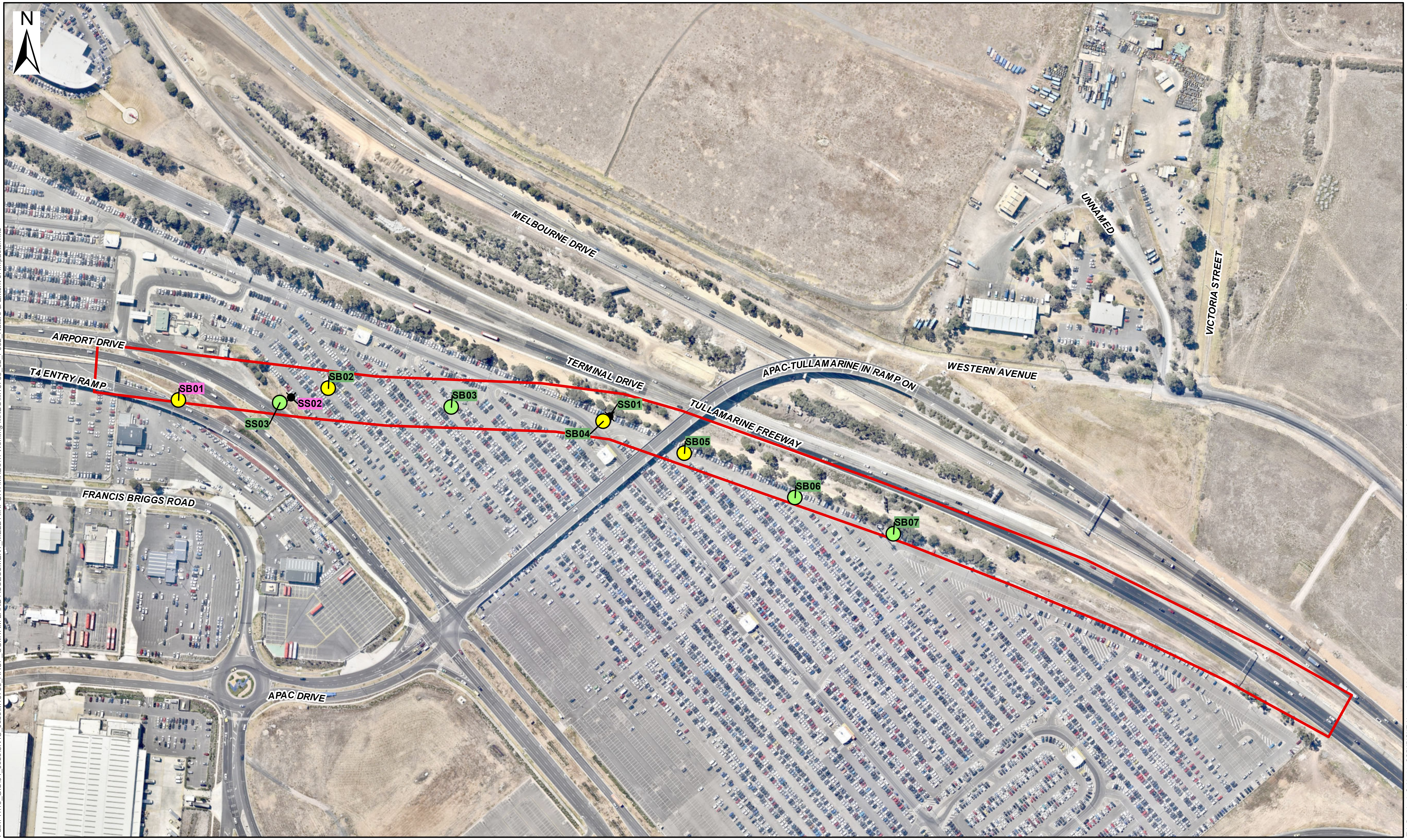
Notes:
Cadastre and road data sourced from land.vic.gov.au (DELWP)
Aerial imagery sourced from Nearmap Pty Ltd

Designed:	S. O'Connor	Date:	6/08/2018
Drawn:	S. Koroblitsas	Revision:	0
Checked:	.	Scale:	1:3,000 (A3)
File:	M16733_02_F001_investigation locs		

0 25 50 100 150 200 Metres

Datum GDA 1994, Projection MGA Zone 55

Figure No: 1
Title: Investigation Locations
Project: Preliminary Contamination Assessment
Location: Melbourne Airport
Client: ARUP



Path: Y:\16_GIS\01_Jobs\3.VIC_Jobs\M16733_ARUP_CONTAM LAND ASSESSMENT_MELB AIRPORT\MXDs\1. Working MXDs\M16733_02_F002_Nature & Extent of Impacts.mxd

senversa

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

Legend

- Below IWRG Category B Upper Limits
- Below IWRG Category C Upper Limits
- Below IWRG Fill Material Upper Limits
- Not Analysed for IWRG Analytes
- Study Area Boundary

PFAS Impacted
Non PFAS Impacted
Not analysed for PFAS

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

Designed:	S. O'Connor	Date:	7/08/2018
Drawn:	S. Koroblitsas	Revision:	0
Checked:	.	Scale:	1:3,000 (A3)
File:	M16733_02_F002_Nature & Extent of Impacts		

0 25 50 100 150 200 Metres
Datum GDA 1994, Projection MGA Zone 55

Figure No:	**2**
Title:	**Nature & Extent of Impacts (Fill Material)**
Project:	Preliminary Contamination Assessment
Location:	Melbourne Airport
Client:	ARUP

Tables

Table 1: Soil Analytical Results vs. Health Investigation Levels

Table 2: Soil Analytical Results vs. IWRG Threshold Limits

Table 3: Soil Leachability Results vs. IWRG Threshold Limits

Table 4: PFAS Analytical Results vs. Screening Criteria for Disposal

Table 5: PFAS Leachability Results vs. Screening Criteria for Disposal

Table 1: Soil Results vs. Health Investigation Levels
Preliminary Soil Contamination Assessment
T4 Elevated Road, Melbourne Airport
M16733

senversa

	Unit	EQL	NEPC 2013 - Human Health Setting 'D' - Commercial / Industrial	NEMP 2018 Human health - Industrial / Commercial													
Location Code					SB01			SB02		SB03			SB04				
Field ID					SB01_0.0-0.1	SB01_0.4-0.5	SB01_1.1-1.2	SB02_0.1-0.2	SB02_0.3-0.4	SB03_0.1-0.2	SB03_0.2-0.3	SB03_1.6-1.7	SB04_0.1-0.2	SB04_1.0-1.1	SB05_0.1-0.2	QA5	QA6
Date					19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018
Depth					0 - 0.1	0.4 - 0.5	1.1 - 1.2	0.1 - 0.2	0.3 - 0.4	0.1 - 0.2	0.2 - 0.3	1.6 - 1.7	0.1 - 0.2	1 - 1.1	0.1 - 0.2	0.1 - 0.2	0.1 - 0.2
Sample Type					Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Field_D	Interlab_D
Lab Report No.					608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	EM1811718
Physical Parameters																	
Moisture Content	%	0.1			3.9	4.9	20	6.8	4.7	5.3	9.6	17	3.0	14	2.8	2.0	1.8
pH (aqueous extract)	pH Units	0.1			-	8.5	-	-	-	-	7.7	-	-	-	7.9	7.8	7.6
Inorganics																	
Cyanide (Total)	mg/kg	1	1500[#1]		-	<5	-	-	-	-	<5	-	-	-	<5	<5	<1
Fluoride	mg/kg	40	47000[#2]		-	180	-	-	-	-	100	-	-	-	190	150	620
Metals																	
Arsenic	mg/kg	2	3000[#1]		<2	83	<2	<2	-	18	<2	-	28	<2	16	19	20
Cadmium	mg/kg	0.4	900[#1]		<0.4	<0.4	<0.4	<0.4	-	<0.4	<0.4	-	<0.4	<0.4	<0.4	<0.4	<1
Chromium	mg/kg	5	3600[#3]		24	50	53	19	-	34	26	-	32	36	37	32	-
Copper	mg/kg	5	240000[#1]		35	24	5.9	33	-	15	<5	-	20	5.6	20	17	16
Lead	mg/kg	5	1500[#4]		250	11	12	<5	-	<5	8.4	-	5.1	5.6	<5	<5	<5
Mercury	mg/kg	0.1	730[#1]		<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	mg/kg	2	5800[#2]		<5	<5	<5	<5	-	<5	<5	-	<5	<5	<5	<5	<2
Chromium(VI)	mg/kg	0.5	3600[#1]		-	<1	-	-	-	-	<1	-	-	-	<1	<1	<0.5
Nickel	mg/kg	2	6000[#1]		87	50	41	110	-	16	7.5	-	18	34	19	17	16
Selenium	mg/kg	2	10000[#1]		<2	<2	<2	<2	-	<2	<2	-	<2	<2	<2	<2	<5
Silver	mg/kg	0.2	5800[#2]		<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<2
Tin	mg/kg	5	700000[#2]		<10	<10	<10	<10	-	<10	<10	-	<10	<10	<10	<10	<5
Zinc	mg/kg	5	400000[#1]		55	56	14	54	-	55	9.6	-	66	19	67	58	47
BTEX																	
Benzene	mg/kg	0.1	3[#5]		-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	<0.2
Toluene	mg/kg	0.1	99000[#5]		-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	<0.5
Ethylbenzene	mg/kg	0.1	27000[#5]		-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	<0.5
Xylene (m & p)	mg/kg	0.2			-	<0.2	-	-	-	-	<0.2	-	-	-	<0.2	<0.2	<0.5
Xylene (o)	mg/kg	0.1			-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	<0.5
Total Xylene	mg/kg	0.3	230[#5]		-	<0.3	-	-	-	-	<0.3	-	-	-	<0.3	<0.3	<0.5
Total Petroleum Hydrocarbons																	
C6-C9 Fraction	mg/kg	10	260[#6]		<20	<20	<20	<20	-	<20	<20	-	<20	<20	<20	<20	<10
C10-C14 Fraction	mg/kg	20	20000[#7]		<20	<20	<20	<20	-	<20	<20	-	<20	<20	<20	<20	<50
C15-C28 Fraction	mg/kg	50			<50	<50	<50	<50	-	<50	<50	-	<50	<50	<50	<50	<100
C29-C36 Fraction	mg/kg	50			<50	<50	<50	<50	-	<50	<50	-	<50	<50	<50	<50	<100
C10-C36 Fraction (Sum)	mg/kg	50			<50	<50	<50	<50	-	<50	<50	-	<50	<50	<50	<50	<50
Total Recoverable Hydrocarbons																	
C6-C10 Fraction	mg/kg	10	260[#8]		<20	<20	<20	<20	-	<20	<20	-	<20	<20	<20	<20	<10
C6-C10 Fraction minus BTEX (F1)	mg/kg	10	260[#9]		<20	<20	<20	<20	-	<20	<20	-	<20	<20	<20	<20	<10
>C10-C16 Fraction	mg/kg	50	20000[#10]		<50	<50	<50	<50	-	<50	<50	-	<50	<50	<50	<50	<50
>C10-C16 Fraction minus naphthalene (F2)	mg/kg	50	20000[#9]		<50	<50	<50	<50	-	<50	<50	-	<50	<50	<50	<50	<50
>C16-C34 Fraction	mg/kg	100	27000[#9]		<100	<100	<100	<100	-	<100	<100	-	<100	<100	<100	<100	<100
>C34-C40 Fraction	mg/kg	100	38000[#9]		<100	<100	<100	<100	-	<100	<100	-	<100	<100	<100	<100	<100
>C10-C40 Fraction (Sum)	mg/kg	50			-	-	-	-	-	-	-	-	-	-	-	-	<50
MAH																	
1,2,4-Trimethylbenzene	mg/kg	0.5	240[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
1,3,5-Trimethylbenzene	mg/kg	0.5	12000[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Isopropylbenzene	mg/kg	0.5	9900[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Styrene	mg/kg	0.5	35000[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5
Total MAH	mg/kg	0.5			-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Total Monocylic Aromatic Hydrocarbons	mg/kg	0.2			-	-	-	-	-	-	-	-	-	-	-	-	<0.2
Halogenated Benzenes																	
1,2-Dichlorobenzene	mg/kg	0.02	9300[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02
1,2,4-Trichlorobenzene	mg/kg	0.01	110[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.01
1,3-Dichlorobenzene	mg/kg	0.5			-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
1,4-Dichlorobenzene	mg/kg	0.02	11[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02
4-Chlorotoluene	mg/kg	0.5	23000[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Bromobenzene	mg/kg	0.5	1800[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Chlorobenzene	mg/kg	0.02	1300[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02
Halogenated Hydrocarbons																	
1,2-Dibromoethane	mg/kg	0.5	0.16[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Bromomethane	mg/kg	0.5	30[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Dichlorodifluoromethane	mg/kg	0.5	370[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Iodomethane	mg/kg	0.5			-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Trichlorofluoromethane	mg/kg	0.5	350000[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Chlorinated Hydrocarbons																	
1,1-Dichloroethane	mg/kg	0.5	16[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
1,1-Dichloroethene	mg/kg	0.01	1000[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.01

Table 1: Soil Results vs. Health Investigation Levels
Preliminary Soil Contamination Assessment
T4 Elevated Road, Melbourne Airport
M16733

senversa

	Unit	EQL	NEPC 2013 - Human Health Setting 'D' - Commercial / Industrial	NEMP 2018 Human health - Industrial / Commercial															
				Location Code	SB05				SB06			SB07						SS01	SS02
				Field ID	SB05_0.3-0.4	QA3	QA4	SB05_0.5-0.6	SB06_0.1-0.2	SB06_0.3-0.4	SB06_0.7-0.8	SB07_0.0-0.1	QA1	QA2	SB07_0.1-0.2	SB07_0.5-0.6	SB07_1.1-1.2	SS01	SS02
				Date	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018
				Depth	0.3 - 0.4	0.3 - 0.4	0.3 - 0.4	0.5 - 0.6	0.1 - 0.2	0.3 - 0.4	0.7 - 0.8	0 - 0.1	0 - 0.1	0 - 0.1	0.1 - 0.2	0.5 - 0.6	1.1 - 1.2		
				Sample Type	Normal	Field_D	Interlab_D	Normal	Normal	Normal	Normal	Normal	Field_D	Interlab_D	Normal	Normal	Normal	Normal	Normal
				Lab Report No.	608706	608706	EM1811718	608706	608706	608706	608706	608706	608706	EM1811718	608706	608706	608706	608706	608706
Physical Parameters																			
Moisture Content	%	0.1			12	9.9	11.4	17	1.3	15	15	11	5.9	8.4	7.5	10.0	18	4.6	20
pH (aqueous extract)	pH Units	0.1			-	-	-	-	-	-	-	-	-	-	8.0	-	-	-	-
Inorganics																			
Cyanide (Total)	mg/kg	1	1500[#1]		-	-	-	-	-	-	-	-	-	-	<5	-	-	-	-
Fluoride	mg/kg	40	47000[#2]		-	-	-	-	-	-	-	-	-	-	120	-	-	-	-
Metals																			
Arsenic	mg/kg	2	3000[#1]		-	-	-	2.1	9.5	-	-	-	-	-	2.8	<2	-	-	3.7
Cadmium	mg/kg	0.4	900[#1]		-	-	-	<0.4	<0.4	-	-	-	-	-	<0.4	<0.4	-	-	<0.4
Chromium	mg/kg	5	3600[#3]		-	-	-	59	26	-	-	-	-	-	30	14	-	-	42
Copper	mg/kg	5	240000[#1]		-	-	-	15	16	-	-	-	-	-	10	<5	-	-	31
Lead	mg/kg	5	1500[#4]		-	-	-	12	<5	-	-	-	-	-	17	6.7	-	-	35
Mercury	mg/kg	0.1	730[#1]		-	-	-	<0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	<0.1
Molybdenum	mg/kg	2	5800[#2]		-	-	-	<5	<5	-	-	-	-	-	<5	<5	-	-	<5
Chromium(VI)	mg/kg	0.5	3600[#1]		-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
Nickel	mg/kg	2	6000[#1]		-	-	-	50	13	-	-	-	-	-	16	6.3	-	-	48
Selenium	mg/kg	2	10000[#1]		-	-	-	<2	<2	-	-	-	-	-	<2	<2	-	-	<2
Silver	mg/kg	0.2	5800[#2]		-	-	-	<0.2	<0.2	-	-	-	-	-	<0.2	<0.2	-	-	<0.2
Tin	mg/kg	5	700000[#2]		-	-	-	<10	<10	-	-	-	-	-	<10	<10	-	-	<10
Zinc	mg/kg	5	400000[#1]		-	-	-	21	59	-	-	-	-	-	25	7.7	-	-	390
BTEX																			
Benzene	mg/kg	0.1	3[#5]		-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
Toluene	mg/kg	0.1	99000[#5]		-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
Ethylbenzene	mg/kg	0.1	27000[#5]		-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
Xylene (m & p)	mg/kg	0.2			-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
Xylene (o)	mg/kg	0.1			-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
Total Xylene	mg/kg	0.3	230[#5]		-	-	-	-	-	-	-	-	-	-	<0.3	-	-	-	-
Total Petroleum Hydrocarbons																			
C6-C9 Fraction	mg/kg	10	260[#6]		-	-	-	<20	<20	-	-	-	-	-	<20	<20	-	-	<20
C10-C14 Fraction	mg/kg	20	20000[#7]		-	-	-	<20	<20	-	-	-	-	-	<20	<20	-	-	23
C15-C28 Fraction	mg/kg	50			-	-	-	<50	<50	-	-	-	-	-	<50	<50	-	-	160
C29-C36 Fraction	mg/kg	50			-	-	-	<50	110	-	-	-	-	-	<50	<50	-	-	220
C10-C36 Fraction (Sum)	mg/kg	50			-	-	-	<50	110	-	-	-	-	-	<50	<50	-	-	403
Total Recoverable Hydrocarbons																			
C6-C10 Fraction	mg/kg	10	260[#8]		-	-	-	<20	<20	-	-	-	-	-	<20	<20	-	-	<20
C6-C10 Fraction minus BTEX (F1)	mg/kg	10	260[#9]		-	-	-	<20	<20	-	-	-	-	-	<20	<20	-	-	<20
>C10-C16 Fraction	mg/kg	50	20000[#10]		-	-	-	<50	<50	-	-	-	-	-	<50	<50	-	-	<50
>C10-C16 Fraction minus naphthalene (F2)	mg/kg	50	20000[#9]		-	-	-	<50	<50	-	-	-	-	-	<50	<50	-	-	<50
>C16-C34 Fraction	mg/kg	100	27000[#9]		-	-	-	<100	<100	-	-	-	-	-	<100	<100	-	-	290
>C34-C40 Fraction	mg/kg	100	38000[#9]		-	-	-	<100	100	-	-	-	-	-	<100	<100	-	-	120
>C10-C40 Fraction (Sum)	mg/kg	50			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAH																			
1,2,4-Trimethylbenzene	mg/kg	0.5	240[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
1,3,5-Trimethylbenzene	mg/kg	0.5	12000[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Isopropylbenzene	mg/kg	0.5	9900[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Styrene	mg/kg	0.5	35000[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Total MAH	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Total Monocylic Aromatic Hydrocarbons	mg/kg	0.2			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Halogenated Benzenes																			
1,2-Dichlorobenzene	mg/kg	0.02	9300[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.01	110[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.02	11[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
4-Chlorotoluene	mg/kg	0.5	23000[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Bromobenzene	mg/kg	0.5	1800[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Chlorobenzene	mg/kg	0.02	1300[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Halogenated Hydrocarbons																			
1,2-Dibromoethane	mg/kg	0.5	0.16[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Bromomethane	mg/kg	0.5	30[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Dichlorodifluoromethane	mg/kg	0.5	370[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Iodomethane	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Trichlorofluoromethane	mg/kg	0.5	350000[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Chlorinated Hydrocarbons																			
1,1-Dichloroethane	mg/kg	0.5	16[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
1,1-Dichloroethene	mg/kg	0.01	1000[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-

Table 1: Soil Results vs. Health Investigation Levels
Preliminary Soil Contamination Assessment
T4 Elevated Road, Melbourne Airport
M16733

				Location Code	SB01			SB02		SB03			SB04				
				Field ID	SB01_0.0-0.1	SB01_0.4-0.5	SB01_1.1-1.2	SB02_0.1-0.2	SB02_0.3-0.4	SB03_0.1-0.2	SB03_0.2-0.3	SB03_1.6-1.7	SB04_0.1-0.2	SB04_1.0-1.1	SB05_0.1-0.2	QA5	QA6
				Date	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018
				Depth	0 - 0.1	0.4 - 0.5	1.1 - 1.2	0.1 - 0.2	0.3 - 0.4	0.1 - 0.2	0.2 - 0.3	1.6 - 1.7	0.1 - 0.2	1 - 1.1	0.1 - 0.2	0.1 - 0.2	0.1 - 0.2
				Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Field_D	Interlab_D
				Lab Report No.	608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	EM1811718
	Unit	EQL	NEPC 2013 - Human Health Setting 'D' - Commercial / Industrial	NEMP 2018 Human health - Industrial / Commercial													
1,1,1,2-Tetrachloroethane	mg/kg	0.01	8.8#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.01
1,1,1-Trichloroethane	mg/kg	0.01	36000#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.01
1,1,2-Trichloroethane	mg/kg	0.04	5#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.04
1,1,2,2-Tetrachloroethane	mg/kg	0.02	2.7#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02
1,2,3-Trichloropropane	mg/kg	0.5	0.11#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
1,2-Dichloroethane	mg/kg	0.02	2#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02
1,3-Dichloropropane	mg/kg	0.5	23000#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
1,2-Dichloropropane	mg/kg	0.5	4.4#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Bromochloromethane	mg/kg	0.5	630#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Bromodichloromethane	mg/kg	0.5	1.3#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Bromoform	mg/kg	0.5	86#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Carbon Tetrachloride	mg/kg	0.01	2.9#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.01
Chlorodibromomethane	mg/kg	0.5	39#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Chloroethane	mg/kg	0.5	57000#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Chloroform	mg/kg	0.02	1.4#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02
Chloromethane	mg/kg	0.5	460#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
cis-1,2-Dichloroethene	mg/kg	0.01	2300#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.01
Dibromomethane	mg/kg	0.5	99#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
cis-1,3-Dichloropropene	mg/kg	0.5			-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Dichloromethane	mg/kg	0.4	1000#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.4
Hexachlorobutadiene	mg/kg	0.02	5.3#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02
Tetrachloroethene	mg/kg	0.02	100#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02
trans-1,2-Dichloroethene	mg/kg	0.02	23000#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02
trans-1,3-Dichloropropene	mg/kg	0.5			-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Trichloroethene	mg/kg	0.02	6#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02
Vinyl Chloride	mg/kg	0.02	1.7#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02
Total Chlorinated Hydrocarbons	mg/kg	0.01			-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.01
Total Other Chlorinated Hydrocarbons	mg/kg	0.01			-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.01
PAHs																	
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
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
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
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	<0.5	<0.5
Benzo(a)pyrene	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
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	<0.5	-
Benzo(b+j+k)fluoranthene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-
Chrysene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<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	<0.5	<0.5
Naphthalene	mg/kg	0.5	11000#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	<0.5	<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	<0.5	<0.5
Benzo(a)pyrene TEQ (Zero)	mg/kg	0.5	40#1		<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Sum of Polycyclic aromatic hydrocarbons (PAH)	mg/kg	0.5	4000#1		<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Phenols																	
2-Methylphenol	mg/kg	0.2	41000#2		-	<0.2	-	-	-	-	<0.2	-	-	-	<0.2	<0.2	<1
2-Nitrophenol	mg/kg	1			-	<1	-	-	-	-	<1	-	-	-	<1	<1	<1
2,4-Dimethylphenol	mg/kg	0.5	16000#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<1
2,4-Dinitrophenol	mg/kg	5	1600#2		-	<5	-	-	-	-	<5	-	-	-	<5	<5	<5
3-&4-Methylphenol (m&p-cresol)	mg/kg	0.4			-	<0.4	-	-	-	-	<0.4	-	-	-	<0.4	<0.4	<1
4-Chloro-3-methylphenol	mg/kg	0.03	82000#2		-	<1	-	-	-	-	<1	-	-	-	<1	<1	<0.03
4-Nitrophenol	mg/kg	5			-	<5	-	-	-	-	<5	-	-	-	<5	<5	<5
4,6-Dinitro-2-methylphenol	mg/kg	5	66#2		-	<5	-	-	-	-	<5	-	-	-	<5	<5	<5
4,6-Dinitro-o-cyclohexyl phenol	mg/kg	5	1600#2		-	<20	-	-	-	-	<20	-	-	-	<20	<20	<5
Phenol	mg/kg	0.5	240000#1		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<1
Phenols (non-halogenated)	mg/kg	1			-	<20	-	-	-	-	<20	-	-	-	<20	<20	<1
Halogenated Phenols																	
2,4,5-Trichlorophenol	mg/kg	0.05	82000#2		-	<1	-	-	-	-	<1	-	-	-	<1	<1	<0.05
2,4,6-Trichlorophenol	mg/kg	0.05	210#2		-	<1	-	-	-	-	<1	-	-	-	<1	<1	<0.05
2,4-Dichlorophenol	mg/kg	0.03	2500#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.03
2,6-Dichlorophenol	mg/kg	0.03			-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.03
2-Chlorophenol	mg/kg	0.03	5800#2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.03
Pentachlorophenol	mg/kg	0.2	660#1		-	<1	-	-	-	-	<1	-	-	-	<1	<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	-	-	-	-	<1	-	-	-	<1	<1	-
Phenols (Halogenated)	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	-	-	<0.03
Phenols (Total Halogenated)	mg/kg	1			-	<1	-	-	-	-	<1	-	-	-	<1	<1	-
Organochlorine Pesticides																	

Table 1: Soil Results vs. Health Investigation Levels
Preliminary Soil Contamination Assessment
T4 Elevated Road, Melbourne Airport
M16733

senversa

				Location Code	SB05				SB06			SB07						SS01	SS02
				Field ID	SB05_0.3-0.4	QA3	QA4	SB05_0.5-0.6	SB06_0.1-0.2	SB06_0.3-0.4	SB06_0.7-0.8	SB07_0.0-0.1	QA1	QA2	SB07_0.1-0.2	SB07_0.5-0.6	SB07_1.1-1.2	SS01	SS02
				Date	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018
				Depth	0.3 - 0.4	0.3 - 0.4	0.3 - 0.4	0.5 - 0.6	0.1 - 0.2	0.3 - 0.4	0.7 - 0.8	0 - 0.1	0 - 0.1	0 - 0.1	0.1 - 0.2	0.5 - 0.6	1.1 - 1.2		
				Sample Type	Normal	Field_D	Interlab_D	Normal	Normal	Normal	Normal	Normal	Field_D	Interlab_D	Normal	Normal	Normal	Normal	Normal
				Lab Report No.	608706	608706	EM1811718	608706	608706	608706	608706	608706	608706	EM1811718	608706	608706	608706	608706	608706
	Unit	EQL	NEPC 2013 - Human Health Setting 'D' - Commercial / Industrial	NEMP 2018 Human health - Industrial / Commercial															
1,1,1,2-Tetrachloroethane	mg/kg	0.01	8.8#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
1,1,1-Trichloroethane	mg/kg	0.01	36000#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
1,1,2-Trichloroethane	mg/kg	0.04	5#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/kg	0.02	2.7#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
1,2,3-Trichloropropane	mg/kg	0.5	0.11#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
1,2-Dichloroethane	mg/kg	0.02	2#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
1,3-Dichloropropane	mg/kg	0.5	23000#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
1,2-Dichloropropane	mg/kg	0.5	4.4#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Bromochloromethane	mg/kg	0.5	630#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Bromodichloromethane	mg/kg	0.5	1.3#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Bromoform	mg/kg	0.5	86#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Carbon Tetrachloride	mg/kg	0.01	2.9#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Chlorodibromomethane	mg/kg	0.5	39#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Chloroethane	mg/kg	0.5	57000#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Chloroform	mg/kg	0.02	1.4#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Chloromethane	mg/kg	0.5	460#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
cis-1,2-Dichloroethene	mg/kg	0.01	2300#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Dibromomethane	mg/kg	0.5	99#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
cis-1,3-Dichloropropene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Dichloromethane	mg/kg	0.4	1000#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Hexachlorobutadiene	mg/kg	0.02	5.3#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Tetrachloroethene	mg/kg	0.02	100#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
trans-1,2-Dichloroethene	mg/kg	0.02	23000#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
trans-1,3-Dichloropropene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Trichloroethene	mg/kg	0.02	6#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Vinyl Chloride	mg/kg	0.02	1.7#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Total Chlorinated Hydrocarbons	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Total Other Chlorinated Hydrocarbons	mg/kg	0.01			-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
PAHs																			
Acenaphthene	mg/kg	0.5			-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Acenaphthylene	mg/kg	0.5			-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Anthracene	mg/kg	0.5			-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Benz(a)anthracene	mg/kg	0.5			-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Benzo(a)pyrene	mg/kg	0.5			-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Benzo(b+j)fluoranthene	mg/kg	0.5			-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Benzo(b+j+k)fluoranthene	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	0.5			-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Benzo(k)fluoranthene	mg/kg	0.5			-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Chrysene	mg/kg	0.5			-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5			-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Fluoranthene	mg/kg	0.5			-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Fluorene	mg/kg	0.5			-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5			-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Naphthalene	mg/kg	0.5	11000#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
Pyrene	mg/kg	0.5			-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Benzo(a)pyrene TEQ (Zero)	mg/kg	0.5	40#1		-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Sum of Polycyclic aromatic hydrocarbons (PAH)	mg/kg	0.5	4000#1		-	-	-	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Phenols																			
2-Methylphenol	mg/kg	0.2	41000#2		-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
2-Nitrophenol	mg/kg	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.5	16000#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
2,4-Dinitrophenol	mg/kg	5	1600#2		-	-	-	-	-	-	-	-	-	-	<5	-	-	-	-
3-&4-Methylphenol (m&p-cresol)	mg/kg	0.4			-	-	-	-	-	-	-	-	-	-	<0.4	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.03	82000#2		-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
4-Nitrophenol	mg/kg	5			-	-	-	-	-	-	-	-	-	-	<5	-	-	-	-
4,6-Dinitro-2-methylphenol	mg/kg	5	66#2		-	-	-	-	-	-	-	-	-	-	<5	-	-	-	-
4,6-Dinitro-o-cyclohexyl phenol	mg/kg	5	1600#2		-	-	-	-	-	-	-	-	-	-	<20	-	-	-	-
Phenol	mg/kg	0.5	240000#1		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Phenols (non-halogenated)	mg/kg	1			-	-	-	-	-	-	-	-	-	-	<20	-	-	-	-
Halogenated Phenols																			
2,4,5-Trichlorophenol	mg/kg	0.05	82000#2		-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.05	210#2		-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.03	2500#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
2,6-Dichlorophenol	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
2-Chlorophenol	mg/kg	0.03	5800#2		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Pentachlorophenol	mg/kg	0.2	660#1		-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
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			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
Phenols (Halogenated)	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenols (Total Halogenated)	mg/kg	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
Organochlorine Pesticides																			

Table 1: Soil Results vs. Health Investigation Levels
Preliminary Soil Contamination Assessment
T4 Elevated Road, Melbourne Airport
M16733

senversa

				Location Code	SB01			SB02		SB03			SB04				
				Field ID	SB01_0.0-0.1	SB01_0.4-0.5	SB01_1.1-1.2	SB02_0.1-0.2	SB02_0.3-0.4	SB03_0.1-0.2	SB03_0.2-0.3	SB03_1.6-1.7	SB04_0.1-0.2	SB04_1.0-1.1	SB05_0.1-0.2	QA5	QA6
				Date	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018
				Depth	0 - 0.1	0.4 - 0.5	1.1 - 1.2	0.1 - 0.2	0.3 - 0.4	0.1 - 0.2	0.2 - 0.3	1.6 - 1.7	0.1 - 0.2	1 - 1.1	0.1 - 0.2	0.1 - 0.2	0.1 - 0.2
				Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Field_D	Interlab_D
				Lab Report No.	608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	EM1811718
	Unit	EQL	NEPC 2013 - Human Health Setting 'D' - Commercial / Industrial	NEMP 2018 Human health - Industrial / Commercial													
a-BHC	mg/kg	0.03	0.36[#2]		-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03
b-BHC	mg/kg	0.03	1.3[#2]		-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03
d-BHC	mg/kg	0.03			-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03
g-BHC (Lindane)	mg/kg	0.03	2.5[#2]		-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03
Aldrin	mg/kg	0.03			-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03
Dieldrin	mg/kg	0.03			-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03
Aldrin + Dieldrin	mg/kg	0.03	45[#1]		-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03
Chlordane	mg/kg	0.03			-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	<0.03
DDT	mg/kg	0.05			-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05
4,4-DDE	mg/kg	0.05			-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05
DDD	mg/kg	0.05			-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05
DDT+DDE+DDD	mg/kg	0.05	3600[#1]		-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05
Endosulfan I	mg/kg	0.03			-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03
Endosulfan II	mg/kg	0.03			-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03
Endosulfan sulfate	mg/kg	0.03			-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03
Endrin	mg/kg	0.03	100[#1]		-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03
Chlordane (cis)	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	-	-	<0.03
Chlordane (trans)	mg/kg	0.03	530[#1]		-	-	-	-	-	-	-	-	-	-	-	-	<0.03
Endrin aldehyde	mg/kg	0.03			-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03
Endrin ketone	mg/kg	0.05			-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-
Heptachlor	mg/kg	0.03	50[#1]		-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03
Heptachlor epoxide	mg/kg	0.03	0.33[#2]		-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03
Methoxychlor	mg/kg	0.03	2500[#1]		-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03
Toxaphene	mg/kg	1	160[#1]		-	<1	-	-	-	-	<1	-	-	-	<1	<1	-
Organochlorine Pesticides (EPAVic)	mg/kg	0.03			-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	<0.03
Other Organochlorine Pesticides (EPAVic)	mg/kg	0.03			-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	<0.03
Herbicides																	
Dinoseb	mg/kg	5	820[#2]		-	<20	-	-	-	-	<20	-	-	-	<20	<20	<5
Fungicides																	
Hexachlorobenzene	mg/kg	0.03	80[#1]		-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03
Polychlorinated Biphenyls																	
Aroclor 1016	mg/kg	0.1			-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	-
Aroclor 1221	mg/kg	0.1			-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	-
Aroclor 1232	mg/kg	0.1			-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	-
Aroclor 1242	mg/kg	0.1			-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	-
Aroclor 1248	mg/kg	0.1			-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	-
Aroclor 1254	mg/kg	0.1			-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	-
Aroclor 1260	mg/kg	0.1			-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	-
PCBs (Sum of total)	mg/kg	0.1	7[#11]		-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	<0.1
Solvents																	
Methyl Ethyl Ketone (MEK)	mg/kg	0.5	190000[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
4-Methyl-2-pentanone	mg/kg	0.5	140000[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Acetone	mg/kg	0.5	670000[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Allyl chloride	mg/kg	0.5	3.2[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
Carbon disulfide	mg/kg	0.5	3500[#2]		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-
(n:2) Fluorotelomer Sulfonic Acids																	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.0005			<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	<0.01	-	-	-	-
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Perfluoroalkane Carboxylic Acids																	
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Perfluorononanoic acid (PFNA)	mg/kg	0.0002			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Perfluorobutanoic acid (PFBA)	mg/kg	0.001			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002		50[#12]	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Perfluoroalkane Sulfonic Acids																	
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Perfluorooctanesulfonic acid (PFOS)	mg/kg	0.0002			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.0002			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	23000[#2]		<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Sum of PFHxS and PFOS	mg/kg	0.0002		20[#12]	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Perfluoroalkyl Sulfonamides																	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-

Table 1: Soil Results vs. Health Investigation Levels
Preliminary Soil Contamination Assessment
T4 Elevated Road, Melbourne Airport
M16733

	Unit	EQL	NEPC 2013 - Human Health Setting 'D' - Commercial / Industrial	NEMP 2018 Human health - Industrial / Commercial	SB05				SB06			SB07						SS01	SS02
Location Code					SB05				SB06			SB07						SS01	SS02
Field ID					SB05_0.3-0.4	QA3	QA4	SB05_0.5-0.6	SB06_0.1-0.2	SB06_0.3-0.4	SB06_0.7-0.8	SB07_0.0-0.1	QA1	QA2	SB07_0.1-0.2	SB07_0.5-0.6	SB07_1.1-1.2	SS01	SS02
Date					19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018
Depth					0.3 - 0.4	0.3 - 0.4	0.3 - 0.4	0.5 - 0.6	0.1 - 0.2	0.3 - 0.4	0.7 - 0.8	0 - 0.1	0 - 0.1	0 - 0.1	0.1 - 0.2	0.5 - 0.6	1.1 - 1.2		
Sample Type					Normal	Field_D	Interlab_D	Normal	Normal	Normal	Normal	Normal	Field_D	Interlab_D	Normal	Normal	Normal	Normal	Normal
Lab Report No.					608706	608706	EM1811718	608706	608706	608706	608706	608706	608706	EM1811718	608706	608706	608706	608706	608706
a-BHC	mg/kg	0.03	0.36[#2]		-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
b-BHC	mg/kg	0.03	1.3[#2]		-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
d-BHC	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
g-BHC (Lindane)	mg/kg	0.03	2.5[#2]		-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
Aldrin	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
Dieldrin	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
Aldrin + Dieldrin	mg/kg	0.03	45[#1]		-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
Chlordane	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
DDT	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
4,4-DDE	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
DDD	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
DDT+DDE+DDD	mg/kg	0.05	3600[#1]		-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
Endosulfan I	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
Endosulfan II	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
Endosulfan sulfate	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
Endrin	mg/kg	0.03	100[#1]		-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
Chlordane (cis)	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlordane (trans)	mg/kg	0.03	530[#1]		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin aldehyde	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
Endrin ketone	mg/kg	0.05			-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
Heptachlor	mg/kg	0.03	50[#1]		-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
Heptachlor epoxide	mg/kg	0.03	0.33[#2]		-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
Methoxychlor	mg/kg	0.03	2500[#1]		-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
Toxaphene	mg/kg	1	160[#1]		-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
Organochlorine Pesticides (EPAVic)	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
Other Organochlorine Pesticides (EPAVic)	mg/kg	0.03			-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
Herbicides																			
Dinoseb	mg/kg	5	820[#2]		-	-	-	-	-	-	-	-	-	-	<20	-	-	-	-
Fungicides																			
Hexachlorobenzene	mg/kg	0.03	80[#1]		-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-
Polychlorinated Biphenyls																			
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[#11]		-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
Solvents																			
Methyl Ethyl Ketone (MEK)	mg/kg	0.5	190000[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
4-Methyl-2-pentanone	mg/kg	0.5	140000[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Acetone	mg/kg	0.5	670000[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Allyl chloride	mg/kg	0.5	3.2[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Carbon disulfide	mg/kg	0.5	3500[#2]		-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
(n:2) Fluorotelomer Sulfonic Acids																			
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005			<0.005	<0.005	<0.0005	-	-	<0.005	<0.005	<0.005	<0.005	<0.0005	-	-	<0.005	<0.005	<0.005
6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.0005			<0.01	<0.01	<0.0005	-	-	<0.01	<0.01	<0.01	<0.01	<0.0005	-	-	<0.01	<0.01	<0.01
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005			<0.005	<0.005	<0.0005	-	-	<0.005	<0.005	<0.005	<0.005	<0.0005	-	-	<0.005	<0.005	<0.005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005			<0.005	<0.005	<0.0005	-	-	<0.005	<0.005	<0.005	<0.005	<0.0005	-	-	<0.005	<0.005	<0.005
Perfluoroalkane Carboxylic Acids																			
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002			<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002			<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002			<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005
Perfluorononanoic acid (PFNA)	mg/kg	0.0002			<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005
Perfluorobutanoic acid (PFBA)	mg/kg	0.001			<0.005	<0.005	<0.001	-	-	<0.005	<0.005	<0.005	<0.005	<0.001	-	-	<0.005	<0.005	<0.005
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002			<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005			<0.005	<0.005	<0.0005	-	-	<0.005	<0.005	<0.005	<0.005	<0.0005	-	-	<0.005	<0.005	<0.005
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002			<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002			<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002			<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002		50[#12]	<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005
Perfluoroalkane Sulfonic Acids																			
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002			<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005
Perfluorooctanesulfonic acid (PFOS)	mg/kg	0.0002			<0.005	<0.005	0.0005	-	-	<0.005	<0.005	<0.005	<0.005	0.0003	-	-	<0.005	<0.005	0.0052
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002			<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002			<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.0002			<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	23000[#2]		<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005
Sum of PFHxS and PFOS	mg/kg	0.0002		20[#12]	<0.005	<0.005	0.0005	-	-	<0.005	<0.005	<0.005	<0.005	0.0003	-	-	<0.005	<0.005	0.0052
Perfluoroalkyl Sulfonamides																			
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005			<0.005	<0.005	<0.0005	-	-	<0.005	<0.005	<0.005	<0.005	<0.0005	-	-	<0.005	<0.005	<0.005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005			<0.005	<0.005	<0.0005	-	-	<0.005	<0.005	<0.005	<0.005	<0.0005	-	-	<0.005	<0.005	<0.005

Table 1: Soil Results vs. Health Investigation Levels
Preliminary Soil Contamination Assessment
T4 Elevated Road, Melbourne Airport
M16733

senversa

	Unit	EQL	NEPC 2013 - Human Health Setting 'D' - Commercial / Industrial	NEMP 2018 Human health - Industrial / Commercial	SB01_0.0-0.1	SB01_0.4-0.5	SB01_1.1-1.2	SB02_0.1-0.2	SB02_0.3-0.4	SB03_0.1-0.2	SB03_0.2-0.3	SB03_1.6-1.7	SB04_0.1-0.2	SB04_1.0-1.1	SB05_0.1-0.2	QA5	QA6
Location Code					SB01			SB02		SB03			SB04				
Date					19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018
Depth					0 - 0.1	0.4 - 0.5	1.1 - 1.2	0.1 - 0.2	0.3 - 0.4	0.1 - 0.2	0.2 - 0.3	1.6 - 1.7	0.1 - 0.2	1 - 1.1	0.1 - 0.2	0.1 - 0.2	0.1 - 0.2
Sample Type					Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Field_D	Interlab_D
Lab Report No.					608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	EM1811718
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
N-ethyl-perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	mg/kg	0.0002			<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	<0.01	-	-	-	-
N-methylperfluorooctane sulfonamidoacetic acid (NMeFOSAA)	mg/kg	0.0002			<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	<0.01	-	-	-	-
PFAS																	
Sum of US EPA PFAS (PFOS + PFOA)*	mg/kg	0.005			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	mg/kg	0.005			<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-
Sum of PFAS	mg/kg	0.0002			<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	<0.05	-	-	-	-
Sum of PFAS (WA DER List)	mg/kg	0.0002			<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	<0.01	-	-	-	-

Comments

#1 NEPC (2013) - HIL 'D'.
#2 USEPA RSLs (May 2016 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 Friebel & Nadebaum (2011) - HSL-D. Only to be used where source is petrol or diesel fuel. Value for C6-C10 adopted for this fraction.
#7 Friebel & Nadebaum (2011) - HSL-D. Only to be used where source is petrol or diesel fuel. Value for C10-C16 adopted for this fraction.
#8 Friebel & Nadebaum (2011) - HSL-D. Only to be used where source is petrol or diesel fuel. Value is for F1 (C6-C10 less BTEX) but has been applied to this fraction for initial screening.
#9 Friebel & Nadebaum (2011) - HSL-D. Only to be used where source is petrol or diesel fuel.
#10 Friebel & Nadebaum (2011) - HSL-D. Only to be used where source is petrol or diesel fuel. Value is for F2 (C>10-C16 less naphthalene) but has been applied to this fraction for initial screening.
#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 Based on 20% of FSANZ TDI, i.e. up to 80% of exposure is assumed to come from other pathways.

Table 1: Soil Results vs. Health Investigation Levels
Preliminary Soil Contamination Assessment
T4 Elevated Road, Melbourne Airport
M16733

senversa

	Unit	EQL	NEPC 2013 - Human Health Setting 'D' - Commercial / Industrial	NEMP 2018 Human health - Industrial / Commercial															
Location Code					SB05				SB06			SB07						SS01	SS02
Field ID					SB05_0.3-0.4	QA3	QA4	SB05_0.5-0.6	SB06_0.1-0.2	SB06_0.3-0.4	SB06_0.7-0.8	SB07_0.0-0.1	QA1	QA2	SB07_0.1-0.2	SB07_0.5-0.6	SB07_1.1-1.2	SS01	SS02
Date					19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018
Depth					0.3 - 0.4	0.3 - 0.4	0.3 - 0.4	0.5 - 0.6	0.1 - 0.2	0.3 - 0.4	0.7 - 0.8	0 - 0.1	0 - 0.1	0 - 0.1	0.1 - 0.2	0.5 - 0.6	1.1 - 1.2		
Sample Type					Normal	Field_D	Interlab_D	Normal	Normal	Normal	Normal	Normal	Field_D	Interlab_D	Normal	Normal	Normal	Normal	Normal
Lab Report No.					608706	608706	EM1811718	608706	608706	608706	608706	608706	608706	EM1811718	608706	608706	608706	608706	608706
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005			<0.005	<0.005	<0.0005	-	-	<0.005	<0.005	<0.005	<0.005	<0.0005	-	-	<0.005	<0.005	<0.005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005			<0.005	<0.005	<0.0005	-	-	<0.005	<0.005	<0.005	<0.005	<0.0005	-	-	<0.005	<0.005	<0.005
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002			<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005	<0.005	<0.0002	-	-	<0.005	<0.005	<0.005
N-ethyl-perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	mg/kg	0.0002			<0.01	<0.01	<0.0002	-	-	<0.01	<0.01	<0.01	<0.01	<0.0002	-	-	<0.01	<0.01	<0.01
N-methylperfluorooctane sulfonamidoacetic acid (NMeFOSAA)	mg/kg	0.0002			<0.01	<0.01	<0.0002	-	-	<0.01	<0.01	<0.01	<0.01	<0.0002	-	-	<0.01	<0.01	<0.01
PFAS																			
Sum of US EPA PFAS (PFOS + PFOA)*	mg/kg	0.005			<0.005	<0.005	-	-	-	<0.005	<0.005	<0.005	<0.005	-	-	-	<0.005	<0.005	0.0052
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	mg/kg	0.005			<0.005	<0.005	-	-	-	<0.005	<0.005	<0.005	<0.005	-	-	-	<0.005	<0.005	0.0052
Sum of PFAS	mg/kg	0.0002			<0.05	<0.05	0.0005	-	-	<0.05	<0.05	<0.05	<0.05	0.0003	-	-	<0.05	<0.05	<0.05
Sum of PFAS (WA DER List)	mg/kg	0.0002			<0.01	<0.01	0.0005	-	-	<0.01	<0.01	<0.01	<0.01	0.0003	-	-	<0.01	<0.01	<0.01

Comments

#1 NEPC (2013) - HIL 'D'.
#2 USEPA RSLs (May 2016 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 Friebel & Nadebaum (2011) - HSL-D. Only to be used where source is petrol or diesel fuel. Value for C6-C10 adopted for this fraction.
#7 Friebel & Nadebaum (2011) - HSL-D. Only to be used where source is petrol or diesel fuel. Value for C10-C16 adopted for this fraction.
#8 Friebel & Nadebaum (2011) - HSL-D. Only to be used where source is petrol or diesel fuel. Value is for F1 (C6-C10 less BTEX) but has been applied to this fraction for initial screening.
#9 Friebel & Nadebaum (2011) - HSL-D. Only to be used where source is petrol or diesel fuel.
#10 Friebel & Nadebaum (2011) - HSL-D. Only to be used where source is petrol or diesel fuel. Value is for F2 (C>10-C16 less naphthalene) but has been applied to this fraction for initial screening.
#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 Based on 20% of FSANZ TDI, i.e. up to 80% of exposure is assumed to come from other pathways.

Table 2: Soil Analytical Results vs. IWRG Threshold Limits
Preliminary Soil Contamination Assessment
T4 Elevated Road, Melbourne Airport
M16733

	Unit	EQL	Exceeds IWRG621 Category B Upper Limits (TC2)	Exceeds IWRG621 Category C Upper Limits (TC1)	Exceeds IWRG621 Fill Material Upper Limits (TC0)																
					Location Code	SB01			SB02		SB03			SB04		SB05					
					Field ID	SB01_0.0-0.1	SB01_0.4-0.5	SB01_1.1-1.2	SB02_0.1-0.2	SB02_0.3-0.4	SB03_0.1-0.2	SB03_0.2-0.3	SB03_1.6-1.7	SB04_0.1-0.2	SB04_1.0-1.1	SB05_0.1-0.2	QA5	QA6	SB05_0.3-0.4	QA3	QA4
					Date	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018
					Depth	0 - 0.1	0.4 - 0.5	1.1 - 1.2	0.1 - 0.2	0.3 - 0.4	0.1 - 0.2	0.2 - 0.3	1.6 - 1.7	0.1 - 0.2	1 - 1.1	0.1 - 0.2	0.1 - 0.2	0.1 - 0.2	0.3 - 0.4	0.3 - 0.4	0.3 - 0.4
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Field_D	Interlab_D	Normal	Field_D	Interlab_D
					Lab Report No.	608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	EM1811718	608706	608706	EM1811718
Physical Parameters																					
Moisture Content	%	0.1				3.9	4.9	20	6.8	4.7	5.3	9.6	17	3.0	14	2.8	2.0	1.8	12	9.9	11.4
pH (aqueous extract)	pH Units	0.1	2-12.5[#1]		4-9[#2]	-	8.5	-	-	-	-	7.7	-	-	-	7.9	7.8	7.6	-	-	-
Inorganics																					
Cyanide Total	mg/kg	1	10000	2500	50	-	<5	-	-	-	-	<5	-	-	-	<5	<5	<1	-	-	-
Fluoride	mg/kg	40	40000	10000	450	-	180	-	-	-	-	100	-	-	-	190	150	620	-	-	-
Metals																					
Arsenic	mg/kg	2	2000	500	20	<2	83	<2	<2	-	18	<2	-	28	<2	16	19	20	-	-	-
Cadmium	mg/kg	0.4	400	100	3	<0.4	<0.4	<0.4	<0.4	-	<0.4	<0.4	-	<0.4	<0.4	<0.4	<0.4	<1	-	-	-
Chromium	mg/kg	5				24	50	53	19	-	34	26	-	32	36	37	32	-	-	-	-
Copper	mg/kg	5	20000	5000	100	35	24	5.9	33	-	15	<5	-	20	5.6	20	17	16	-	-	-
Lead	mg/kg	5	6000	1500	300	250	11	12	<5	-	<5	8.4	-	5.1	5.6	<5	<5	<5	-	-	-
Mercury	mg/kg	0.1	300	75	1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-
Molybdenum	mg/kg	2	4000	1000	40	<5	<5	<5	<5	-	<5	<5	-	<5	<5	<5	<5	<2	-	-	-
Chromium(VI)	mg/kg	0.5	2000	500	1	-	<1	-	-	-	-	<1	-	-	-	<1	<1	<0.5	-	-	-
Nickel	mg/kg	2	12000	3000	60	87	50	41	110	-	16	7.5	-	18	34	19	17	16	-	-	-
Selenium	mg/kg	2	200	50	10	<2	<2	<2	<2	-	<2	<2	-	<2	<2	<2	<2	<5	-	-	-
Silver	mg/kg	0.2	720	180	10	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<2	-	-	-
Tin	mg/kg	5		500	50	<10	<10	<10	<10	-	<10	<10	-	<10	<10	<10	<10	<5	-	-	-
Zinc	mg/kg	5	140000	35000	200	55	56	14	54	-	55	9.6	-	66	19	67	58	47	-	-	-
BTEX																					
Benzene	mg/kg	0.1	16	4	1	-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	<0.2	-	-	-
Toluene	mg/kg	0.1				-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	<0.5	-	-	-
Ethylbenzene	mg/kg	0.1				-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	<0.5	-	-	-
Xylene (m & p)	mg/kg	0.2				-	<0.2	-	-	-	-	<0.2	-	-	-	<0.2	<0.2	<0.5	-	-	-
Xylene (o)	mg/kg	0.1				-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	<0.5	-	-	-
Total Xylene	mg/kg	0.3				-	<0.3	-	-	-	-	<0.3	-	-	-	<0.3	<0.3	<0.5	-	-	-
Total Petroleum Hydrocarbons																					
C6-C9 Fraction	mg/kg	10	2600	650	100	<20	<20	<20	<20	-	<20	<20	-	<20	<20	<20	<20	<10	-	-	-
C10-C14 Fraction	mg/kg	20				<20	<20	<20	<20	-	<20	<20	-	<20	<20	<20	<20	<50	-	-	-
C15-C28 Fraction	mg/kg	50				<50	<50	<50	<50	-	<50	<50	-	<50	<50	<50	<50	<100	-	-	-
C29-C36 Fraction	mg/kg	50				<50	<50	<50	<50	-	<50	<50	-	<50	<50	<50	<50	<100	-	-	-
C10-C36 Fraction (Sum)	mg/kg	50	40000	10000	1000	<50	<50	<50	<50	-	<50	<50	-	<50	<50	<50	<50	<50	-	-	-
Total Recoverable Hydrocarbons																					
C6-C10 Fraction	mg/kg	10				<20	<20	<20	<20	-	<20	<20	-	<20	<20	<20	<20	<10	-	-	-
C6-C10 Fraction minus BTEX (F1)	mg/kg	10				<20	<20	<20	<20	-	<20	<20	-	<20	<20	<20	<20	<10	-	-	-
>C10-C16 Fraction	mg/kg	50				<50	<50	<50	<50	-	<50	<50	-	<50	<50	<50	<50	<50	-	-	-
>C10-C16 Fraction minus naphthalene (F2)	mg/kg	50				<50	<50	<50	<50	-	<50	<50	-	<50	<50	<50	<50	<50	-	-	-
>C16-C34 Fraction	mg/kg	100				<100	<100	<100	<100	-	<100	<100	-	<100	<100	<100	<100	<100	-	-	-
>C34-C40 Fraction	mg/kg	100				<100	<100	<100	<100	-	<100	<100	-	<100	<100	<100	<100	<100	-	-	-
>C10-C40 Fraction (Sum)	mg/kg	50				-	-	-	-	-	-	-	-	-	-	-	-	<50	-	-	-
MAH																					
1,2,4-Trimethylbenzene	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
1,3,5-Trimethylbenzene	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
Isopropylbenzene	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
Styrene	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	-	-	-
Total MAH	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
Total Monocylic Aromatic Hydrocarbons	mg/kg	0.2	240	70	7	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-
Halogenated Benzenes																					
1,2-Dichlorobenzene	mg/kg	0.02				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.01				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.01	-	-	-
1,3-Dichlorobenzene	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.02				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02	-	-	-
4-Chlorotoluene	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
Bromobenzene	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
Chlorobenzene	mg/kg	0.02				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02	-	-	-
Halogenated Hydrocarbons																					
1,2-Dibromoethane	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
Bromomethane	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
Dichlorodifluoromethane	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
Iodomethane	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
Trichlorofluoromethane	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
Chlorinated Hydrocarbons																					
1,1-Dichloroethane	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
1,1-Dichloroethene	mg/kg	0.01				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.01	-	-	-
1,1,1,2-Tetrachloroethane	mg/kg	0.01				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.01	-	-	-
1,1,1-Trichloroethane	mg/kg	0.01				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.01	-	-	-
1,1,2-Trichloroethane	mg/kg	0.04				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.04	-	-	-
1,1,2,2-Tetrachloroethane	mg/kg	0.02				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02	-	-	-
1,2,3-Trichloropropane	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
1,2-Dichloroethane	mg/kg	0.02				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02	-	-	-
1,3-Dichloropropane	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
1,2-Dichloropropane	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
Bromochloromethane	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-

Table 2: Soil Analytical Results vs. IWRG Threshold Limits
Preliminary Soil Contamination Assessment
T4 Elevated Road, Melbourne Airport
M16733

senversa

	Unit	EQL	Exceeds IWRG621 Category B Upper Limits (TC2)	Exceeds IWRG621 Category C Upper Limits (TC1)	Exceeds IWRG621 Fill Material Upper Limits (TC0)												
Location Code							SB06			SB07						SS01	SS02
Field ID						SB05_0.5-0.6	SB06_0.1-0.2	SB06_0.3-0.4	SB06_0.7-0.8	SB07_0.0-0.1	QA1	QA2	SB07_0.1-0.2	SB07_0.5-0.6	SB07_1.1-1.2	SS01	SS02
Date						19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018
Depth						0.5 - 0.6	0.1 - 0.2	0.3 - 0.4	0.7 - 0.8	0 - 0.1	0 - 0.1	0 - 0.1	0.1 - 0.2	0.5 - 0.6	1.1 - 1.2		
Sample Type						Normal	Normal	Normal	Normal	Normal	Field_D	Interlab_D	Normal	Normal	Normal	Normal	Normal
Lab Report No.						608706	608706	608706	608706	608706	608706	EM1811718	608706	608706	608706	608706	608706
Physical Parameters																	
Moisture Content	%	0.1				17	1.3	15	15	11	5.9	8.4	7.5	10.0	18	4.6	20
pH (aqueous extract)	pH Units	0.1	2-12.5#1		4-9#2	-	-	-	-	-	-	-	8.0	-	-	-	-
Inorganics																	
Cyanide Total	mg/kg	1	10000	2500	50	-	-	-	-	-	-	-	<5	-	-	-	-
Fluoride	mg/kg	40	40000	10000	450	-	-	-	-	-	-	-	120	-	-	-	-
Metals																	
Arsenic	mg/kg	2	2000	500	20	2.1	9.5	-	-	-	-	-	2.8	<2	-	-	3.7
Cadmium	mg/kg	0.4	400	100	3	<0.4	<0.4	-	-	-	-	-	<0.4	<0.4	-	-	<0.4
Chromium	mg/kg	5				59	26	-	-	-	-	-	30	14	-	-	42
Copper	mg/kg	5	20000	5000	100	15	16	-	-	-	-	-	10	<5	-	-	31
Lead	mg/kg	5	6000	1500	300	12	<5	-	-	-	-	-	17	6.7	-	-	35
Mercury	mg/kg	0.1	300	75	1	<0.1	<0.1	-	-	-	-	-	<0.1	<0.1	-	-	<0.1
Molybdenum	mg/kg	2	4000	1000	40	<5	<5	-	-	-	-	-	<5	<5	-	-	<5
Chromium(VI)	mg/kg	0.5	2000	500	1	-	-	-	-	-	-	-	<1	-	-	-	-
Nickel	mg/kg	2	12000	3000	60	50	13	-	-	-	-	-	16	6.3	-	-	48
Selenium	mg/kg	2	200	50	10	<2	<2	-	-	-	-	-	<2	<2	-	-	<2
Silver	mg/kg	0.2	720	180	10	<0.2	<0.2	-	-	-	-	-	<0.2	<0.2	-	-	<0.2
Tin	mg/kg	5		500	50	<10	<10	-	-	-	-	-	<10	<10	-	-	<10
Zinc	mg/kg	5	140000	35000	200	21	59	-	-	-	-	-	25	7.7	-	-	390
BTEX																	
Benzene	mg/kg	0.1	16	4	1	-	-	-	-	-	-	-	<0.1	-	-	-	-
Toluene	mg/kg	0.1				-	-	-	-	-	-	-	<0.1	-	-	-	-
Ethylbenzene	mg/kg	0.1				-	-	-	-	-	-	-	<0.1	-	-	-	-
Xylene (m & p)	mg/kg	0.2				-	-	-	-	-	-	-	<0.2	-	-	-	-
Xylene (o)	mg/kg	0.1				-	-	-	-	-	-	-	<0.1	-	-	-	-
Total Xylene	mg/kg	0.3				-	-	-	-	-	-	-	<0.3	-	-	-	-
Total Petroleum Hydrocarbons																	
C6-C9 Fraction	mg/kg	10	2600	650	100	<20	<20	-	-	-	-	-	<20	<20	-	-	<20
C10-C14 Fraction	mg/kg	20				<20	<20	-	-	-	-	-	<20	<20	-	-	23
C15-C28 Fraction	mg/kg	50				<50	<50	-	-	-	-	-	<50	<50	-	-	160
C29-C36 Fraction	mg/kg	50				<50	110	-	-	-	-	-	<50	<50	-	-	220
C10-C36 Fraction (Sum)	mg/kg	50	40000	10000	1000	<50	110	-	-	-	-	-	<50	<50	-	-	403
Total Recoverable Hydrocarbons																	
C6-C10 Fraction	mg/kg	10				<20	<20	-	-	-	-	-	<20	<20	-	-	<20
C6-C10 Fraction minus BTEX (F1)	mg/kg	10				<20	<20	-	-	-	-	-	<20	<20	-	-	<20
>C10-C16 Fraction	mg/kg	50				<50	<50	-	-	-	-	-	<50	<50	-	-	<50
>C10-C16 Fraction minus naphthalene (F2)	mg/kg	50				<50	<50	-	-	-	-	-	<50	<50	-	-	<50
>C16-C34 Fraction	mg/kg	100				<100	<100	-	-	-	-	-	<100	<100	-	-	290
>C34-C40 Fraction	mg/kg	100				<100	100	-	-	-	-	-	<100	<100	-	-	120
>C10-C40 Fraction (Sum)	mg/kg	50				-	-	-	-	-	-	-	-	-	-	-	-
MAH																	
1,2,4-Trimethylbenzene	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
1,3,5-Trimethylbenzene	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Isopropylbenzene	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Styrene	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Total MAH	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Total Monocylic Aromatic Hydrocarbons	mg/kg	0.2	240	70	7	-	-	-	-	-	-	-	-	-	-	-	-
Halogenated Benzenes																	
1,2-Dichlorobenzene	mg/kg	0.02				-	-	-	-	-	-	-	<0.5	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.01				-	-	-	-	-	-	-	<0.5	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.02				-	-	-	-	-	-	-	<0.5	-	-	-	-
4-Chlorotoluene	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Bromobenzene	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Chlorobenzene	mg/kg	0.02				-	-	-	-	-	-	-	<0.5	-	-	-	-
Halogenated Hydrocarbons																	
1,2-Dibromoethane	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Bromomethane	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Dichlorodifluoromethane	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Iodomethane	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Trichlorofluoromethane	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Chlorinated Hydrocarbons																	
1,1-Dichloroethane	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
1,1-Dichloroethene	mg/kg	0.01				-	-	-	-	-	-	-	<0.5	-	-	-	-
1,1,1,2-Tetrachloroethane	mg/kg	0.01				-	-	-	-	-	-	-	<0.5	-	-	-	-
1,1,1-Trichloroethane	mg/kg	0.01				-	-	-	-	-	-	-	<0.5	-	-	-	-
1,1,2-Trichloroethane	mg/kg	0.04				-	-	-	-	-	-	-	<0.5	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/kg	0.02				-	-	-	-	-	-	-	<0.5	-	-	-	-
1,2,3-Trichloropropane	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
1,2-Dichloroethane	mg/kg	0.02				-	-	-	-	-	-	-	<0.5	-	-	-	-
1,3-Dichloropropane	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
1,2-Dichloropropane	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Bromochloromethane	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-

Table 2: Soil Analytical Results vs. IWRG Threshold Limits
Preliminary Soil Contamination Assessment
T4 Elevated Road, Melbourne Airport
M16733

senversa

					Location Code	SB01			SB02		SB03			SB04		SB05					
					Field ID	SB01_0.0-0.1	SB01_0.4-0.5	SB01_1.1-1.2	SB02_0.1-0.2	SB02_0.3-0.4	SB03_0.1-0.2	SB03_0.2-0.3	SB03_1.6-1.7	SB04_0.1-0.2	SB04_1.0-1.1	SB05_0.1-0.2	QA5	QA6	SB05_0.3-0.4	QA3	QA4
					Date	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018
					Depth	0 - 0.1	0.4 - 0.5	1.1 - 1.2	0.1 - 0.2	0.3 - 0.4	0.1 - 0.2	0.2 - 0.3	1.6 - 1.7	0.1 - 0.2	1 - 1.1	0.1 - 0.2	0.1 - 0.2	0.1 - 0.2	0.3 - 0.4	0.3 - 0.4	0.3 - 0.4
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Field_D	Interlab_D	Normal	Field_D	Interlab_D
					Lab Report No.	608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	EM1811718	608706	608706	EM1811718
	Unit	EQL	Exceeds IWRG621 Category B Upper Limits (TC2)	Exceeds IWRG621 Category C Upper Limits (TC1)	Exceeds IWRG621 Fill Material Upper Limits (TC0)																
Bromodichloromethane	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
Bromoform	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
Carbon Tetrachloride	mg/kg	0.01				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.01	-	-	-
Chlorodibromomethane	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
Chloroethane	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
Chloroform	mg/kg	0.02				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02	-	-	-
Chloromethane	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
cis-1,2-Dichloroethene	mg/kg	0.01				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.01	-	-	-
Dibromomethane	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
cis-1,3-Dichloropropene	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
Dichloromethane	mg/kg	0.4				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.4	-	-	-
Hexachlorobutadiene	mg/kg	0.02	11	2.8		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02	-	-	-
Tetrachloroethene	mg/kg	0.02				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02	-	-	-
trans-1,2-Dichloroethene	mg/kg	0.02				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02	-	-	-
trans-1,3-Dichloropropene	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
Trichloroethene	mg/kg	0.02				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02	-	-	-
Vinyl Chloride	mg/kg	0.02	4.8	1.2		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.02	-	-	-
Total Chlorinated Hydrocarbons	mg/kg	0.01			1	-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.01	-	-	-
Total Other Chlorinated Hydrocarbons	mg/kg	0.01	50	10		-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.01	-	-	-
PAHs																					
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	-	-	-
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	-	-	-
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	-	-	-
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	<0.5	<0.5	-	-	-
Benzo(a)pyrene	mg/kg	0.5	20	5	1	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Benzo(b+j)fluoranthene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-
Benzo(b+j+k)fluoranthene	mg/kg	0.5				-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-
Benzo(g,h,i)perylene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Benzo(k)fluoranthene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-
Chrysene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Fluoranthene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Fluorene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<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	<0.5	<0.5	-	-	-
Naphthalene	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	-	-	-
Phenanthrene	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	-	-	-
Pyrene	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	-	-	-
Benzo(a)pyrene TEQ (Zero)	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	-	-	-
Sum of Polycyclic aromatic hydrocarbons (PAH)	mg/kg	0.5	400	100	20	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
Phenols																					
2-Methylphenol	mg/kg	0.2				-	<0.2	-	-	-	-	<0.2	-	-	-	<0.2	<0.2	<1	-	-	-
2-Nitrophenol	mg/kg	1				-	<1	-	-	-	-	<1	-	-	-	<1	<1	<1	-	-	-
2,4-Dimethylphenol	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<1	-	-	-
2,4-Dinitrophenol	mg/kg	5				-	<5	-	-	-	-	<5	-	-	-	<5	<5	<5	-	-	-
3-&4-Methylphenol (m&p-cresol)	mg/kg	0.4				-	<0.4	-	-	-	-	<0.4	-	-	-	<0.4	<0.4	<1	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.03				-	<1	-	-	-	-	<1	-	-	-	<1	<1	<0.03	-	-	-
4-Nitrophenol	mg/kg	5				-	<5	-	-	-	-	<5	-	-	-	<5	<5	<5	-	-	-
4,6-Dinitro-2-methylphenol	mg/kg	5				-	<5	-	-	-	-	<5	-	-	-	<5	<5	<5	-	-	-
4,6-Dinitro-o-cyclohexyl phenol	mg/kg	5				-	<20	-	-	-	-	<20	-	-	-	<20	<20	<5	-	-	-
Phenol	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<1	-	-	-
Phenols (non-halogenated)	mg/kg	1	2200	560	60	-	<20	-	-	-	-	<20	-	-	-	<20	<20	<1	-	-	-
Halogenated Phenols																					
2,4,5-Trichlorophenol	mg/kg	0.05				-	<1	-	-	-	-	<1	-	-	-	<1	<1	<0.05	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.05				-	<1	-	-	-	-	<1	-	-	-	<1	<1	<0.05	-	-	-
2,4-Dichlorophenol	mg/kg	0.03				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.03	-	-	-
2,6-Dichlorophenol	mg/kg	0.03				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.03	-	-	-
2-Chlorophenol	mg/kg	0.03				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.03	-	-	-
Pentachlorophenol	mg/kg	0.2				-	<1	-	-	-	-	<1	-	-	-	<1	<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	-	-	-	-	<1	-	-	-	<1	<1	-	-	-	-
Phenols (Halogenated)	mg/kg	0.03	320	10	1	-	-	-	-	-	-	-	-	-	-	-	-	<0.03	-	-	-
Phenols (Total Halogenated)	mg/kg	1				-	<1	-	-	-	-	<1	-	-	-	<1	<1	-	-	-	-
Organochlorine Pesticides																					
a-BHC	mg/kg	0.03				-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03	-	-	-
b-BHC	mg/kg	0.03				-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03	-	-	-
d-BHC	mg/kg	0.03				-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03	-	-	-
g-BHC (Lindane)	mg/kg	0.03				-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03	-	-	-
Aldrin	mg/kg	0.03				-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03	-	-	-
Dieldrin	mg/kg	0.03				-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03	-	-	-
Aldrin + Dieldrin	mg/kg	0.03	4.8	1.2		-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03	-	-	-
Chlordane	mg/kg	0.03	16	4		-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	<0.03	-	-	-
DDT	mg/kg	0.05				-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	-	-	-
4,4-DDE	mg/kg	0.05				-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	-	-	-

Table 2: Soil Analytical Results vs. IWRG Threshold Limits
Preliminary Soil Contamination Assessment
T4 Elevated Road, Melbourne Airport
M16733

senversa

					Location Code		SB06			SB07						SS01	SS02
					Field ID	SB05_0.5-0.6	SB06_0.1-0.2	SB06_0.3-0.4	SB06_0.7-0.8	SB07_0.0-0.1	QA1	QA2	SB07_0.1-0.2	SB07_0.5-0.6	SB07_1.1-1.2	SS01	SS02
					Date	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018
					Depth	0.5 - 0.6	0.1 - 0.2	0.3 - 0.4	0.7 - 0.8	0 - 0.1	0 - 0.1	0 - 0.1	0.1 - 0.2	0.5 - 0.6	1.1 - 1.2		
					Sample Type	Normal	Normal	Normal	Normal	Normal	Field_D	Interlab_D	Normal	Normal	Normal	Normal	Normal
					Lab Report No.	608706	608706	608706	608706	608706	608706	EM1811718	608706	608706	608706	608706	608706
	Unit	EQL	Exceeds IWRG621 Category B Upper Limits (TC2)	Exceeds IWRG621 Category C Upper Limits (TC1)	Exceeds IWRG621 Fill Material Upper Limits (TC0)												
Bromodichloromethane	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Bromoform	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Carbon Tetrachloride	mg/kg	0.01				-	-	-	-	-	-	-	<0.5	-	-	-	-
Chlorodibromomethane	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Chloroethane	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Chloroform	mg/kg	0.02				-	-	-	-	-	-	-	<0.5	-	-	-	-
Chloromethane	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
cis-1,2-Dichloroethene	mg/kg	0.01				-	-	-	-	-	-	-	<0.5	-	-	-	-
Dibromomethane	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
cis-1,3-Dichloropropene	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Dichloromethane	mg/kg	0.4				-	-	-	-	-	-	-	<0.5	-	-	-	-
Hexachlorobutadiene	mg/kg	0.02	11	2.8		-	-	-	-	-	-	-	<0.5	-	-	-	-
Tetrachloroethene	mg/kg	0.02				-	-	-	-	-	-	-	<0.5	-	-	-	-
trans-1,2-Dichloroethene	mg/kg	0.02				-	-	-	-	-	-	-	<0.5	-	-	-	-
trans-1,3-Dichloropropene	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Trichloroethene	mg/kg	0.02				-	-	-	-	-	-	-	<0.5	-	-	-	-
Vinyl Chloride	mg/kg	0.02	4.8	1.2		-	-	-	-	-	-	-	<0.5	-	-	-	-
Total Chlorinated Hydrocarbons	mg/kg	0.01			1	-	-	-	-	-	-	-	<0.5	-	-	-	-
Total Other Chlorinated Hydrocarbons	mg/kg	0.01	50	10		-	-	-	-	-	-	-	<0.5	-	-	-	-
PAHs																	
Acenaphthene	mg/kg	0.5				<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Acenaphthylene	mg/kg	0.5				<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Anthracene	mg/kg	0.5				<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Benz(a)anthracene	mg/kg	0.5				<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Benzo(a)pyrene	mg/kg	0.5	20	5	1	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Benzo(b+j)fluoranthene	mg/kg	0.5				<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Benzo(b+j+k)fluoranthene	mg/kg	0.5				-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	0.5				<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Benzo(k)fluoranthene	mg/kg	0.5				<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Chrysene	mg/kg	0.5				<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5				<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Fluoranthene	mg/kg	0.5				<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Fluorene	mg/kg	0.5				<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5				<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Naphthalene	mg/kg	0.5				<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Phenanthrene	mg/kg	0.5				<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Pyrene	mg/kg	0.5				<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Benzo(a)pyrene TEQ (Zero)	mg/kg	0.5				<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Sum of Polycyclic aromatic hydrocarbons (PAH)	mg/kg	0.5	400	100	20	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	<0.5
Phenols																	
2-Methylphenol	mg/kg	0.2				-	-	-	-	-	-	-	<0.2	-	-	-	-
2-Nitrophenol	mg/kg	1				-	-	-	-	-	-	-	<1	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
2,4-Dinitrophenol	mg/kg	5				-	-	-	-	-	-	-	<5	-	-	-	-
3-&4-Methylphenol (m&p-cresol)	mg/kg	0.4				-	-	-	-	-	-	-	<0.4	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.03				-	-	-	-	-	-	-	<1	-	-	-	-
4-Nitrophenol	mg/kg	5				-	-	-	-	-	-	-	<5	-	-	-	-
4,6-Dinitro-2-methylphenol	mg/kg	5				-	-	-	-	-	-	-	<5	-	-	-	-
4,6-Dinitro-o-cyclohexyl phenol	mg/kg	5				-	-	-	-	-	-	-	<20	-	-	-	-
Phenol	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Phenols (non-halogenated)	mg/kg	1	2200	560	60	-	-	-	-	-	-	-	<20	-	-	-	-
Halogenated Phenols																	
2,4,5-Trichlorophenol	mg/kg	0.05				-	-	-	-	-	-	-	<1	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.05				-	-	-	-	-	-	-	<1	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.03				-	-	-	-	-	-	-	<0.5	-	-	-	-
2,6-Dichlorophenol	mg/kg	0.03				-	-	-	-	-	-	-	<0.5	-	-	-	-
2-Chlorophenol	mg/kg	0.03				-	-	-	-	-	-	-	<0.5	-	-	-	-
Pentachlorophenol	mg/kg	0.2				-	-	-	-	-	-	-	<1	-	-	-	-
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				-	-	-	-	-	-	-	<1	-	-	-	-
Phenols (Halogenated)	mg/kg	0.03	320	10	1	-	-	-	-	-	-	-	-	-	-	-	-
Phenols (Total Halogenated)	mg/kg	1				-	-	-	-	-	-	-	<1	-	-	-	-
Organochlorine Pesticides																	
a-BHC	mg/kg	0.03				-	-	-	-	-	-	-	<0.05	-	-	-	-
b-BHC	mg/kg	0.03				-	-	-	-	-	-	-	<0.05	-	-	-	-
d-BHC	mg/kg	0.03				-	-	-	-	-	-	-	<0.05	-	-	-	-
g-BHC (Lindane)	mg/kg	0.03				-	-	-	-	-	-	-	<0.05	-	-	-	-
Aldrin	mg/kg	0.03				-	-	-	-	-	-	-	<0.05	-	-	-	-
Dieldrin	mg/kg	0.03				-	-	-	-	-	-	-	<0.05	-	-	-	-
Aldrin + Dieldrin	mg/kg	0.03	4.8	1.2		-	-	-	-	-	-	-	<0.05	-	-	-	-
Chlordane	mg/kg	0.03	16	4		-	-	-	-	-	-	-	<0.1	-	-	-	-
DDT	mg/kg	0.05				-	-	-	-	-	-	-	<0.05	-	-	-	-
4,4-DDE	mg/kg	0.05				-	-	-	-	-	-	-	<0.05	-	-	-	-

Table 2: Soil Analytical Results vs. IWRG Threshold Limits
Preliminary Soil Contamination Assessment
T4 Elevated Road, Melbourne Airport
M16733

senversa

Location Code	Unit	EQL	Exceeds IWRG621 Category B Upper Limits (TC2)	Exceeds IWRG621 Category C Upper Limits (TC1)	Exceeds IWRG621 Fill Material Upper Limits (TC0)	SB01			SB02		SB03			SB04		SB05					
Field ID						SB01_0.0-0.1	SB01_0.4-0.5	SB01_1.1-1.2	SB02_0.1-0.2	SB02_0.3-0.4	SB03_0.1-0.2	SB03_0.2-0.3	SB03_1.6-1.7	SB04_0.1-0.2	SB04_1.0-1.1	SB05_0.1-0.2	QA5	QA6	SB05_0.3-0.4	QA3	QA4
Date						19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018
Depth						0 - 0.1	0.4 - 0.5	1.1 - 1.2	0.1 - 0.2	0.3 - 0.4	0.1 - 0.2	0.2 - 0.3	1.6 - 1.7	0.1 - 0.2	1 - 1.1	0.1 - 0.2	0.1 - 0.2	0.1 - 0.2	0.3 - 0.4	0.3 - 0.4	0.3 - 0.4
Sample Type						Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Field_D	Interlab_D	Normal	Field_D	Interlab_D
Lab Report No.						608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	608706	EM1811718	608706	608706	EM1811718
DDD	mg/kg	0.05				-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	-	-	-
DDT+DDE+DDD	mg/kg	0.05	50	50		-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	-	-	-
Endosulfan I	mg/kg	0.03				-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03	-	-	-
Endosulfan II	mg/kg	0.03				-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03	-	-	-
Endosulfan sulfate	mg/kg	0.03				-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03	-	-	-
Endrin	mg/kg	0.03				-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03	-	-	-
Chlordane (cis)	mg/kg	0.03				-	-	-	-	-	-	-	-	-	-	-	-	<0.03	-	-	-
Chlordane (trans)	mg/kg	0.03				-	-	-	-	-	-	-	-	-	-	-	-	<0.03	-	-	-
Endrin aldehyde	mg/kg	0.03				-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03	-	-	-
Endrin ketone	mg/kg	0.05				-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	-	-	-	-
Heptachlor	mg/kg	0.03	4.8	1.2		-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03	-	-	-
Heptachlor epoxide	mg/kg	0.03				-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03	-	-	-
Methoxychlor	mg/kg	0.03				-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03	-	-	-
Toxaphene	mg/kg	1				-	<1	-	-	-	-	<1	-	-	-	<1	<1	-	-	-	-
Organochlorine Pesticides (EPAVic)	mg/kg	0.03			1	-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	<0.03	-	-	-
Other Organochlorine Pesticides (EPAVic)	mg/kg	0.03	50	10		-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	<0.03	-	-	-
Herbicides																					
Dinoseb	mg/kg	5				-	<20	-	-	-	-	<20	-	-	-	<20	<20	<5	-	-	-
Fungicides																					
Hexachlorobenzene	mg/kg	0.03				-	<0.05	-	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.03	-	-	-
Polychlorinated Biphenyls																					
Aroclor 1016	mg/kg	0.1				-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	-	-	-	-
Aroclor 1221	mg/kg	0.1				-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	-	-	-	-
Aroclor 1232	mg/kg	0.1				-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	-	-	-	-
Aroclor 1242	mg/kg	0.1				-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	-	-	-	-
Aroclor 1248	mg/kg	0.1				-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	-	-	-	-
Aroclor 1254	mg/kg	0.1				-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	-	-	-	-
Aroclor 1260	mg/kg	0.1				-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1			2	-	<0.1	-	-	-	-	<0.1	-	-	-	<0.1	<0.1	<0.1	-	-	-
Solvents																					
Methyl Ethyl Ketone (MEK)	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
4-Methyl-2-pentanone	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
Acetone	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
Allyl chloride	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-
Carbon disulfide	mg/kg	0.5				-	<0.5	-	-	-	-	<0.5	-	-	-	<0.5	<0.5	-	-	-	-

Comments

#1 Soils with a pH value of 2 or less or a pH of 12.5 or more are considered to be Category A Prescribed Industrial Wastes.

#2 Soils with a pH value of 4 or less or a pH of 9 or more are considered to be a Prescribed Industrial Waste.

Table 2: Soil Analytical Results vs. IWRG Threshold Limits
Preliminary Soil Contamination Assessment
T4 Elevated Road, Melbourne Airport
M16733

senversa

					Location Code		SB06			SB07						SS01	SS02
					Field ID	SB05_0.5-0.6	SB06_0.1-0.2	SB06_0.3-0.4	SB06_0.7-0.8	SB07_0.0-0.1	QA1	QA2	SB07_0.1-0.2	SB07_0.5-0.6	SB07_1.1-1.2	SS01	SS02
					Date	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018
					Depth	0.5 - 0.6	0.1 - 0.2	0.3 - 0.4	0.7 - 0.8	0 - 0.1	0 - 0.1	0 - 0.1	0.1 - 0.2	0.5 - 0.6	1.1 - 1.2		
					Sample Type	Normal	Normal	Normal	Normal	Normal	Field_D	Interlab_D	Normal	Normal	Normal	Normal	Normal
					Lab Report No.	608706	608706	608706	608706	608706	608706	EM1811718	608706	608706	608706	608706	608706
	Unit	EQL	Exceeds IWRG621 Category B Upper Limits (TC2)	Exceeds IWRG621 Category C Upper Limits (TC1)	Exceeds IWRG621 Fill Material Upper Limits (TC0)												
DDD	mg/kg	0.05				-	-	-	-	-	-	-	<0.05	-	-	-	-
DDT+DDE+DDD	mg/kg	0.05	50	50		-	-	-	-	-	-	-	<0.05	-	-	-	-
Endosulfan I	mg/kg	0.03				-	-	-	-	-	-	-	<0.05	-	-	-	-
Endosulfan II	mg/kg	0.03				-	-	-	-	-	-	-	<0.05	-	-	-	-
Endosulfan sulfate	mg/kg	0.03				-	-	-	-	-	-	-	<0.05	-	-	-	-
Endrin	mg/kg	0.03				-	-	-	-	-	-	-	<0.05	-	-	-	-
Chlordane (cis)	mg/kg	0.03				-	-	-	-	-	-	-	-	-	-	-	-
Chlordane (trans)	mg/kg	0.03				-	-	-	-	-	-	-	-	-	-	-	-
Endrin aldehyde	mg/kg	0.03				-	-	-	-	-	-	-	<0.05	-	-	-	-
Endrin ketone	mg/kg	0.05				-	-	-	-	-	-	-	<0.05	-	-	-	-
Heptachlor	mg/kg	0.03	4.8	1.2		-	-	-	-	-	-	-	<0.05	-	-	-	-
Heptachlor epoxide	mg/kg	0.03				-	-	-	-	-	-	-	<0.05	-	-	-	-
Methoxychlor	mg/kg	0.03				-	-	-	-	-	-	-	<0.05	-	-	-	-
Toxaphene	mg/kg	1				-	-	-	-	-	-	-	<1	-	-	-	-
Organochlorine Pesticides (EPAVic)	mg/kg	0.03			1	-	-	-	-	-	-	-	<0.1	-	-	-	-
Other Organochlorine Pesticides (EPAVic)	mg/kg	0.03	50	10		-	-	-	-	-	-	-	<0.1	-	-	-	-
Herbicides																	
Dinoseb	mg/kg	5				-	-	-	-	-	-	-	<20	-	-	-	-
Fungicides																	
Hexachlorobenzene	mg/kg	0.03				-	-	-	-	-	-	-	<0.05	-	-	-	-
Polychlorinated Biphenyls																	
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			2	-	-	-	-	-	-	-	<0.1	-	-	-	-
Solvents																	
Methyl Ethyl Ketone (MEK)	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
4-Methyl-2-pentanone	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Acetone	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Allyl chloride	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-
Carbon disulfide	mg/kg	0.5				-	-	-	-	-	-	-	<0.5	-	-	-	-

Comments

#1 Soils with a pH value of 2 or less or a pH of 12.5 or more are considered to be Category A Prescribed Industrial Wastes.

#2 Soils with a pH value of 4 or less or a pH of 9 or more are considered to be a Prescribed Industrial Waste.

Table 3: Soil Leachability Results vs. IWRG Threshold Limits
Preliminary Soil Contamination Assessment
T4 Elevated Road, Melbourne Airport
M16733

senversa

				Location Code	SB01	SB02	SB04		SS02
				Field ID	SB01_0.4-0.5	SB02_0.1-0.2	SB04_0.1-0.2	SB04_1.0-1.1	SS02
				Date	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018
				Depth	0.4 - 0.5	0.1 - 0.2	0.1 - 0.2	1 - 1.1	
				Sample Type	Normal	Normal	Normal	Normal	Normal
				Lab Report No.	609847	609847	609847	609847	609847
	Unit	EQL	Exceeds IWRG621 Category B Upper Limits (ASLP2)	Exceeds IWRG621 Category C Upper Limits (ASLP1)					
Physical Parameters									
pH of Leaching Fluid	pH Units	0.1			5.1	5.1	5.1	5.1	5.1
pH (Final)	pH Units	0.1			5.6	5.3	5.2	6.8	5.2
Metals									
Arsenic	mg/L	0.01	2.8	0.7	<0.01	-	<0.01	<0.01	-
Nickel	mg/L	0.01	8	2	-	0.04	-	-	-
Zinc	mg/L	0.01	1200	300	-	-	-	-	0.71

Table 4: PFAS Analytical Results vs. Screening Criteria for Disposal
Preliminary Soil Contamination Assessment
T4 Elevated Road, Melbourne Airport
M16733

senversa

			Location Code	SB01		SB02				SB04						SB07				SS01	SS02
			Field ID	SB01_0.0-0.1	SB01_0.4-0.5	SB02_0.1-0.2	SB02_0.3-0.4	SB03_0.2-0.3	SB03_1.6-1.7	SB04_0.1-0.2	SB05_0.3-0.4	QA3	QA4	SB06_0.3-0.4	SB06_0.7-0.8	SB07_0.0-0.1	QA1	QA2	SB07_1.1-1.2	SS01	SS02
			Date	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018
			Depth	0 - 0.1	0.4 - 0.5	0.1 - 0.2	0.3 - 0.4	0.2 - 0.3	1.6 - 1.7	0.1 - 0.2	0.3 - 0.4	0.3 - 0.4	0.3 - 0.4	0.3 - 0.4	0.7 - 0.8	0 - 0.1	0 - 0.1	0 - 0.1	1.1 - 1.2		
			Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Field_D	Interlab_D	Normal	Normal	Normal	Field_D	Interlab_D	Normal	Normal	Normal
			Lab Report No.	608706	608706	608706	608706	608706	608706	608706	608706	608706	EM1811718	608706	608706	608706	608706	EM1811718	608706	608706	608706
	Unit	EQL	Interim landfill acceptance criteria - unlined (HEPA 2018)																		
Physical Parameters																					
Moisture Content	%	0.1		3.9	4.9	6.8	4.7	9.6	17	3.0	12	9.9	11.4	15	15	11	5.9	8.4	18	4.6	20
pH (aqueous extract)	pH Units	0.1		-	8.5	-	-	7.7	-	-	-	-	-	-	-	-	-	-	-	-	-
(n:2) Fluorotelomer Sulfonic Acids																					
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	<0.005	<0.005
6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.0005		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.0005	<0.01	<0.01	<0.01	<0.01	<0.0005	<0.01	<0.01	<0.01
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	<0.005	<0.005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	<0.005	<0.005
Perfluoroalkane Carboxylic Acids																					
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005
Perfluorononanoic acid (PFNA)	mg/kg	0.0002		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005
Perfluorobutanoic acid (PFBA)	mg/kg	0.001		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.005	<0.005	<0.005	<0.005	<0.001	<0.005	<0.005	<0.005
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	<0.005	<0.005
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	50[#1]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005
Perfluoroalkane Sulfonic Acids																					
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005
Perfluorooctanesulfonic acid (PFOS)	mg/kg	0.0002		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0005	<0.005	<0.005	<0.005	<0.005	0.0003	<0.005	<0.005	0.0052
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.0002		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005
Sum of PFHxS and PFOS	mg/kg	0.0002	20[#1]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0005	<0.005	<0.005	<0.005	<0.005	0.0003	<0.005	<0.005	0.0052
Perfluoroalkyl Sulfonamides																					
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	<0.005	<0.005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	<0.005	<0.005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	<0.005	<0.005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	<0.005	<0.005
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005	<0.005	<0.0002	<0.005	<0.005	<0.005
N-ethyl-perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	mg/kg	0.0002		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.0002	<0.01	<0.01	<0.01	<0.01	<0.0002	<0.01	<0.01	<0.01
N-methylperfluorooctane sulfonamidoacetic acid (NMeFOSAA)	mg/kg	0.0002		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.0002	<0.01	<0.01	<0.01	<0.01	<0.0002	<0.01	<0.01	<0.01
PFAS																					
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	mg/kg	0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	0.0052
Sum of US EPA PFAS (PFOS + PFOA)*	mg/kg	0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	-	<0.005	<0.005	0.0052
Sum of PFAS	mg/kg	0.0002		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.0005	<0.05	<0.05	<0.05	<0.05	0.0003	<0.05	<0.05	<0.05
Sum of PFAS (WA DER List)	mg/kg	0.0002		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0005	<0.01	<0.01	<0.01	<0.01	0.0003	<0.01	<0.01	<0.01

Comments

#1 PFAS National Environmental Management Plan (January 2018) - The landfill acceptance criteria have not been endorsed by EPA Victoria and are for screening purposes only.

Table 5: PFAS Leachability Results vs. Screening Criteria for Disposal
Preliminary Soil Contamination Assessment
T4 Elevated Road, Melbourne Airport
M16733

	Unit	EQL	Interim landfill acceptance criteria - unlined (HEPA 2018)					
			Location Code	SB01		SB04		SS02
			Field ID	SB01_0.4-0.5	SB01_1.1-1.2	SB04_0.1-0.2	SB04_1.0-1.1	SS02
			Date	19/07/2018	19/07/2018	19/07/2018	19/07/2018	19/07/2018
			Depth	0.4 - 0.5	1.1 - 1.2	0.1 - 0.2	1 - 1.1	
			Sample Type	Normal	Normal	Normal	Normal	Normal
			Lab Report No.	609847	609847	609847	609847	609847
Physical Parameters								
pH of Leaching Fluid	pH Units	0.1		5.1	5.1	5.1	5.1	5.1
pH (Final)	pH Units	0.1		5.6	5.8	5.2	6.8	5.2
(n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroalkane Carboxylic Acids								
Perfluorohexanoic acid (PFHxA)	µg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	µg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorobutanoic acid (PFBA)	µg/L	0.05		<0.05	<0.05	<0.05	<0.05	<0.05
Perfluoropentanoic acid (PFPeA)	µg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecanoic acid (PFDA)	µg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic acid (PFOA)	µg/L	0.01	0.56[#1]	<0.01	<0.01	<0.01	<0.01	0.01
Perfluoroalkane Sulfonic Acids								
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.01		0.02	<0.01	<0.01	<0.01	0.05
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	µg/L	0.01	0.07[#1]	0.02	<0.01	<0.01	<0.01	0.05
Perfluoroalkyl Sulfonamides								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05		<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorooctane sulfonamide (FOSA)	µg/L	0.05		<0.05	<0.05	<0.05	<0.05	<0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	µg/L	0.05		<0.05	<0.05	<0.05	<0.05	<0.05
N-methylperfluorooctane sulfonamidoacetic acid (NMeFOSAA)	µg/L	0.05		<0.05	<0.05	<0.05	<0.05	<0.05
PFAS								
Sum of US EPA PFAS (PFOS + PFOA)*	µg/L	0.01		0.02	<0.01	<0.01	<0.01	0.06
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	µg/L	0.01		0.02	<0.01	<0.01	<0.01	0.06
Sum of PFAS	µg/L	0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Sum of PFAS (WA DER List)	µg/L	0.05		<0.05	<0.05	<0.05	<0.05	0.06

Comments

#1 PFAS National Environmental Management Plan (January 2018) - The landfill acceptance criteria have not been endorsed by EPA Victoria and are for screening purposes o

Appendix A: Quality Assurance / Quality Control

Appendix A: 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
Standard Procedures	Comparability, Reproducibility, Representativeness	Standard field sampling procedures and forms used	No deviation from standard procedure and forms used
Equipment Calibration	Accuracy	All equipment calibrated in accordance with manufacturers specifications	All equipment calibrated in accordance with manufacturers specifications
Testing Method Accreditation	Accuracy and Comparability	NATA accredited methods used for all analyses determined	Primary and secondary laboratories to use NATA accredited methods for all analytes determined
Quality Control Sampling Frequency	Precision and Repeatability	Field QC sampling frequency in accordance with AS4482.1-2005	Field Duplicates – ≥ 1 in 20 primary samples Secondary Duplicates – ≥ 1 in 20 primary samples Rinsate Blanks – ≥ 1 per day, per matrix per equipment Trip Blanks – ≥ 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
Sample Preservation, Handling and Holding Times	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.
Data Management	Accuracy	No errors in data transcription	Entry of field data verified by peer.
Data Useability	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
Field Duplicate Sampling and Analysis	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[1] <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

[1] 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
Secondary Duplicate Sampling and Analysis	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
Field Rinsate Blank Preparation and Analysis	Accuracy and Representativeness	Cross contamination of samples does not occur between sampling locations due to carry-over from sampling equipment. 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.	Analyte concentrations below limits of reporting
Trip Blank Sampling and Analysis	Accuracy and Representativeness	Cross contamination between samples does not occur in transit or as an artefact of the sample handling procedure. 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.	Analyte concentrations below limits of reporting
Laboratory QC Analysis	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 table.

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

Quality Control Sample Frequency

Quality control samples were collected in accordance with AS4482.1-2005 and the *PFAS National Environmental Management Plan,* with the following exceptions:

- Trip blank samples were not used or analysed as no volatile contaminants were present.
- Rinsate blanks were collected but not analysed, as there is no evidence of cross-contamination between sample locations.

Matrix Spike Recoveries

The matrix spike recoveries for Cyanide (total) and Fluoride were below acceptable limits. Recoveries for all other matrix spikes analysed for by the laboratory were within acceptable limits. This suggests that these results maybe under reported.

Laboratory Duplicates

RPDs for laboratory duplicate samples analysed for TRH C29-C36 and Cyanide (total) exceeded acceptable limits. RPDs for all other laboratory duplicates analysed were within acceptable limits.

Field Duplicate RPDs

Primary sample SB05_0.1-0.2 and inter-laboratory duplicate QA6 exceeded the RPD acceptance criteria for Fluoride. This variability is considered to be due to the heterogeneity of fill material sampled. While care was taken to minimise the heterogeneity when splitting the samples into duplicates, complete homogeneity cannot be achieved.

Data Useability

The secondary laboratory reported detectable PFOS concentrations above the laboratory detection limits, but below the primary laboratories detection limits. Whilst this suggests that very low PFAS impacts are potentially present, the primary laboratory consistently reported concentrations below the Euorfins standard detection limits in the natural soils and fill soils beneath the paved areas of the site.

Taking the above into consideration, Senversa considers the natural soils and fill soils beneath the paved areas of the site to be “Non-PFAS Impacted” and can be treated accordingly. Should the materials be transported off-site, confirmatory testing should be undertaken on stockpiled material and all results should be disclosed to the receiving licenced facility for approval before accepting the waste.

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 at the site.

Data Validation Checklist

Job Number:	M16733
Report Title:	Preliminary Soil Contamination Assessment
Client:	Arup
Completed By:	Sam O'Connor
Date:	6-Aug-18
Verified By:	Richard Griffin
Date:	7-Aug-18

SAMPLE DELIVERY GROUP (SDG):	**608706**	**SAMPLE DELIVERY GROUP (SDG):**	**EM1811718**	**SAMPLE DELIVERY GROUP (SDG):**	**609947**
Laboratory:	Eurofins	**Laboratory:**	ALS	**Laboratory:**	Eurofins
Sample Dates:	19-Jul-18	**Sample Dates:**	19-Jul-18	**Sample Dates:**	19-Jul-18
Sample Media:	Soil	**Sample Media:**	Soil	**Sample Media:**	Soil Leachate

Quality Assurance Process	**Objectives & Measure**	**Acceptance Criteria**	**Source of Information**	**Acceptance Criteria Met?**	**Notes/Details of Nonconformance**	**Acceptance Criteria Met?**	**Notes/Details of Nonconformance**	**Acceptance Criteria Met?**	**Notes/Details of Nonconformance**
Standard Procedures	Standard field sampling procedures and forms used	No deviation from standard procedure and forms used.	Borelogs, field sheets, COCs, data tables	Yes		Yes		N/A	
Equipment Calibration	All equipment calibrated in accordance with manufacturers specifications	All equipment calibrated in accordance with manufacturers specifications.	Calibration Certificates / Records	N/A		N/A		N/A	
Testing Method Accreditation	NATA accredited methods used for all analyses determined	Primary and secondary laboratories to use NATA accredited methods for all analytes determined.	Laboratory Report	Yes		Yes		Yes	
Quality Control Sampling Frequency	Field QC sampling frequency in accordance with AS4482.1-2005	Field Duplicates - ≥ 1 in 20 primary samples.	QA/QC register (within field book)	Yes		Yes		N/A	
		Secondary Duplicates - ≥ 1 in 20 primary samples.	QA/QC register (within field book)	Yes		Yes		N/A	
		Rinsate Blanks - ≥ 1 per day, per matrix per equipment.	QA/QC register (within field book)	No	Rinsate blank was collected but not analysed for.	N/A		N/A	
		Trip Blanks - ≥ 1 per esky containing samples for volatiles.	QA/QC register (within field book)	Yes	Trip blanks were not collected for this investigation, as VOCs were not a primary contaminant of concern.	N/A		N/A	
	Laboratory QC analysis frequency in accordance with NEPC 2013	Laboratory Duplicates - at least 1 in 10 analyses or 1 per process batch.	Laboratory Reports	Yes		Yes		Yes	
		Method Blanks - at least 1 per process batch.	Laboratory Reports	Yes		Yes		Yes	
		Surrogate Recoveries - all samples spiked where appropriate (e.g. chromatographic analysis of organics).	Laboratory Reports	Yes		Yes		Yes	
		Laboratory Control Samples - at least 1 per process batch.	Laboratory Reports	Yes		Yes		Yes	
		Matrix Spikes - at least 1 per matrix type per process batch.	Laboratory Reports	Yes		Yes		Yes	
Sample Preservation, Handling and Holding Times	Samples appropriately preserved upon collection, stored and transported, and analysed within holding times	In accordance with laboratory specific method requirements. Unless specific method indicates otherwise, soil and water samples should be stored, transported and received by the laboratory at < 6°C.	Laboratory Reports	Yes		Yes		Yes	
Data Management	No errors in data transcription	Entry of field data verified by peer.	10% check of electronically imported data (e.g. ESDAT). 100% check of manually entered data (e.g. field parameters, gauging data). Evidence of checks recorded in project file.	Yes		Yes		Yes	
Data Useability	Limits of reporting less than investigation levels	Limits of reporting less than relevant investigation levels.	Results Tables	Yes		Yes		Yes	

Quality Control Process	**Objectives & Measure**	**Acceptance Criteria**	**How? (i.e. ESDAT output, review lab reports, review data**	**Acceptance Criteria Met?**	**Notes/Details of Nonconformance**	**Acceptance Criteria Met?**	**Notes/Details of Nonconformance**	**Acceptance Criteria Met?**	**Notes/Details of Nonconformance**
Field Duplicate (intralaboratory field duplicate) Sampling and Analysis	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 precision level of precision.	Analysed for same chemicals as primary sample. RPD <30% of mean conc. where both conc. >20 x LOR RPD <50% of mean conc. where both conc. 10-20 x LOR RPD No limit where both conc. < 10 x LOR	ESDAT generated summary of relative percent difference (RPD) results for field duplicate samples.	Yes	See RPD table attached.	Yes	See RPD table attached.	Yes	
Secondary Duplicate (interlaboratory field duplicate) Sampling and Analysis	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 conc. where both conc. >20 x LOR. RPD <50% of mean conc. where both conc. 10-20 x LOR. RPD no limit where both conc. < 10 x LOR.	ESDAT generated summary of relative percent difference (RPD) results for field duplicate samples.	Yes	RPD between QA6 and SB05_0.1-0.2 for Fluoride exceeded acceptable limits. This variability is considered to be due to the heterogeneity of fill material sampled. See RPD table attached.	N/A	RPD between QA6 and SB05_0.1-0.2 for Fluoride exceeded acceptable limits. This variability is considered to be due to the heterogeneity of fill material sampled. See RPD table attached.	N/A	
Field Rinsate Blank Preparation & Analysis	Cross contamination of samples does not occur between sampling locations due to carry-over from sampling equipment.	Analyte concentrations below LORs.	ESDAT generated summary of field blank analytical results.	N/A	Rinsate blank was not analysed.	N/A		N/A	
Trip Blank Sampling and Analysis	Cross contamination between samples does not occur in transit or as an artefact of the sampling handling procedure.	Analyte concentrations below LORs.	ESDAT generated summary of field blank analytical results.	N/A	No trip blank collected or analysed.	N/A		N/A	
Laboratory Duplicates	Laboratory duplicates are used to test the precision of the laboratory measurements.	As specified by laboratory.	Laboratory reports	Yes	RPDs for laboratory duplicate samples analysed for TRH C29-C36 and Cyanide (total) exceeded acceptable limits. RPDs for all other laboratory duplicates analysed were within acceptable limits.	Yes		Yes	
Laboratory Control Samples	Laboratory control samples (LCS) are used to assess overall method performance. In general these samples are similar in composition to environmental samples, and contain known amounts of the analytes of interest.	Dynamic recovery limits as specified by laboratory.	Laboratory reports	Yes		Yes		Yes	
Certified Reference Material	CRM samples are used to monitor the accuracy of analyses performed by the laboratory.	As specified by laboratory (generally dynamic recovery limits). Usually not performed and assessed based on LCS results.	Laboratory reports	N/A		N/A		N/A	
Surrogate Recovery	Surrogates are organic compounds that are similar in chemical composition to analytes of interest and are spiked into environmental samples prior to sample preparation and analysis. Surrogate recoveries are used to evaluate matrix interference on a sample-specific basis.	Dynamic recovery limits as specified by laboratory.	Laboratory reports	Yes		Yes		Yes	
Matrix Spike Recovery	A matrix spike is an aliquot of a sample spiked with a known concentration of target analyte(s). Spiking occurs prior to sample preparation and analysis, and the results are used to assess the bias of a method in a given sample matrix.	Recovery 70 - 130% or dynamic limits if specified by laboratory.	Laboratory reports	Yes	The matrix spike recoveries for Cyanide (total) and Fluoride were below acceptable limits.	Yes		Yes	
Laboratory Method Blanks	Method blanks are prepared to represent the sample matrix as closely as possible and prepared/extracted/digested and analysed exactly like field samples. These blanks are used by the laboratory to assess contamination introduced during sample preparation activities.	Analyte concentrations below LORs.	Laboratory reports	Yes		Yes		Yes	
Potentially Anomolous Data				N/A		N/A		N/A	

Table A-1: Analytical ResultsM16733
,

senversa

		Location Code	SB05	SB05		SB05	SB05		SB05	SB05		SB05	SB05		SB07	SB07		SB07	SB07	
		Field ID	SB05_0.1-0.2	QA5		SB05_0.1-0.2	QA6		SB05_0.3-0.4	QA3		SB05_0.3-0.4	QA4		SB07_0.0-0.1	QA1		SB07_0.0-0.1	QA2	
		Date	19/07/2018	19/07/2018		19/07/2018	19/07/2018		19/07/2018	19/07/2018		19/07/2018	19/07/2018		19/07/2018	19/07/2018		19/07/2018	19/07/2018	
		Sample Type	Normal	Field_D		Normal	Interlab_D		Normal	Field_D		Normal	Interlab_D		Normal	Field_D		Normal	Interlab_D	
		Lab Report No.	608706	608706	RPD	608706	EM1811718	RPD	608706	608706	RPD	608706	EM1811718	RPD	608706	608706	RPD	608706	EM1811718	RPD
	Unit	EQL																		
Physical Parameters																				
Moisture Content	%	0.1	2.8	2.0	33	2.8	1.8	43	12	9.9	19	12	11.4	5	11	5.9	60	11	8.4	27
pH (aqueous extract)	pH Units	0.1	7.9	7.8	1	7.9	7.6	4	-	-	-	-	-	-	-	-	-	-	-	-
Inorganics																				
Cyanide Total	mg/kg	1	<5	<5	0	<5	<1	0	-	-	-	-	-	-	-	-	-	-	-	-
Fluoride	mg/kg	40	190	150	24	190	620	106	-	-	-	-	-	-	-	-	-	-	-	-
Metals																				
Arsenic	mg/kg	2	16	19	17	16	20	22	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/kg	0.4	<0.4	<0.4	0	<0.4	<1	0	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	mg/kg	5	37	32	14	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	mg/kg	5	20	17	16	20	16	22	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	5	<5	<5	0	<5	<5	0	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	mg/kg	2	<5	<5	0	<5	<2	0	-	-	-	-	-	-	-	-	-	-	-	-
Chromium(VI)	mg/kg	0.5	<1	<1	0	<1	<0.5	0	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	mg/kg	2	19	17	11	19	16	17	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	mg/kg	2	<2	<2	0	<2	<5	0	-	-	-	-	-	-	-	-	-	-	-	-
Silver	mg/kg	0.2	<0.2	<0.2	0	<0.2	<2	0	-	-	-	-	-	-	-	-	-	-	-	-
Tin	mg/kg	5	<10	<10	0	<10	<5	0	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	mg/kg	5	67	58	14	67	47	35	-	-	-	-	-	-	-	-	-	-	-	-
BTEX																				
Benzene	mg/kg	0.1	<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	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	0.1	<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	-	-	-	-	-	-	-	-	-	-	-	-
Xylene (o)	mg/kg	0.1	<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	-	-	-	-	-	-	-	-	-	-	-	-
Total Petroleum Hydrocarbons																				
C6-C9 Fraction	mg/kg	10	<20	<20	0	<20	<10	0	-	-	-	-	-	-	-	-	-	-	-	-
C10-C14 Fraction	mg/kg	20	<20	<20	0	<20	<50	0	-	-	-	-	-	-	-	-	-	-	-	-
C15-C28 Fraction	mg/kg	50	<50	<50	0	<50	<100	0	-	-	-	-	-	-	-	-	-	-	-	-
C29-C36 Fraction	mg/kg	50	<50	<50	0	<50	<100	0	-	-	-	-	-	-	-	-	-	-	-	-
C10-C36 Fraction (Sum)	mg/kg	50	<50	<50	0	<50	<50	0	-	-	-	-	-	-	-	-	-	-	-	-
Total Recoverable Hydrocarbons																				
C6-C10 Fraction	mg/kg	10	<20	<20	0	<20	<10	0	-	-	-	-	-	-	-	-	-	-	-	-
C6-C10 Fraction minus BTEX (F1)	mg/kg	10	<20	<20	0	<20	<10	0	-	-	-	-	-	-	-	-	-	-	-	-
>C10-C16 Fraction	mg/kg	50	<50	<50	0	<50	<50	0	-	-	-	-	-	-	-	-	-	-	-	-
>C10-C16 Fraction minus naphthalene (F2)	mg/kg	50	<50	<50	0	<50	<50	0	-	-	-	-	-	-	-	-	-	-	-	-
>C16-C34 Fraction	mg/kg	100	<100	<100	0	<100	<100	0	-	-	-	-	-	-	-	-	-	-	-	-
>C34-C40 Fraction	mg/kg	100	<100	<100	0	<100	<100	0	-	-	-	-	-	-	-	-	-	-	-	-
>C10-C40 Fraction (Sum)	mg/kg	50	-	-	-	-	<50	-	-	-	-	-	-	-	-	-	-	-	-	-
MAH																				
1,2,4-Trimethylbenzene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	-	-	-	-	-	-	-	-	-	-	-	-
Total MAH	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Monocylic Aromatic Hydrocarbons	mg/kg	0.2	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-
Halogenated Benzenes																				
1,2-Dichlorobenzene	mg/kg	0.02	<0.5	<0.5	0	<0.5	<0.02	0	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.01	<0.5	<0.5	0	<0.5	<0.01	0	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.02	<0.5	<0.5	0	<0.5	<0.02	0	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorotoluene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromobenzene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/kg	0.02	<0.5	<0.5	0	<0.5	<0.02	0	-	-	-	-	-	-	-	-	-	-	-	-
Halogenated Hydrocarbons																				
1,2-Dibromoethane	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iodomethane	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorinated Hydrocarbons																				
1,1-Dichloroethane	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	mg/kg	0.01	<0.5	<0.5	0	<0.5	<0.01	0	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1,2-Tetrachloroethane	mg/kg	0.01	<0.5	<0.5	0	<0.5	<0.01	0	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	mg/kg	0.01	<0.5	<0.5	0	<0.5	<0.01	0	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	mg/kg	0.04	<0.5	<0.5	0	<0.5	<0.04	0	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/kg	0.02	<0.5	<0.5	0	<0.5	<0.02	0	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	mg/kg	0.02	<0.5	<0.5	0	<0.5	<0.02	0	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichloropropane	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromochloromethane	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	mg/kg	0.01	<0.5	<0.5	0	<0.5	<0.01	0	-	-	-	-	-	-	-	-	-	-	-	-
Chlorodibromomethane	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A-1: Analytical ResultsM16733

,

		Location Code	SB05	SB05		SB05	SB05		SB05	SB05		SB05	SB05		SB07	SB07		SB07	SB07	
		Field ID	SB05_0.1-0.2	QA5		SB05_0.1-0.2	QA6		SB05_0.3-0.4	QA3		SB05_0.3-0.4	QA4		SB07_0.0-0.1	QA1		SB07_0.0-0.1	QA2	
		Date	19/07/2018	19/07/2018		19/07/2018	19/07/2018		19/07/2018	19/07/2018		19/07/2018	19/07/2018		19/07/2018	19/07/2018		19/07/2018	19/07/2018	
		Sample Type	Normal	Field_D		Normal	Interlab_D		Normal	Field_D		Normal	Interlab_D		Normal	Field_D		Normal	Interlab_D	
		Lab Report No.	608706	608706	RPD	608706	EM1811718	RPD	608706	608706	RPD	608706	EM1811718	RPD	608706	608706	RPD	608706	EM1811718	RPD
	Unit	EQL																		
Chloroethane	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/kg	0.02	<0.5	<0.5	0	<0.5	<0.02	0	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	mg/kg	0.01	<0.5	<0.5	0	<0.5	<0.01	0	-	-	-	-	-	-	-	-	-	-	-	-
Dibromomethane	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	mg/kg	0.4	<0.5	<0.5	0	<0.5	<0.4	0	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.02	<0.5	<0.5	0	<0.5	<0.02	0	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	mg/kg	0.02	<0.5	<0.5	0	<0.5	<0.02	0	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	mg/kg	0.02	<0.5	<0.5	0	<0.5	<0.02	0	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	mg/kg	0.02	<0.5	<0.5	0	<0.5	<0.02	0	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	mg/kg	0.02	<0.5	<0.5	0	<0.5	<0.02	0	-	-	-	-	-	-	-	-	-	-	-	-
Total Chlorinated Hydrocarbons	mg/kg	0.01	<0.5	<0.5	0	<0.5	<0.01	0	-	-	-	-	-	-	-	-	-	-	-	-
Total Other Chlorinated Hydrocarbons	mg/kg	0.01	<0.5	<0.5	0	<0.5	<0.01	0	-	-	-	-	-	-	-	-	-	-	-	-
PAHs																				
Acenaphthene	mg/kg	0.5	<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	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	-	-	-	-	-	-	-	-	-	-	-	-
Benz(a)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b+j)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b+j+k)fluoranthene	mg/kg	0.5	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	mg/kg	0.5	<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	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	0.5	<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	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene TEQ (Zero)	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	-	-	-	-	-	-	-	-	-	-	-	-
Sum of Polycyclic aromatic hydrocarbons (PAH)	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	-	-	-	-	-	-	-	-	-	-	-	-
Phenols																				
2-Methylphenol	mg/kg	0.2	<0.2	<0.2	0	<0.2	<1	0	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	mg/kg	1	<1	<1	0	<1	<1	0	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<1	0	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	mg/kg	5	<5	<5	0	<5	<5	0	-	-	-	-	-	-	-	-	-	-	-	-
3-&4-Methylphenol (m&p-cresol)	mg/kg	0.4	<0.4	<0.4	0	<0.4	<1	0	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.03	<1	<1	0	<1	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	mg/kg	5	<5	<5	0	<5	<5	0	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	mg/kg	5	<5	<5	0	<5	<5	0	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-o-cyclohexyl phenol	mg/kg	5	<20	<20	0	<20	<5	0	-	-	-	-	-	-	-	-	-	-	-	-
Phenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<1	0	-	-	-	-	-	-	-	-	-	-	-	-
Phenols (non-halogenated)	mg/kg	1	<20	<20	0	<20	<1	0	-	-	-	-	-	-	-	-	-	-	-	-
Halogenated Phenols																				
2,4,5-Trichlorophenol	mg/kg	0.05	<1	<1	0	<1	<0.05	0	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.05	<1	<1	0	<1	<0.05	0	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.03	<0.5	<0.5	0	<0.5	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dichlorophenol	mg/kg	0.03	<0.5	<0.5	0	<0.5	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	mg/kg	0.03	<0.5	<0.5	0	<0.5	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	mg/kg	0.2	<1	<1	0	<1	<0.2	0	-	-	-	-	-	-	-	-	-	-	-	-
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	<1	0	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenols (Halogenated)	mg/kg	0.03	-	-	-	-	<0.03	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenols (Total Halogenated)	mg/kg	1	<1	<1	0	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organochlorine Pesticides																				
a-BHC	mg/kg	0.03	<0.05	<0.05	0	<0.05	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
b-BHC	mg/kg	0.03	<0.05	<0.05	0	<0.05	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
d-BHC	mg/kg	0.03	<0.05	<0.05	0	<0.05	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
g-BHC (Lindane)	mg/kg	0.03	<0.05	<0.05	0	<0.05	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
Aldrin	mg/kg	0.03	<0.05	<0.05	0	<0.05	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
Dieldrin	mg/kg	0.03	<0.05	<0.05	0	<0.05	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
Aldrin + Dieldrin	mg/kg	0.03	<0.05	<0.05	0	<0.05	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
Chlordane	mg/kg	0.03	<0.1	<0.1	0	<0.1	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
DDT	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	-	-	-	-	-	-	-	-	-	-	-	-
4,4-DDE	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	-	-	-	-	-	-	-	-	-	-	-	-
DDD	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	-	-	-	-	-	-	-	-	-	-	-	-
DDT+DDE+DDD	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	-	-	-	-	-	-	-	-	-	-	-	-

senversa

		Location Code	SB05	SB05		SB05	SB05		SB05	SB05		SB05	SB05		SB07	SB07		SB07	SB07	
		Field ID	SB05_0.1-0.2	QA5		SB05_0.1-0.2	QA6		SB05_0.3-0.4	QA3		SB05_0.3-0.4	QA4		SB07_0.0-0.1	QA1		SB07_0.0-0.1	QA2	
		Date	19/07/2018	19/07/2018		19/07/2018	19/07/2018		19/07/2018	19/07/2018		19/07/2018	19/07/2018		19/07/2018	19/07/2018		19/07/2018	19/07/2018	
		Sample Type	Normal	Field_D		Normal	Interlab_D		Normal	Field_D		Normal	Interlab_D		Normal	Field_D		Normal	Interlab_D	
		Lab Report No.	608706	608706	RPD	608706	EM1811718	RPD	608706	608706	RPD	608706	EM1811718	RPD	608706	608706	RPD	608706	EM1811718	RPD
	Unit	EQL																		
Endosulfan I	mg/kg	0.03	<0.05	<0.05	0	<0.05	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan II	mg/kg	0.03	<0.05	<0.05	0	<0.05	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	mg/kg	0.03	<0.05	<0.05	0	<0.05	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
Endrin	mg/kg	0.03	<0.05	<0.05	0	<0.05	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
Chlordane (cis)	mg/kg	0.03	-	-	-	-	<0.03	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlordane (trans)	mg/kg	0.03	-	-	-	-	<0.03	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin aldehyde	mg/kg	0.03	<0.05	<0.05	0	<0.05	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
Endrin ketone	mg/kg	0.05	<0.05	<0.05	0	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	mg/kg	0.03	<0.05	<0.05	0	<0.05	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	mg/kg	0.03	<0.05	<0.05	0	<0.05	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
Methoxychlor	mg/kg	0.03	<0.05	<0.05	0	<0.05	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
Toxaphene	mg/kg	1	<1	<1	0	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organochlorine Pesticides (EPAVic)	mg/kg	0.03	<0.1	<0.1	0	<0.1	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
Other Organochlorine Pesticides (EPAVic)	mg/kg	0.03	<0.1	<0.1	0	<0.1	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
Herbicides																				
Dinoseb	mg/kg	5	<20	<20	0	<20	<5	0	-	-	-	-	-	-	-	-	-	-	-	-
Fungicides																				
Hexachlorobenzene	mg/kg	0.03	<0.05	<0.05	0	<0.05	<0.03	0	-	-	-	-	-	-	-	-	-	-	-	-
Polychlorinated Biphenyls																				
Aroclor 1016	mg/kg	0.1	<0.1	<0.1	0	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor 1221	mg/kg	0.1	<0.1	<0.1	0	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor 1232	mg/kg	0.1	<0.1	<0.1	0	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor 1242	mg/kg	0.1	<0.1	<0.1	0	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor 1248	mg/kg	0.1	<0.1	<0.1	0	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor 1254	mg/kg	0.1	<0.1	<0.1	0	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor 1260	mg/kg	0.1	<0.1	<0.1	0	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	-	-	-	-	-	-	-	-	-	-	-	-
Solvents																				
Methyl Ethyl Ketone (MEK)	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Allyl chloride	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(n:2) Fluorotelomer Sulfonic Acids																				
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.0005	-	-	-	-	-	-	<0.01	<0.01	0	<0.01	<0.0005	0	<0.01	<0.01	0	<0.01	<0.0005	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
Perfluoroalkane Carboxylic Acids																				
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.001	0	<0.005	<0.005	0	<0.005	<0.001	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluoroalkane Sulfonic Acids																				
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorooctanesulfonic acid (PFOS)	mg/kg	0.0002	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	0.0005	0	<0.005	<0.005	0	<0.005	0.0003	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.0002	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Sum of PFHxS and PFOS	mg/kg	0.0002	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	0.0005	0	<0.005	<0.005	0	<0.005	0.0003	0
Perfluoroalkyl Sulfonamides																				
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
N-ethyl-perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	mg/kg	0.0002	-	-	-	-	-	-	<0.01	<0.01	0	<0.01	<0.0002	0	<0.01	<0.01	0	<0.01	<0.0002	0
N-methylperfluorooctane sulfonamidoacetic acid (NMeFOSAA)	mg/kg	0.0002	-	-	-	-	-	-	<0.01	<0.01	0	<0.01	<0.0002	0	<0.01	<0.01	0	<0.01	<0.0002	0
PFAS																				
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	mg/kg	0.005	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	-	-	<0.005	<0.005	0	<0.005	-	-
Sum of US EPA PFAS (PFOS + PFOA)*	mg/kg	0.005	-	-	-	-	-	-	<0.005	<0.005	0	<0.005	-	-	<0.005	<0.005	0	<0.005	-	-
Sum of PFAS	mg/kg	0.0002	-	-	-	-	-	-	<0.05	<0.05	0	<0.05	0.0005	0	<0.05	<0.05	0	<0.05	0.0003	0
Sum of PFAS (WA DER List)	mg/kg	0.0002	-	-	-	-	-	-	<0.01	<0.01	0	<0.01	0.0005	0	<0.01	<0.01	0	<0.01	0.0003	0

*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 B: Lithology Logs

BOREHOLE NUMBER SB01

senversa

PROJECT NAME Preliminary Soil Contamination Assessment

PROJECT NUMBER M16733 **PROJECT LOCATION** Melbourne Airport

DATE STARTED 19/7/18 **COMPLETED** 19/7/18 **R.L. SURFACE** **DATUM**

DRILLING CONTRACTOR Horizon Drilling **RL Casing**

EQUIPMENT Geoprobe **HOLE LOCATION (Easting, Northing)**

HOLE SIZE 125 mm **LOGGED BY** SO **CHECKED BY** SK

NOTES

DRILLING						FIELD MATERIAL DESCRIPTION				SAMPLING	
Method	Core Recovery (%)	Water	Well Details	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture	Additional Observations	PID (ppm)	Sample ID & Interval (QA/QC)
HA						FILL	FILL: Grey, fine to medium grained gravel, minor silt and clay. Gap graded, sub-angular gravel.	D		0.0	SB01_0.0 - 0.1
										0.0	SB01_0.4 - 0.5
				0.5							
						CL-ML	Silty CLAY: Medium plasticity. Grey to brown, firm silty clay.				
				1.0							
						SC	Clayey SAND: white to pale grey, fine grained calcareous sand. Uniform, rounded sand.			0.0	SB01_1.1 - 1.2
						CL-ML	Silty CLAY: Medium plasticity. Grey to brown, firm silty clay.				
							SB01 terminated at 1.30 m bgl End of borehole on natural material				
				1.5							

These logs have been prepared for environmental purposes and should not be used for geotechnical design and interpretive purposes

BOREHOLE NUMBER SB02

senversa

PROJECT NAME Preliminary Soil Contamination Assessment

PROJECT NUMBER M16733 **PROJECT LOCATION** Melbourne Airport

DATE STARTED 19/7/18 **COMPLETED** 19/7/18 **R.L. SURFACE** **DATUM**

DRILLING CONTRACTOR Horizon Drilling **RL Casing**

EQUIPMENT Geoprobe **HOLE LOCATION (Easting, Northing)**

HOLE SIZE 125 mm **LOGGED BY** SO **CHECKED BY** SK

NOTES

DRILLING						FIELD MATERIAL DESCRIPTION				SAMPLING	
Method	Core Recovery (%)	Water	Well Details	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture	Additional Observations	PID (ppm)	Sample ID & Interval (QA/QC)
HA				0.0–0.05		ASPHALT	Asphalt. 50 mm thick.				
				0.05–0.3		FILL	FILL: Grey to brown, fine to medium grained gravel, with minor fine to medium grained sand and trace silt and clay. Gap graded, subangular gravel.	M		0.1	SB02_0.1 - 0.2
				0.3–0.5		FILL	FILL: Brown, fine to medium grained sandy gravel with trace silt and clay. Gap graded, sub-angular gravel.	D-M		-	SB02_0.3 - 0.4
HA / PT	100 (PT)			0.5–1.9		CH	Silty CLAY: High plasticity. Brown to red-brown, firm silty clay. (Becoming grey-brown with increasing depth).	M		0.1	SB02_0.6 - 0.7
										-	SB02_1.3 - 1.4
										0.1	SB02_1.8 - 1.9
				1.9–2.0			SB02 terminated at 1.90 m bgl Refusal on basalt.				

These logs have been prepared for environmental purposes and should not be used for geotechnical design and interpretive purposes

BOREHOLE NUMBER SB03

senversa

PROJECT NAME Preliminary Soil Contamination Assessment

PROJECT NUMBER M16733 **PROJECT LOCATION** Melbourne Airport

DATE STARTED 19/7/18 **COMPLETED** 19/7/18 **R.L. SURFACE** **DATUM**

DRILLING CONTRACTOR Horizon Drilling **RL Casing**

EQUIPMENT Geoprobe **HOLE LOCATION (Easting, Northing)**

HOLE SIZE 125 mm **LOGGED BY** SO **CHECKED BY** SK

NOTES

Method	Core Recovery (%)	Water	Well Details	Depth (m)	Classification Symbol	Material Description	Moisture	Additional Observations
HA					ASPHALT	Asphalt. 50 mm thick.	M	
HA					FILL	FILL: Brown, gravelly sand, fine to medium grained gravel. Gap graded, sub-angular gravel.	M	
HA					FILL	FILL: Brown, sandy clay, fine to medium grained sand, minor fine grained gravels and silt. Gap graded, sub-angular gravels, well graded, sub-rounded sand.	M	
HA				0.5–1.0	CH	Silty CLAY: High plasticity. Brown, firm silty clay.	M	
HA					SC	Clayey SAND: Low plasticity. Pale grey to brown, soft, fine grained calcareous sand. Uniform graded, rounded sand.	M	
PT	100				CH	Silty CLAY: High plasticity. Brown, firm silty clay.	M	
PT	100				SC	Clayey SAND: Low plasticity. Pale grey to brown, soft, fine grained calcareous sand. Uniform graded, rounded sand.	M	
PT	100			1.5–2.0	CH	Silty CLAY: High plasticity. Brown, firm silty clay.	M	
PT	100				SC	Clayey SAND: Low plasticity. Orange-brown. Minor fine grained gravels. Gap graded, sub-rounded gravel, uniform graded, rounded sand.	M	
				2.5–3.0		SB03 terminated at 2.45 m bgl Refusal on basalt.		

SAMPLING

PID (ppm)	Sample ID & Interval (QA/QC)
0.0	SB03_0.1 - 0.2
0.0	SB03_0.2 - 0.3
-	SB03_1.1 - 1.2
-	SB03_1.6 - 1.7

1. SENVERSA STANDARD V1 M16733.GPJ SENVERSA_GINT.GDT 8/8/18

These logs have been prepared for environmental purposes and should not be used for geotechnical design and interpretive purposes

BOREHOLE NUMBER SB04

senversa

PROJECT NAME Preliminary Soil Contamination Assessment

PROJECT NUMBER M16733 **PROJECT LOCATION** Melbourne Airport

DATE STARTED 19/7/18 **COMPLETED** 19/7/18 **R.L. SURFACE** **DATUM**

DRILLING CONTRACTOR Horizon Drilling **RL Casing**

EQUIPMENT Geoprobe **HOLE LOCATION (Easting, Northing)**

HOLE SIZE 125 mm **LOGGED BY** SO **CHECKED BY** SK

NOTES

DRILLING						FIELD MATERIAL DESCRIPTION				SAMPLING	
Method	Core Recovery (%)	Water	Well Details	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture	Additional Observations	PID (ppm)	Sample ID & Interval (QA/QC)
HA						ASPHALT	Asphalt. 60 mm thick.	D			
						FILL	FILL: Grey-brown, fine to medium grained silty gravel with trace clay and fine grained sand. Gap graded, sub-angular gravel.			0.2	SB04_0.1 - 0.2
				0.5		CH	Silty CLAY: Medium plasticity. Brown, firm silty clay.			0.2	SB04_0.5 - 0.6
				1.0		SC	Clayey SAND: Low plasticity. Pale grey to brown, soft, fine grained calcareous sand. Uniform graded, rounded sand.	D		0.2	SB04_1.0 - 1.1
							Orange-brown. Minor fine to medium grained gravels.				
PT	100			1.5		CLS	Sandy CLAY: Low plasticity. Orange-brown, fine grained sand with minor fine to medium grained gravels. Uniform graded, rounded sand, gap graded, sub-rounded gravel.				
				2.0						0.2	SB04_2.2 - 2.3
				2.5			SB04 terminated at 2.30 m bgl Refusal on basalt.				

BOREHOLE NUMBER SB05

senversa

PROJECT NAME Preliminary Soil Contamination Assessment

PROJECT NUMBER M16733 **PROJECT LOCATION** Melbourne Airport

DATE STARTED 19/7/18 **COMPLETED** 19/7/18 **R.L. SURFACE** **DATUM**

DRILLING CONTRACTOR Horizon Drilling **RL Casing**

EQUIPMENT Geoprobe **HOLE LOCATION (Easting, Northing)**

HOLE SIZE 125 mm **LOGGED BY** SO **CHECKED BY** SK

NOTES

Method	Core Recovery (%)	Water	Well Details	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture	Additional Observations	PID (ppm)	Sample ID & Interval (QA/QC)
HA				0.0–0.03		ASPHALT	Asphalt. 30 mm thick.				
HA						FILL	FILL: Grey-brown, fine to medium grained silty gravel with trace clay and fine grained sand. Gap graded, sub-angular gravel.	D-M		0.3	SB05_0.1 - 0.2
HA						FILL	FILL: Grey-brown, silty clay, low plasticity with trace fine to medium grained gravels. Gap graded, sub-angular gravel.	D-M		0.2	SB05_0.3 - 0.4
HA				0.5		CL-ML	Silty CLAY: Low plasticity. Brown, firm to stiff silty clay.	D-M		0.1	SB05_0.5 - 0.6
HA / PT	100			1.0			Low to medium plasticity. Trace gravels and sands increasing with depth.	D-M		0.2	SB05_1.0 - 1.1
PT	100			2.5				D-M		0.1	SB05_2.5 - 2.6
PT	100							D-M		-	SB05_2.6 - 2.7
PT	100			2.7–3.0		CLS	Sandy CLAY: Low plasticity. Orange-brown, fine grained sand, minor fine to medium grained gravels. Uniform graded, rounded sand.	D			
				3.0			SB05 terminated at 3.00 m bgl Refusal on basalt.				

1. SENVERSA STANDARD V1 M16733.GPJ SENVERSA_GINT.GDT 8/8/18

These logs have been prepared for environmental purposes and should not be used for geotechnical design and interpretive purposes

BOREHOLE NUMBER SB06

senversa

PROJECT NAME Preliminary Soil Contamination Assessment

PROJECT NUMBER M16733 **PROJECT LOCATION** Melbourne Airport

DATE STARTED 19/7/18 **COMPLETED** 19/7/18 **R.L. SURFACE** **DATUM**

DRILLING CONTRACTOR Horizon Drilling **RL Casing**

EQUIPMENT Geoprobe **HOLE LOCATION (Easting, Northing)**

HOLE SIZE 125 mm **LOGGED BY** SO **CHECKED BY** SK

NOTES

DRILLING						FIELD MATERIAL DESCRIPTION				SAMPLING	
Method	Core Recovery (%)	Water	Well Details	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture	Additional Observations	PID (ppm)	Sample ID & Interval (QA/QC)
HA						ASPHALT	Asphalt. 50 mm thick.				
						FILL	FILL: Grey, fine to medium grained silty gravel. Gap graded, sub angular gravel.			0.3	SB06_0.1 - 0.2
						CL-ML	Silty CLAY: Low to medium plasticity. Brown, firm to stiff silty clay.			-	SB06_0.3 - 0.4
				0.5						0.2	SB06_0.4 - 0.5
						SC	Clayey SAND: Low plasticity. Pale grey, soft, fine grained calcareous sand with trace fine to medium grained gravels. Uniform, rounded sand. (Becoming orange-brown with increasing depth. Gravel content increasing with depth).			-	SB06_0.7 - 0.8
				1.0							
PT	100					CLS	Sandy CLAY: Low plasticity. Orange-brown, fine grained sand, minor fine to medium grained gravels. Uniform graded, rounded sand, gap graded, sub-rounded gravel. Gravel content increasing with depth.	D		0.1	SB06_1.2 - 1.3
				1.5							
				2.0						-	SB06_2.0 - 2.1
										0.1	SB06_2.3 - 2.4
				2.5			SB06 terminated at 2.40 m bgl End of borehole on natural material				
				3.0							

These logs have been prepared for environmental purposes and should not be used for geotechnical design and interpretive purposes

BOREHOLE NUMBER SB07

senversa

PROJECT NAME Preliminary Soil Contamination Assessment

PROJECT NUMBER M16733 **PROJECT LOCATION** Melbourne Airport

DATE STARTED 19/7/18 **COMPLETED** 19/7/18 **R.L. SURFACE** **DATUM**

DRILLING CONTRACTOR Horizon Drilling **RL Casing**

EQUIPMENT Geoprobe **HOLE LOCATION (Easting, Northing)**

HOLE SIZE 125 mm **LOGGED BY** SO **CHECKED BY** SK

NOTES

DRILLING						FIELD MATERIAL DESCRIPTION				SAMPLING	
Method	Core Recovery (%)	Water	Well Details	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture	Additional Observations	PID (ppm)	Sample ID & Interval (QA/QC)
HA				0.0		FILL	FILL: Brown, fine to medium grained gravel with minor silt and clay. Gap graded, sub-angular gravel. (Silt and clay increasing with depth).	D		-	SB07_0.0 - 0.1
										0.1	SB07_0.1 - 0.2
				0.5		FILL	FILL: Brown, silt with minor clay. (Clay content increasing with depth).			0.1	SB07_0.5 - 0.6
						CL-ML	Silty CLAY: Medium plasticity. Brown, firm to stiff sily clay with trace organics.			-	SB07_0.6 - 0.7
				1.0		SC	Clayey SAND: Low plasticity. Pale grey, soft, fine grained calcareous sand. Uniform graded, rounded sand. (Becoming orange-brown with increasing depth).			0.1	SB07_1.1 - 1.2
				1.5			SB07 terminated at 1.20 m bgl End of borehole on natural material				

These logs have been prepared for environmental purposes and should not be used for geotechnical design and interpretive purposes

BOREHOLE NUMBER SS01

senversa

PROJECT NAME Preliminary Soil Contamination Assessment

PROJECT NUMBER M16733 **PROJECT LOCATION** Melbourne Airport

DATE STARTED 19/7/18 **COMPLETED** 19/7/18 **R.L. SURFACE** **DATUM**

DRILLING CONTRACTOR - **RL Casing**

EQUIPMENT Trowel **HOLE LOCATION (Easting, Northing)**

HOLE SIZE 125 mm **LOGGED BY** SO **CHECKED BY** SK

NOTES

DRILLING						FIELD MATERIAL DESCRIPTION					SAMPLING	
Method	Core Recovery (%)	Water	Well Details	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture	Additional Observations	PID (ppm)		Sample ID & Interval (QA/QC)
HE						FILL	FILL: Grey-brown, fine to medium grained sand with minor organics, fine to medium grained gravel and trace silt. Gap graded, sub-rounded sand, gap graded, sub-angular gravel.	M		-		SS01_0.0 - 0.1
				0.5 1.0			SS01 terminated at 0.10 m bgl End of excavation in fill.					

BOREHOLE NUMBER SS02

senversa

PROJECT NAME Preliminary Soil Contamination Assessment

PROJECT NUMBER M16733 **PROJECT LOCATION** Melbourne Airport

DATE STARTED 19/7/18 **COMPLETED** 19/7/18 **R.L. SURFACE** **DATUM**

DRILLING CONTRACTOR - **RL Casing**

EQUIPMENT Trowel **HOLE LOCATION (Easting, Northing)**

HOLE SIZE 125 mm **LOGGED BY** SO **CHECKED BY** SK

NOTES

DRILLING						FIELD MATERIAL DESCRIPTION				SAMPLING	
Method	Core Recovery (%)	Water	Well Details	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture	Additional Observations	PID (ppm)	Sample ID & Interval (QA/QC)
HE						FILL	FILL: Brown, silty clay, low plasticity with minor organics and trace fine grained gravels. Gap graded, sub-angular gravels.	M		-	SS02_0.0 - 0.1
				0.5			SS02 terminated at 0.10 m bgl End of excavation in fill.				
				1.0							

These logs have been prepared for environmental purposes and should not be used for geotechnical design and interpretive purposes

BOREHOLE NUMBER SS03

senversa

PROJECT NAME Preliminary Soil Contamination Assessment

PROJECT NUMBER M16733 **PROJECT LOCATION** Melbourne Airport

DATE STARTED 19/7/18 **COMPLETED** 19/7/18 **R.L. SURFACE** **DATUM**

DRILLING CONTRACTOR - **RL Casing**

EQUIPMENT Trowel **HOLE LOCATION (Easting, Northing)**

HOLE SIZE 125 mm **LOGGED BY** SO **CHECKED BY** SK

NOTES

DRILLING						FIELD MATERIAL DESCRIPTION				SAMPLING	
Method	Core Recovery (%)	Water	Well Details	Depth (m)	Graphic Log	Classification Symbol	Material Description	Moisture	Additional Observations	PID (ppm)	Sample ID & Interval (QA/QC)
HE						FILL	FILL: Grey-brown, fine to medium grained sand and silt with trace fine grained gravel and organics. Gap graded, sub-rounded sand, gap graded, sub-angular gravel.	D		-	SS03_0.0 - 0.1
				0.5			SS03 terminated at 0.10 m bgl End of excavation in fill.				
				1.0							

Appendix C: Photographs

Photo 1. Lithology encountered ranging shallow gravelly fill (left) to silty clay with calcareous inclusions (right).

Photo 2. Lithology encountered ranging from gravelly fill to silty clay, becoming sandy with weathered basalt gravels with increasing depth.

Photo 3. Orange-brown sandy clay material encountered beneath silty clay at some locations.

Photo 4. Weathered basalt gravels.

Photo 5. Orange-brown clayey sand with basalt gravels encountered within some locations.

Appendix D: Laboratory Certificates

eurofins | mgt

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

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

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

Sample Receipt Advice

Company name:	**Senversa Pty Ltd VIC**
Contact name:	Samuel O'Connor
Project name:	ARUP CONTAMINATION ASSESSMENT
Project ID:	M16733
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Jul 20, 2018 12:35 PM
Eurofins | mgt reference:	**608706**

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 | mgt Sample Receipt : 1.6 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:

Natalie Krasselt on Phone : +61 3 8564 5000 or by e.mail: NatalieKrasselt@eurofins.com

Results will be delivered electronically via e.mail to Samuel O'Connor - samuel.o'connor@senversa.com.au.

eurofins | mgt

30 years Testing For Life 1987–2017
Celebrating 30 years Testing and Protecting Human Health

Certificate of Analysis

Senversa Pty Ltd VIC
Level 6, 15 Williams 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: **Samuel O'Connor**

Report **608706-S**
Project name ARUP CONTAMINATION ASSESSMENT
Project ID M16733
Received Date Jul 20, 2018

Client Sample ID			**SB01_0.0-0.1**	**SB01_0.4-0.5**	**SB01_1.1-1.2**	**SB07_0.0-0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jl24279**	**M18-Jl24280**	**M18-Jl24281**	**M18-Jl24282**
Date Sampled			**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	-
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	-
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	-
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	-
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	-
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	< 0.5	-	-
1.2.4-Trichlorobenzene	0.5	mg/kg	-	< 0.5	-	-
Hexachlorobutadiene	0.5	mg/kg	-	< 0.5	-	-
1.1-Dichloroethene	0.5	mg/kg	-	< 0.5	-	-
1.1.1-Trichloroethane	0.5	mg/kg	-	< 0.5	-	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	< 0.5	-	-
1.1.2-Trichloroethane	0.5	mg/kg	-	< 0.5	-	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	< 0.5	-	-
1.2-Dibromoethane	0.5	mg/kg	-	< 0.5	-	-
1.2-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	-
1.2-Dichloroethane	0.5	mg/kg	-	< 0.5	-	-
1.2-Dichloropropane	0.5	mg/kg	-	< 0.5	-	-
1.2.3-Trichloropropane	0.5	mg/kg	-	< 0.5	-	-
1.2.4-Trimethylbenzene	0.5	mg/kg	-	< 0.5	-	-
1.3-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	-
1.3-Dichloropropane	0.5	mg/kg	-	< 0.5	-	-
1.3.5-Trimethylbenzene	0.5	mg/kg	-	< 0.5	-	-
1.4-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	-
2-Butanone (MEK)	0.5	mg/kg	-	< 0.5	-	-
2-Propanone (Acetone)	0.5	mg/kg	-	< 0.5	-	-
4-Chlorotoluene	0.5	mg/kg	-	< 0.5	-	-
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	-	< 0.5	-	-
Allyl chloride	0.5	mg/kg	-	< 0.5	-	-
Benzene	0.1	mg/kg	-	< 0.1	-	-
Bromobenzene	0.5	mg/kg	-	< 0.5	-	-
Bromochloromethane	0.5	mg/kg	-	< 0.5	-	-
Bromodichloromethane	0.5	mg/kg	-	< 0.5	-	-
Bromoform	0.5	mg/kg	-	< 0.5	-	-
Bromomethane	0.5	mg/kg	-	< 0.5	-	-

Client Sample ID			SB01_0.0-0.1	SB01_0.4-0.5	SB01_1.1-1.2	SB07_0.0-0.1
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jl24279**	**M18-Jl24280**	**M18-Jl24281**	**M18-Jl24282**
Date Sampled			**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**
Test/Reference	LOR	Unit				
Volatile Organics						
Carbon disulfide	0.5	mg/kg	-	< 0.5	-	-
Carbon Tetrachloride	0.5	mg/kg	-	< 0.5	-	-
Chlorobenzene	0.5	mg/kg	-	< 0.5	-	-
Chloroethane	0.5	mg/kg	-	< 0.5	-	-
Chloroform	0.5	mg/kg	-	< 0.5	-	-
Chloromethane	0.5	mg/kg	-	< 0.5	-	-
cis-1.2-Dichloroethene	0.5	mg/kg	-	< 0.5	-	-
cis-1.3-Dichloropropene	0.5	mg/kg	-	< 0.5	-	-
Dibromochloromethane	0.5	mg/kg	-	< 0.5	-	-
Dibromomethane	0.5	mg/kg	-	< 0.5	-	-
Dichlorodifluoromethane	0.5	mg/kg	-	< 0.5	-	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	-
Iodomethane	0.5	mg/kg	-	< 0.5	-	-
Isopropyl benzene (Cumene)	0.5	mg/kg	-	< 0.5	-	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	-
Methylene Chloride	0.5	mg/kg	-	< 0.5	-	-
o-Xylene	0.1	mg/kg	-	< 0.1	-	-
Styrene	0.5	mg/kg	-	< 0.5	-	-
Tetrachloroethene	0.5	mg/kg	-	< 0.5	-	-
Toluene	0.1	mg/kg	-	< 0.1	-	-
trans-1.2-Dichloroethene	0.5	mg/kg	-	< 0.5	-	-
trans-1.3-Dichloropropene	0.5	mg/kg	-	< 0.5	-	-
Trichloroethene	0.5	mg/kg	-	< 0.5	-	-
Trichlorofluoromethane	0.5	mg/kg	-	< 0.5	-	-
Vinyl chloride	0.5	mg/kg	-	< 0.5	-	-
Xylenes - Total	0.3	mg/kg	-	< 0.3	-	-
Total MAH*	0.5	mg/kg	-	< 0.5	-	-
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	-	< 0.5	-	-
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	-	< 0.5	-	-
4-Bromofluorobenzene (surr.)	1	%	-	102	-	-
Toluene-d8 (surr.)	1	%	-	98	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	-
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	-
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	-
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-

Client Sample ID			SB01_0.0-0.1	SB01_0.4-0.5	SB01_1.1-1.2	SB07_0.0-0.1
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-JI24279**	**M18-JI24280**	**M18-JI24281**	**M18-JI24282**
Date Sampled			**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	97	91	64	-
p-Terphenyl-d14 (surr.)	1	%	112	90	83	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	-
a-BHC	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-
b-BHC	0.05	mg/kg	-	< 0.05	-	-
d-BHC	0.05	mg/kg	-	< 0.05	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	-
Endrin ketone	0.05	mg/kg	-	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.05	mg/kg	-	< 0.05	-	-
Toxaphene	1	mg/kg	-	< 1	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	-	96	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	92	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1232	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1242	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1248	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1254	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1260	0.1	mg/kg	-	< 0.1	-	-

eurofins | mgt

Client Sample ID			SB01_0.0-0.1	SB01_0.4-0.5	SB01_1.1-1.2	SB07_0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24279	M18-Jl24280	M18-Jl24281	M18-Jl24282
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Total PCB*	0.1	mg/kg	-	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	-	96	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	92	-	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	< 0.5	-	-
2.4-Dichlorophenol	0.5	mg/kg	-	< 0.5	-	-
2.4.5-Trichlorophenol	1	mg/kg	-	< 1	-	-
2.4.6-Trichlorophenol	1.0	mg/kg	-	< 1	-	-
2.6-Dichlorophenol	0.5	mg/kg	-	< 0.5	-	-
4-Chloro-3-methylphenol	1.0	mg/kg	-	< 1	-	-
Pentachlorophenol	1.0	mg/kg	-	< 1	-	-
Tetrachlorophenols - Total	1.0	mg/kg	-	< 1	-	-
Total Halogenated Phenol*	1	mg/kg	-	< 1	-	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	< 20	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	< 5	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	< 0.2	-	-
2-Nitrophenol	1.0	mg/kg	-	< 1	-	-
2.4-Dimethylphenol	0.5	mg/kg	-	< 0.5	-	-
2.4-Dinitrophenol	5	mg/kg	-	< 5	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	< 0.4	-	-
4-Nitrophenol	5	mg/kg	-	< 5	-	-
Dinoseb	20	mg/kg	-	< 20	-	-
Phenol	0.5	mg/kg	-	< 0.5	-	-
Total Non-Halogenated Phenol*	20	mg/kg	-	< 20	-	-
Phenol-d6 (surr.)	1	%	-	89	-	-
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	-	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	-	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	-	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	-	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	-	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	-	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	-	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	-	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	-	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	-	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	-	< 5
13C4-PFBA (surr.)	1	%	102	105	-	121
13C5-PFPeA (surr.)	1	%	109	116	-	108
13C5-PFHxA (surr.)	1	%	134	147	-	132
13C4-PFHpA (surr.)	1	%	84	109	-	100
13C8-PFOA (surr.)	1	%	102	110	-	97
13C5-PFNA (surr.)	1	%	122	129	-	113
13C6-PFDA (surr.)	1	%	111	121	-	108
13C2-PFUnDA (surr.)	1	%	120	129	-	114
13C2-PFDoDA (surr.)	1	%	107	119	-	117
13C2-PFTeDA (surr.)	1	%	107	127	-	108

Client Sample ID			SB01_0.0-0.1	SB01_0.4-0.5	SB01_1.1-1.2	SB07_0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24279	M18-Jl24280	M18-Jl24281	M18-Jl24282
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)N11	5	ug/kg	< 5	< 5	-	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)N11	5	ug/kg	< 5	< 5	-	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)N11	5	ug/kg	< 5	< 5	-	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)N11	5	ug/kg	< 5	< 5	-	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)N11	5	ug/kg	< 5	< 5	-	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)N11	10	ug/kg	< 10	< 10	-	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)N11	10	ug/kg	< 10	< 10	-	< 10
13C8-FOSA (surr.)	1	%	82	98	-	77
D3-N-MeFOSA (surr.)	1	%	86	95	-	79
D5-N-EtFOSA (surr.)	1	%	INT	INT	-	110
D7-N-MeFOSE (surr.)	1	%	106	118	-	117
D9-N-EtFOSE (surr.)	1	%	98	120	-	103
D5-N-EtFOSAA (surr.)	1	%	118	118	-	95
D3-N-MeFOSAA (surr.)	1	%	107	120	-	116
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)N11	5	ug/kg	< 5	< 5	-	< 5
Perfluoropentanesulfonic acid (PFPeS)N15	5	ug/kg	< 5	< 5	-	< 5
Perfluorohexanesulfonic acid (PFHxS)N11	5	ug/kg	< 5	< 5	-	< 5
Perfluoroheptanesulfonic acid (PFHpS)N15	5	ug/kg	< 5	< 5	-	< 5
Perfluorooctanesulfonic acid (PFOS)N11	5	ug/kg	< 5	< 5	-	< 5
Perfluorodecanesulfonic acid (PFDS)N15	5	ug/kg	< 5	< 5	-	< 5
13C3-PFBS (surr.)	1	%	126	136	-	122
18O2-PFHxS (surr.)	1	%	116	125	-	113
13C8-PFOS (surr.)	1	%	125	137	-	124
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)N11	5	ug/kg	< 5	< 5	-	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)N11	10	ug/kg	< 10	< 10	-	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)N11	5	ug/kg	< 5	< 5	-	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)N15	5	ug/kg	< 5	< 5	-	< 5
13C2-4:2 FTSA (surr.)	1	%	120	132	-	103
13C2-6:2 FTSA (surr.)	1	%	125	125	-	106
13C2-8:2 FTSA (surr.)	1	%	137	156	-	138
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	-	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	-	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	-	< 5
Sum of WA DER PFAS (n=10)*	10	ug/kg	< 10	< 10	-	< 10
Sum of PFASs (n=28)*	50	ug/kg	< 50	< 50	-	< 50
Chromium (hexavalent)	1	mg/kg	-	< 1	-	-
Cyanide (total)	5	mg/kg	-	< 5	-	-
Fluoride	100	mg/kg	-	180	-	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	8.5	-	-
% Moisture	1	%	3.9	4.9	20	11

Client Sample ID			SB01_0.0-0.1	SB01_0.4-0.5	SB01_1.1-1.2	SB07_0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24279	M18-Jl24280	M18-Jl24281	M18-Jl24282
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	< 2	83	< 2	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	-
Chromium	5	mg/kg	24	50	53	-
Copper	5	mg/kg	35	24	5.9	-
Lead	5	mg/kg	250	11	12	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Molybdenum	5	mg/kg	< 5	< 5	< 5	-
Nickel	5	mg/kg	87	50	41	-
Selenium	2	mg/kg	< 2	< 2	< 2	-
Silver	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Tin	10	mg/kg	< 10	< 10	< 10	-
Zinc	5	mg/kg	55	56	14	-

Client Sample ID			SB07_0.1-0.2	SB07_1.1-1.2	SB06_0.1-0.2	SB06_0.3-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24283	M18-Jl24284	M18-Jl24285	M18-Jl24286
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	< 20	-
TRH C10-C14	20	mg/kg	< 20	-	< 20	-
TRH C15-C28	50	mg/kg	< 50	-	< 50	-
TRH C29-C36	50	mg/kg	< 50	-	110	-
TRH C10-36 (Total)	50	mg/kg	< 50	-	110	-
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.2.4-Trichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
Hexachlorobutadiene	0.5	mg/kg	< 0.5	-	-	-
1.1-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
1.1.1-Trichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.2-Trichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dibromoethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.2.3-Trichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.2.4-Trimethylbenzene	0.5	mg/kg	< 0.5	-	-	-
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
1.3-Dichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.3.5-Trimethylbenzene	0.5	mg/kg	< 0.5	-	-	-
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
2-Butanone (MEK)	0.5	mg/kg	< 0.5	-	-	-
2-Propanone (Acetone)	0.5	mg/kg	< 0.5	-	-	-
4-Chlorotoluene	0.5	mg/kg	< 0.5	-	-	-
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	< 0.5	-	-	-
Allyl chloride	0.5	mg/kg	< 0.5	-	-	-

Client Sample ID			SB07_0.1-0.2	SB07_1.1-1.2	SB06_0.1-0.2	SB06_0.3-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24283	M18-Jl24284	M18-Jl24285	M18-Jl24286
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Volatile Organics						
Benzene	0.1	mg/kg	< 0.1	-	-	-
Bromobenzene	0.5	mg/kg	< 0.5	-	-	-
Bromochloromethane	0.5	mg/kg	< 0.5	-	-	-
Bromodichloromethane	0.5	mg/kg	< 0.5	-	-	-
Bromoform	0.5	mg/kg	< 0.5	-	-	-
Bromomethane	0.5	mg/kg	< 0.5	-	-	-
Carbon disulfide	0.5	mg/kg	< 0.5	-	-	-
Carbon Tetrachloride	0.5	mg/kg	< 0.5	-	-	-
Chlorobenzene	0.5	mg/kg	< 0.5	-	-	-
Chloroethane	0.5	mg/kg	< 0.5	-	-	-
Chloroform	0.5	mg/kg	< 0.5	-	-	-
Chloromethane	0.5	mg/kg	< 0.5	-	-	-
cis-1.2-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
cis-1.3-Dichloropropene	0.5	mg/kg	< 0.5	-	-	-
Dibromochloromethane	0.5	mg/kg	< 0.5	-	-	-
Dibromomethane	0.5	mg/kg	< 0.5	-	-	-
Dichlorodifluoromethane	0.5	mg/kg	< 0.5	-	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	-	-
Iodomethane	0.5	mg/kg	< 0.5	-	-	-
Isopropyl benzene (Cumene)	0.5	mg/kg	< 0.5	-	-	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	-	-
Methylene Chloride	0.5	mg/kg	< 0.5	-	-	-
o-Xylene	0.1	mg/kg	< 0.1	-	-	-
Styrene	0.5	mg/kg	< 0.5	-	-	-
Tetrachloroethene	0.5	mg/kg	< 0.5	-	-	-
Toluene	0.1	mg/kg	< 0.1	-	-	-
trans-1.2-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
trans-1.3-Dichloropropene	0.5	mg/kg	< 0.5	-	-	-
Trichloroethene	0.5	mg/kg	< 0.5	-	-	-
Trichlorofluoromethane	0.5	mg/kg	< 0.5	-	-	-
Vinyl chloride	0.5	mg/kg	< 0.5	-	-	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	-	-
Total MAH*	0.5	mg/kg	< 0.5	-	-	-
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	< 0.5	-	-	-
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	< 0.5	-	-	-
4-Bromofluorobenzene (surr.)	1	%	103	-	-	-
Toluene-d8 (surr.)	1	%	93	-	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5	-
TRH C6-C10	20	mg/kg	< 20	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20	-
TRH >C10-C16	50	mg/kg	< 50	-	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	< 50	-
TRH >C16-C34	100	mg/kg	< 100	-	< 100	-
TRH >C34-C40	100	mg/kg	< 100	-	100	-

Client Sample ID			SB07_0.1-0.2	SB07_1.1-1.2	SB06_0.1-0.2	SB06_0.3-0.4
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jl24283**	**M18-Jl24284**	**M18-Jl24285**	**M18-Jl24286**
Date Sampled			**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	95	-	89	-
p-Terphenyl-d14 (surr.)	1	%	98	-	100	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.05	mg/kg	< 0.05	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	-	-
Dibutylchlorendate (surr.)	1	%	136	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	137	-	-	-

Client Sample ID			SB07_0.1-0.2	SB07_1.1-1.2	SB06_0.1-0.2	SB06_0.3-0.4
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jl24283**	**M18-Jl24284**	**M18-Jl24285**	**M18-Jl24286**
Date Sampled			**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1232	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1242	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1248	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1254	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1260	0.1	mg/kg	< 0.1	-	-	-
Total PCB*	0.1	mg/kg	< 0.1	-	-	-
Dibutylchlorendate (surr.)	1	%	136	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	137	-	-	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	-	-
2.4.6-Trichlorophenol	1.0	mg/kg	< 1	-	-	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
4-Chloro-3-methylphenol	1.0	mg/kg	< 1	-	-	-
Pentachlorophenol	1.0	mg/kg	< 1	-	-	-
Tetrachlorophenols - Total	1.0	mg/kg	< 1	-	-	-
Total Halogenated Phenol*	1	mg/kg	< 1	-	-	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	-	-
2-Nitrophenol	1.0	mg/kg	< 1	-	-	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dinitrophenol	5	mg/kg	< 5	-	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	-	-
4-Nitrophenol	5	mg/kg	< 5	-	-	-
Dinoseb	20	mg/kg	< 20	-	-	-
Phenol	0.5	mg/kg	< 0.5	-	-	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	-	-
Phenol-d6 (surr.)	1	%	102	-	-	-
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	-	< 5	-	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	-	< 5	-	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	-	< 5	-	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	-	< 5	-	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	-	< 5	-	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	-	< 5	-	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	-	< 5	-	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	-	< 5	-	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	-	< 5	-	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	-	< 5	-	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	-	< 5	-	< 5
13C4-PFBA (surr.)	1	%	-	107	-	115
13C5-PFPeA (surr.)	1	%	-	113	-	109
13C5-PFHxA (surr.)	1	%	-	135	-	130
13C4-PFHpA (surr.)	1	%	-	106	-	101

Client Sample ID			SB07_0.1-0.2	SB07_1.1-1.2	SB06_0.1-0.2	SB06_0.3-0.4
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jl24283**	**M18-Jl24284**	**M18-Jl24285**	**M18-Jl24286**
Date Sampled			**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C8-PFOA (surr.)	1	%	-	99	-	97
13C5-PFNA (surr.)	1	%	-	126	-	122
13C6-PFDA (surr.)	1	%	-	114	-	121
13C2-PFUnDA (surr.)	1	%	-	116	-	124
13C2-PFDoDA (surr.)	1	%	-	116	-	118
13C2-PFTeDA (surr.)	1	%	-	112	-	120
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	-	< 5	-	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	-	< 5	-	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	-	< 5	-	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	5	ug/kg	-	< 5	-	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	5	ug/kg	-	< 5	-	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	-	< 10	-	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	-	< 10	-	< 10
13C8-FOSA (surr.)	1	%	-	101	-	92
D3-N-MeFOSA (surr.)	1	%	-	108	-	81
D5-N-EtFOSA (surr.)	1	%	-	126	-	199
D7-N-MeFOSE (surr.)	1	%	-	122	-	124
D9-N-EtFOSE (surr.)	1	%	-	125	-	123
D5-N-EtFOSAA (surr.)	1	%	-	110	-	123
D3-N-MeFOSAA (surr.)	1	%	-	121	-	129
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	-	< 5	-	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	-	< 5	-	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	-	< 5	-	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	-	< 5	-	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	-	< 5	-	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	-	< 5	-	< 5
13C3-PFBS (surr.)	1	%	-	127	-	123
18O2-PFHxS (surr.)	1	%	-	116	-	115
13C8-PFOS (surr.)	1	%	-	129	-	118
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	-	< 5	-	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	10	ug/kg	-	< 10	-	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	-	< 5	-	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	5	ug/kg	-	< 5	-	< 5
13C2-4:2 FTSA (surr.)	1	%	-	103	-	100
13C2-6:2 FTSA (surr.)	1	%	-	107	-	95
13C2-8:2 FTSA (surr.)	1	%	-	150	-	151

eurofins | mgt

Client Sample ID			SB07_0.1-0.2	SB07_1.1-1.2	SB06_0.1-0.2	SB06_0.3-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24283	M18-Jl24284	M18-Jl24285	M18-Jl24286
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	-	< 5	-	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	-	< 5	-	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	-	< 5	-	< 5
Sum of WA DER PFAS (n=10)*	10	ug/kg	-	< 10	-	< 10
Sum of PFASs (n=28)*	50	ug/kg	-	< 50	-	< 50
Chromium (hexavalent)	1	mg/kg	< 1	-	-	-
Cyanide (total)	5	mg/kg	< 5	-	-	-
Fluoride	100	mg/kg	120	-	-	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.0	-	-	-
% Moisture	1	%	7.5	18	1.3	15
Heavy Metals						
Arsenic	2	mg/kg	2.8	-	9.5	-
Cadmium	0.4	mg/kg	< 0.4	-	< 0.4	-
Chromium	5	mg/kg	30	-	26	-
Copper	5	mg/kg	10	-	16	-
Lead	5	mg/kg	17	-	< 5	-
Mercury	0.1	mg/kg	< 0.1	-	< 0.1	-
Molybdenum	5	mg/kg	< 5	-	< 5	-
Nickel	5	mg/kg	16	-	13	-
Selenium	2	mg/kg	< 2	-	< 2	-
Silver	0.2	mg/kg	< 0.2	-	< 0.2	-
Tin	10	mg/kg	< 10	-	< 10	-
Zinc	5	mg/kg	25	-	59	-

Client Sample ID			SB06_0.7-0.8	SB05_0.1-0.2	SB05_0.3-0.4	SB05_0.5-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24287	M18-Jl24288	M18-Jl24289	M18-Jl24290
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	-	< 20
TRH C10-C14	20	mg/kg	-	< 20	-	< 20
TRH C15-C28	50	mg/kg	-	< 50	-	< 50
TRH C29-C36	50	mg/kg	-	< 50	-	< 50
TRH C10-36 (Total)	50	mg/kg	-	< 50	-	< 50
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	< 0.5	-	-
1.2.4-Trichlorobenzene	0.5	mg/kg	-	< 0.5	-	-
Hexachlorobutadiene	0.5	mg/kg	-	< 0.5	-	-
1.1-Dichloroethene	0.5	mg/kg	-	< 0.5	-	-
1.1.1-Trichloroethane	0.5	mg/kg	-	< 0.5	-	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	< 0.5	-	-
1.1.2-Trichloroethane	0.5	mg/kg	-	< 0.5	-	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	< 0.5	-	-
1.2-Dibromoethane	0.5	mg/kg	-	< 0.5	-	-
1.2-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	-
1.2-Dichloroethane	0.5	mg/kg	-	< 0.5	-	-

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	SB06_0.7-0.8 Soil M18-Jl24287 Jul 19, 2018	SB05_0.1-0.2 Soil M18-Jl24288 Jul 19, 2018	SB05_0.3-0.4 Soil M18-Jl24289 Jul 19, 2018	SB05_0.5-0.6 Soil M18-Jl24290 Jul 19, 2018
Volatile Organics						
1.2-Dichloropropane	0.5	mg/kg	-	< 0.5	-	-
1.2.3-Trichloropropane	0.5	mg/kg	-	< 0.5	-	-
1.2.4-Trimethylbenzene	0.5	mg/kg	-	< 0.5	-	-
1.3-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	-
1.3-Dichloropropane	0.5	mg/kg	-	< 0.5	-	-
1.3.5-Trimethylbenzene	0.5	mg/kg	-	< 0.5	-	-
1.4-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	-
2-Butanone (MEK)	0.5	mg/kg	-	< 0.5	-	-
2-Propanone (Acetone)	0.5	mg/kg	-	< 0.5	-	-
4-Chlorotoluene	0.5	mg/kg	-	< 0.5	-	-
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	-	< 0.5	-	-
Allyl chloride	0.5	mg/kg	-	< 0.5	-	-
Benzene	0.1	mg/kg	-	< 0.1	-	-
Bromobenzene	0.5	mg/kg	-	< 0.5	-	-
Bromochloromethane	0.5	mg/kg	-	< 0.5	-	-
Bromodichloromethane	0.5	mg/kg	-	< 0.5	-	-
Bromoform	0.5	mg/kg	-	< 0.5	-	-
Bromomethane	0.5	mg/kg	-	< 0.5	-	-
Carbon disulfide	0.5	mg/kg	-	< 0.5	-	-
Carbon Tetrachloride	0.5	mg/kg	-	< 0.5	-	-
Chlorobenzene	0.5	mg/kg	-	< 0.5	-	-
Chloroethane	0.5	mg/kg	-	< 0.5	-	-
Chloroform	0.5	mg/kg	-	< 0.5	-	-
Chloromethane	0.5	mg/kg	-	< 0.5	-	-
cis-1.2-Dichloroethene	0.5	mg/kg	-	< 0.5	-	-
cis-1.3-Dichloropropene	0.5	mg/kg	-	< 0.5	-	-
Dibromochloromethane	0.5	mg/kg	-	< 0.5	-	-
Dibromomethane	0.5	mg/kg	-	< 0.5	-	-
Dichlorodifluoromethane	0.5	mg/kg	-	< 0.5	-	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	-
Iodomethane	0.5	mg/kg	-	< 0.5	-	-
Isopropyl benzene (Cumene)	0.5	mg/kg	-	< 0.5	-	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	-
Methylene Chloride	0.5	mg/kg	-	< 0.5	-	-
o-Xylene	0.1	mg/kg	-	< 0.1	-	-
Styrene	0.5	mg/kg	-	< 0.5	-	-
Tetrachloroethene	0.5	mg/kg	-	< 0.5	-	-
Toluene	0.1	mg/kg	-	< 0.1	-	-
trans-1.2-Dichloroethene	0.5	mg/kg	-	< 0.5	-	-
trans-1.3-Dichloropropene	0.5	mg/kg	-	< 0.5	-	-
Trichloroethene	0.5	mg/kg	-	< 0.5	-	-
Trichlorofluoromethane	0.5	mg/kg	-	< 0.5	-	-
Vinyl chloride	0.5	mg/kg	-	< 0.5	-	-
Xylenes - Total	0.3	mg/kg	-	< 0.3	-	-
Total MAH*	0.5	mg/kg	-	< 0.5	-	-
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	-	< 0.5	-	-
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	-	< 0.5	-	-
4-Bromofluorobenzene (surr.)	1	%	-	102	-	-
Toluene-d8 (surr.)	1	%	-	98	-	-

Client Sample ID			SB06_0.7-0.8	SB05_0.1-0.2	SB05_0.3-0.4	SB05_0.5-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24287	M18-Jl24288	M18-Jl24289	M18-Jl24290
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-	< 0.5
TRH C6-C10	20	mg/kg	-	< 20	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-	< 20
TRH >C10-C16	50	mg/kg	-	< 50	-	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	-	< 50
TRH >C16-C34	100	mg/kg	-	< 100	-	< 100
TRH >C34-C40	100	mg/kg	-	< 100	-	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	1.2
Acenaphthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Chrysene	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluorene	0.5	mg/kg	-	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Total PAH*	0.5	mg/kg	-	< 0.5	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	65	-	74
p-Terphenyl-d14 (surr.)	1	%	-	78	-	84
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	-
a-BHC	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-
b-BHC	0.05	mg/kg	-	< 0.05	-	-
d-BHC	0.05	mg/kg	-	< 0.05	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	-
Endrin ketone	0.05	mg/kg	-	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	-

Client Sample ID			SB06_0.7-0.8	SB05_0.1-0.2	SB05_0.3-0.4	SB05_0.5-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24287	M18-Jl24288	M18-Jl24289	M18-Jl24290
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.05	mg/kg	-	< 0.05	-	-
Toxaphene	1	mg/kg	-	< 1	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	-	72	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	85	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1232	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1242	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1248	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1254	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1260	0.1	mg/kg	-	< 0.1	-	-
Total PCB*	0.1	mg/kg	-	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	-	72	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	85	-	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	< 0.5	-	-
2.4-Dichlorophenol	0.5	mg/kg	-	< 0.5	-	-
2.4.5-Trichlorophenol	1	mg/kg	-	< 1	-	-
2.4.6-Trichlorophenol	1.0	mg/kg	-	< 1	-	-
2.6-Dichlorophenol	0.5	mg/kg	-	< 0.5	-	-
4-Chloro-3-methylphenol	1.0	mg/kg	-	< 1	-	-
Pentachlorophenol	1.0	mg/kg	-	< 1	-	-
Tetrachlorophenols - Total	1.0	mg/kg	-	< 1	-	-
Total Halogenated Phenol*	1	mg/kg	-	< 1	-	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	< 20	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	< 5	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	< 0.2	-	-
2-Nitrophenol	1.0	mg/kg	-	< 1	-	-
2.4-Dimethylphenol	0.5	mg/kg	-	< 0.5	-	-
2.4-Dinitrophenol	5	mg/kg	-	< 5	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	< 0.4	-	-
4-Nitrophenol	5	mg/kg	-	< 5	-	-
Dinoseb	20	mg/kg	-	< 20	-	-
Phenol	0.5	mg/kg	-	< 0.5	-	-
Total Non-Halogenated Phenol*	20	mg/kg	-	< 20	-	-
Phenol-d6 (surr.)	1	%	-	64	-	-
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)N11	5	ug/kg	< 5	-	< 5	-
Perfluoropentanoic acid (PFPeA)N11	5	ug/kg	< 5	-	< 5	-
Perfluorohexanoic acid (PFHxA)N11	5	ug/kg	< 5	-	< 5	-
Perfluoroheptanoic acid (PFHpA)N11	5	ug/kg	< 5	-	< 5	-
Perfluorooctanoic acid (PFOA)N11	5	ug/kg	< 5	-	< 5	-

Client Sample ID			SB06_0.7-0.8	SB05_0.1-0.2	SB05_0.3-0.4	SB05_0.5-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-JI24287	M18-JI24288	M18-JI24289	M18-JI24290
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	-	< 5	-
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	-	< 5	-
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	-	< 5	-
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	-	< 5	-
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	-	< 5	-
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	-	< 5	-
13C4-PFBA (surr.)	1	%	123	-	99	-
13C5-PFPeA (surr.)	1	%	116	-	105	-
13C5-PFHxA (surr.)	1	%	145	-	131	-
13C4-PFHpA (surr.)	1	%	113	-	101	-
13C8-PFOA (surr.)	1	%	109	-	97	-
13C5-PFNA (surr.)	1	%	138	-	120	-
13C6-PFDA (surr.)	1	%	138	-	112	-
13C2-PFUnDA (surr.)	1	%	140	-	121	-
13C2-PFDoDA (surr.)	1	%	133	-	112	-
13C2-PFTeDA (surr.)	1	%	147	-	121	-
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	-	< 5	-
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	-	< 5	-
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	-	< 5	-
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	5	ug/kg	< 5	-	< 5	-
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	5	ug/kg	< 5	-	< 5	-
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	-	< 10	-
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	-	< 10	-
13C8-FOSA (surr.)	1	%	111	-	92	-
D3-N-MeFOSA (surr.)	1	%	111	-	85	-
D5-N-EtFOSA (surr.)	1	%	113	-	182	-
D7-N-MeFOSE (surr.)	1	%	146	-	112	-
D9-N-EtFOSE (surr.)	1	%	146	-	114	-
D5-N-EtFOSAA (surr.)	1	%	125	-	113	-
D3-N-MeFOSAA (surr.)	1	%	141	-	114	-
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	-	< 5	-
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	-	< 5	-
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	-	< 5	-
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	-	< 5	-
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	-	< 5	-
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	-	< 5	-
13C3-PFBS (surr.)	1	%	134	-	124	-
18O2-PFHxS (surr.)	1	%	126	-	118	-
13C8-PFOS (surr.)	1	%	140	-	120	-

eurofins mgt

Client Sample ID			SB06_0.7-0.8	SB05_0.1-0.2	SB05_0.3-0.4	SB05_0.5-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24287	M18-Jl24288	M18-Jl24289	M18-Jl24290
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)N11	5	ug/kg	< 5	-	< 5	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)N11	10	ug/kg	< 10	-	< 10	-
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)N11	5	ug/kg	< 5	-	< 5	-
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)N15	5	ug/kg	< 5	-	< 5	-
13C2-4:2 FTSA (surr.)	1	%	111	-	118	-
13C2-6:2 FTSA (surr.)	1	%	120	-	135	-
13C2-8:2 FTSA (surr.)	1	%	180	-	151	-
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	-	< 5	-
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	-	< 5	-
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	-	< 5	-
Sum of WA DER PFAS (n=10)*	10	ug/kg	< 10	-	< 10	-
Sum of PFASs (n=28)*	50	ug/kg	< 50	-	< 50	-
Chromium (hexavalent)	1	mg/kg	-	< 1	-	-
Cyanide (total)	5	mg/kg	-	< 5	-	-
Fluoride	100	mg/kg	-	190	-	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	7.9	-	-
% Moisture	1	%	15	2.8	12	17
Heavy Metals						
Arsenic	2	mg/kg	-	16	-	2.1
Cadmium	0.4	mg/kg	-	< 0.4	-	< 0.4
Chromium	5	mg/kg	-	37	-	59
Copper	5	mg/kg	-	20	-	15
Lead	5	mg/kg	-	< 5	-	12
Mercury	0.1	mg/kg	-	< 0.1	-	< 0.1
Molybdenum	5	mg/kg	-	< 5	-	< 5
Nickel	5	mg/kg	-	19	-	50
Selenium	2	mg/kg	-	< 2	-	< 2
Silver	0.2	mg/kg	-	< 0.2	-	< 0.2
Tin	10	mg/kg	-	< 10	-	< 10
Zinc	5	mg/kg	-	67	-	21

Client Sample ID			SB04_0.1-0.2	SB04_1.0-1.1	SB03_0.1-0.2	SB03_0.2-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24291	M18-Jl24292	M18-Jl24293	M18-Jl24294
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50

eurofins | mgt

Client Sample ID			SB04_0.1-0.2	SB04_1.0-1.1	SB03_0.1-0.2	SB03_0.2-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24291	M18-Jl24292	M18-Jl24293	M18-Jl24294
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.2.4-Trichlorobenzene	0.5	mg/kg	-	-	-	< 0.5
Hexachlorobutadiene	0.5	mg/kg	-	-	-	< 0.5
1.1-Dichloroethene	0.5	mg/kg	-	-	-	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	-	-	< 0.5
1.2-Dibromoethane	0.5	mg/kg	-	-	-	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	-	-	-	< 0.5
1.2-Dichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.2-Dichloropropane	0.5	mg/kg	-	-	-	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	-	-	-	< 0.5
1.2.4-Trimethylbenzene	0.5	mg/kg	-	-	-	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	-	-	-	< 0.5
1.3-Dichloropropane	0.5	mg/kg	-	-	-	< 0.5
1.3.5-Trimethylbenzene	0.5	mg/kg	-	-	-	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	-	-	-	< 0.5
2-Butanone (MEK)	0.5	mg/kg	-	-	-	< 0.5
2-Propanone (Acetone)	0.5	mg/kg	-	-	-	< 0.5
4-Chlorotoluene	0.5	mg/kg	-	-	-	< 0.5
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	-	-	-	< 0.5
Allyl chloride	0.5	mg/kg	-	-	-	< 0.5
Benzene	0.1	mg/kg	-	-	-	< 0.1
Bromobenzene	0.5	mg/kg	-	-	-	< 0.5
Bromochloromethane	0.5	mg/kg	-	-	-	< 0.5
Bromodichloromethane	0.5	mg/kg	-	-	-	< 0.5
Bromoform	0.5	mg/kg	-	-	-	< 0.5
Bromomethane	0.5	mg/kg	-	-	-	< 0.5
Carbon disulfide	0.5	mg/kg	-	-	-	< 0.5
Carbon Tetrachloride	0.5	mg/kg	-	-	-	< 0.5
Chlorobenzene	0.5	mg/kg	-	-	-	< 0.5
Chloroethane	0.5	mg/kg	-	-	-	< 0.5
Chloroform	0.5	mg/kg	-	-	-	< 0.5
Chloromethane	0.5	mg/kg	-	-	-	< 0.5
cis-1.2-Dichloroethene	0.5	mg/kg	-	-	-	< 0.5
cis-1.3-Dichloropropene	0.5	mg/kg	-	-	-	< 0.5
Dibromochloromethane	0.5	mg/kg	-	-	-	< 0.5
Dibromomethane	0.5	mg/kg	-	-	-	< 0.5
Dichlorodifluoromethane	0.5	mg/kg	-	-	-	< 0.5
Ethylbenzene	0.1	mg/kg	-	-	-	< 0.1
Iodomethane	0.5	mg/kg	-	-	-	< 0.5
Isopropyl benzene (Cumene)	0.5	mg/kg	-	-	-	< 0.5
m&p-Xylenes	0.2	mg/kg	-	-	-	< 0.2
Methylene Chloride	0.5	mg/kg	-	-	-	< 0.5
o-Xylene	0.1	mg/kg	-	-	-	< 0.1
Styrene	0.5	mg/kg	-	-	-	< 0.5
Tetrachloroethene	0.5	mg/kg	-	-	-	< 0.5
Toluene	0.1	mg/kg	-	-	-	< 0.1

eurofins | mgt

Client Sample ID			SB04_0.1-0.2	SB04_1.0-1.1	SB03_0.1-0.2	SB03_0.2-0.3
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jl24291**	**M18-Jl24292**	**M18-Jl24293**	**M18-Jl24294**
Date Sampled			**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**
Test/Reference	LOR	Unit				
Volatile Organics						
trans-1.2-Dichloroethene	0.5	mg/kg	-	-	-	< 0.5
trans-1.3-Dichloropropene	0.5	mg/kg	-	-	-	< 0.5
Trichloroethene	0.5	mg/kg	-	-	-	< 0.5
Trichlorofluoromethane	0.5	mg/kg	-	-	-	< 0.5
Vinyl chloride	0.5	mg/kg	-	-	-	< 0.5
Xylenes - Total	0.3	mg/kg	-	-	-	< 0.3
Total MAH*	0.5	mg/kg	-	-	-	< 0.5
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	-	-	-	< 0.5
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	-	-	-	< 0.5
4-Bromofluorobenzene (surr.)	1	%	-	-	-	120
Toluene-d8 (surr.)	1	%	-	-	-	112
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	108	131	69	83
p-Terphenyl-d14 (surr.)	1	%	119	86	87	95
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-BHC	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05

eurofins | mgt

Client Sample ID			SB04_0.1-0.2	SB04_1.0-1.1	SB03_0.1-0.2	SB03_0.2-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24291	M18-Jl24292	M18-Jl24293	M18-Jl24294
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
b-BHC	0.05	mg/kg	-	-	-	< 0.05
d-BHC	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.05	mg/kg	-	-	-	< 0.05
Toxaphene	1	mg/kg	-	-	-	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	-	-	65
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	88
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1221	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1232	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1242	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1248	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1254	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1260	0.1	mg/kg	-	-	-	< 0.1
Total PCB*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	-	-	65
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	88
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	-	-	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	-	-	-	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	-	-	-	< 1
2.4.6-Trichlorophenol	1.0	mg/kg	-	-	-	< 1
2.6-Dichlorophenol	0.5	mg/kg	-	-	-	< 0.5
4-Chloro-3-methylphenol	1.0	mg/kg	-	-	-	< 1
Pentachlorophenol	1.0	mg/kg	-	-	-	< 1
Tetrachlorophenols - Total	1.0	mg/kg	-	-	-	< 1
Total Halogenated Phenol*	1	mg/kg	-	-	-	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	-	-	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	-	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	-	< 0.2
2-Nitrophenol	1.0	mg/kg	-	-	-	< 1
2.4-Dimethylphenol	0.5	mg/kg	-	-	-	< 0.5
2.4-Dinitrophenol	5	mg/kg	-	-	-	< 5

Client Sample ID			SB04_0.1-0.2	SB04_1.0-1.1	SB03_0.1-0.2	SB03_0.2-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24291	M18-Jl24292	M18-Jl24293	M18-Jl24294
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	-	< 0.4
4-Nitrophenol	5	mg/kg	-	-	-	< 5
Dinoseb	20	mg/kg	-	-	-	< 20
Phenol	0.5	mg/kg	-	-	-	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	-	-	-	< 20
Phenol-d6 (surr.)	1	%	-	-	-	78
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	-	-	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	-	-	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	-	-	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	-	-	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	-	-	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	-	-	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	-	-	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	-	-	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	-	-	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	-	-	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	-	-	< 5
13C4-PFBA (surr.)	1	%	129	-	-	121
13C5-PFPeA (surr.)	1	%	116	-	-	110
13C5-PFHxA (surr.)	1	%	144	-	-	135
13C4-PFHpA (surr.)	1	%	110	-	-	108
13C8-PFOA (surr.)	1	%	108	-	-	104
13C5-PFNA (surr.)	1	%	135	-	-	130
13C6-PFDA (surr.)	1	%	126	-	-	131
13C2-PFUnDA (surr.)	1	%	133	-	-	128
13C2-PFDoDA (surr.)	1	%	132	-	-	124
13C2-PFTeDA (surr.)	1	%	142	-	-	139
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	-	-	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	-	-	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	-	-	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	5	ug/kg	< 5	-	-	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	5	ug/kg	< 5	-	-	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	-	-	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	-	-	< 10
13C8-FOSA (surr.)	1	%	107	-	-	101
D3-N-MeFOSA (surr.)	1	%	101	-	-	100
D5-N-EtFOSA (surr.)	1	%	118	-	-	169
D7-N-MeFOSE (surr.)	1	%	132	-	-	128
D9-N-EtFOSE (surr.)	1	%	147	-	-	127
D5-N-EtFOSAA (surr.)	1	%	123	-	-	128
D3-N-MeFOSAA (surr.)	1	%	136	-	-	140

Client Sample ID			SB04_0.1-0.2	SB04_1.0-1.1	SB03_0.1-0.2	SB03_0.2-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24291	M18-Jl24292	M18-Jl24293	M18-Jl24294
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	-	-	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	-	-	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	-	-	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	-	-	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	-	-	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	-	-	< 5
13C3-PFBS (surr.)	1	%	133	-	-	129
18O2-PFHxS (surr.)	1	%	126	-	-	119
13C8-PFOS (surr.)	1	%	134	-	-	133
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	-	-	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	10	ug/kg	< 10	-	-	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	-	-	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	5	ug/kg	< 5	-	-	< 5
13C2-4:2 FTSA (surr.)	1	%	116	-	-	105
13C2-6:2 FTSA (surr.)	1	%	123	-	-	103
13C2-8:2 FTSA (surr.)	1	%	151	-	-	165
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	-	-	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	-	-	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	-	-	< 5
Sum of WA DER PFAS (n=10)*	10	ug/kg	< 10	-	-	< 10
Sum of PFASs (n=28)*	50	ug/kg	< 50	-	-	< 50
Chromium (hexavalent)	1	mg/kg	-	-	-	< 1
Cyanide (total)	5	mg/kg	-	-	-	< 5
Fluoride	100	mg/kg	-	-	-	100
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	-	-	7.7
% Moisture	1	%	3.0	14	5.3	9.6
Heavy Metals						
Arsenic	2	mg/kg	28	< 2	18	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	32	36	34	26
Copper	5	mg/kg	20	5.6	15	< 5
Lead	5	mg/kg	5.1	5.6	< 5	8.4
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	18	34	16	7.5
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tin	10	mg/kg	< 10	< 10	< 10	< 10
Zinc	5	mg/kg	66	19	55	9.6

Client Sample ID			SB03_1.6-1.7	SB02_0.1-0.2	SB02_0.3-0.4	SS01
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24295	M18-Jl24296	M18-Jl24297	M18-Jl24298
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	-	-
TRH C10-C14	20	mg/kg	-	< 20	-	-
TRH C15-C28	50	mg/kg	-	< 50	-	-
TRH C29-C36	50	mg/kg	-	< 50	-	-
TRH C10-36 (Total)	50	mg/kg	-	< 50	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-	-
TRH C6-C10	20	mg/kg	-	< 20	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-	-
TRH >C10-C16	50	mg/kg	-	< 50	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	-	-
TRH >C16-C34	100	mg/kg	-	< 100	-	-
TRH >C34-C40	100	mg/kg	-	< 100	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	-
Acenaphthene	0.5	mg/kg	-	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	-
Anthracene	0.5	mg/kg	-	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Chrysene	0.5	mg/kg	-	< 0.5	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	-	-
Fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Fluorene	0.5	mg/kg	-	< 0.5	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	-
Naphthalene	0.5	mg/kg	-	< 0.5	-	-
Phenanthrene	0.5	mg/kg	-	< 0.5	-	-
Pyrene	0.5	mg/kg	-	< 0.5	-	-
Total PAH*	0.5	mg/kg	-	< 0.5	-	-
2-Fluorobiphenyl (surr.)	1	%	-	74	-	-
p-Terphenyl-d14 (surr.)	1	%	-	92	-	-
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	118	68	85	87

Client Sample ID			SB03_1.6-1.7	SB02_0.1-0.2	SB02_0.3-0.4	SS01
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24295	M18-Jl24296	M18-Jl24297	M18-Jl24298
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C5-PFPeA (surr.)	1	%	115	76	86	83
13C5-PFHxA (surr.)	1	%	144	105	104	99
13C4-PFHpA (surr.)	1	%	112	80	78	74
13C8-PFOA (surr.)	1	%	106	79	76	64
13C5-PFNA (surr.)	1	%	135	93	90	75
13C6-PFDA (surr.)	1	%	144	90	96	63
13C2-PFUnDA (surr.)	1	%	134	95	91	53
13C2-PFDoDA (surr.)	1	%	141	96	86	35
13C2-PFTeDA (surr.)	1	%	132	97	98	29
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	105	77	86	32
D3-N-MeFOSA (surr.)	1	%	120	75	78	43
D5-N-EtFOSA (surr.)	1	%	166	92	132	37
D7-N-MeFOSE (surr.)	1	%	141	99	102	44
D9-N-EtFOSE (surr.)	1	%	145	102	101	38
D5-N-EtFOSAA (surr.)	1	%	119	91	88	38
D3-N-MeFOSAA (surr.)	1	%	138	92	101	31
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	136	99	96	94
18O2-PFHxS (surr.)	1	%	128	90	88	82
13C8-PFOS (surr.)	1	%	138	97	94	79
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	114	97	88	90
13C2-6:2 FTSA (surr.)	1	%	129	93	93	78
13C2-8:2 FTSA (surr.)	1	%	166	120	121	58

Client Sample ID			SB03_1.6-1.7	SB02_0.1-0.2	SB02_0.3-0.4	SS01
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jl24295**	**M18-Jl24296**	**M18-Jl24297**	**M18-Jl24298**
Date Sampled			**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=28)*	50	ug/kg	< 50	< 50	< 50	< 50
% Moisture	1	%	17	6.8	4.7	4.6
Heavy Metals						
Arsenic	2	mg/kg	-	< 2	-	-
Cadmium	0.4	mg/kg	-	< 0.4	-	-
Chromium	5	mg/kg	-	19	-	-
Copper	5	mg/kg	-	33	-	-
Lead	5	mg/kg	-	< 5	-	-
Mercury	0.1	mg/kg	-	< 0.1	-	-
Molybdenum	5	mg/kg	-	< 5	-	-
Nickel	5	mg/kg	-	110	-	-
Selenium	2	mg/kg	-	< 2	-	-
Silver	0.2	mg/kg	-	< 0.2	-	-
Tin	10	mg/kg	-	< 10	-	-
Zinc	5	mg/kg	-	54	-	-

Client Sample ID			SS02	QA1	QA3	QA5
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jl24299**	**M18-Jl24300**	**M18-Jl24302**	**M18-Jl24304**
Date Sampled			**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	-	< 20
TRH C10-C14	20	mg/kg	23	-	-	< 20
TRH C15-C28	50	mg/kg	160	-	-	< 50
TRH C29-C36	50	mg/kg	220	-	-	< 50
TRH C10-36 (Total)	50	mg/kg	403	-	-	< 50
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.2.4-Trichlorobenzene	0.5	mg/kg	-	-	-	< 0.5
Hexachlorobutadiene	0.5	mg/kg	-	-	-	< 0.5
1.1-Dichloroethene	0.5	mg/kg	-	-	-	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	-	-	< 0.5
1.2-Dibromoethane	0.5	mg/kg	-	-	-	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	-	-	-	< 0.5
1.2-Dichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.2-Dichloropropane	0.5	mg/kg	-	-	-	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	-	-	-	< 0.5
1.2.4-Trimethylbenzene	0.5	mg/kg	-	-	-	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	-	-	-	< 0.5

eurofins | mgt

Client Sample ID			SS02	QA1	QA3	QA5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24299	M18-Jl24300	M18-Jl24302	M18-Jl24304
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Volatile Organics						
1.3-Dichloropropane	0.5	mg/kg	-	-	-	< 0.5
1.3.5-Trimethylbenzene	0.5	mg/kg	-	-	-	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	-	-	-	< 0.5
2-Butanone (MEK)	0.5	mg/kg	-	-	-	< 0.5
2-Propanone (Acetone)	0.5	mg/kg	-	-	-	< 0.5
4-Chlorotoluene	0.5	mg/kg	-	-	-	< 0.5
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	-	-	-	< 0.5
Allyl chloride	0.5	mg/kg	-	-	-	< 0.5
Benzene	0.1	mg/kg	-	-	-	< 0.1
Bromobenzene	0.5	mg/kg	-	-	-	< 0.5
Bromochloromethane	0.5	mg/kg	-	-	-	< 0.5
Bromodichloromethane	0.5	mg/kg	-	-	-	< 0.5
Bromoform	0.5	mg/kg	-	-	-	< 0.5
Bromomethane	0.5	mg/kg	-	-	-	< 0.5
Carbon disulfide	0.5	mg/kg	-	-	-	< 0.5
Carbon Tetrachloride	0.5	mg/kg	-	-	-	< 0.5
Chlorobenzene	0.5	mg/kg	-	-	-	< 0.5
Chloroethane	0.5	mg/kg	-	-	-	< 0.5
Chloroform	0.5	mg/kg	-	-	-	< 0.5
Chloromethane	0.5	mg/kg	-	-	-	< 0.5
cis-1.2-Dichloroethene	0.5	mg/kg	-	-	-	< 0.5
cis-1.3-Dichloropropene	0.5	mg/kg	-	-	-	< 0.5
Dibromochloromethane	0.5	mg/kg	-	-	-	< 0.5
Dibromomethane	0.5	mg/kg	-	-	-	< 0.5
Dichlorodifluoromethane	0.5	mg/kg	-	-	-	< 0.5
Ethylbenzene	0.1	mg/kg	-	-	-	< 0.1
Iodomethane	0.5	mg/kg	-	-	-	< 0.5
Isopropyl benzene (Cumene)	0.5	mg/kg	-	-	-	< 0.5
m&p-Xylenes	0.2	mg/kg	-	-	-	< 0.2
Methylene Chloride	0.5	mg/kg	-	-	-	< 0.5
o-Xylene	0.1	mg/kg	-	-	-	< 0.1
Styrene	0.5	mg/kg	-	-	-	< 0.5
Tetrachloroethene	0.5	mg/kg	-	-	-	< 0.5
Toluene	0.1	mg/kg	-	-	-	< 0.1
trans-1.2-Dichloroethene	0.5	mg/kg	-	-	-	< 0.5
trans-1.3-Dichloropropene	0.5	mg/kg	-	-	-	< 0.5
Trichloroethene	0.5	mg/kg	-	-	-	< 0.5
Trichlorofluoromethane	0.5	mg/kg	-	-	-	< 0.5
Vinyl chloride	0.5	mg/kg	-	-	-	< 0.5
Xylenes - Total	0.3	mg/kg	-	-	-	< 0.3
Total MAH*	0.5	mg/kg	-	-	-	< 0.5
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	-	-	-	< 0.5
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	-	-	-	< 0.5
4-Bromofluorobenzene (surr.)	1	%	-	-	-	109
Toluene-d8 (surr.)	1	%	-	-	-	102

eurofins | mgt

Client Sample ID			SS02	QA1	QA3	QA5
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jl24299**	**M18-Jl24300**	**M18-Jl24302**	**M18-Jl24304**
Date Sampled			**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	-	< 0.5
TRH C6-C10	20	mg/kg	< 20	-	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	-	< 20
TRH >C10-C16	50	mg/kg	< 50	-	-	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	-	< 50
TRH >C16-C34	100	mg/kg	290	-	-	< 100
TRH >C34-C40	100	mg/kg	120	-	-	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	-	1.2
Acenaphthene	0.5	mg/kg	< 0.5	-	-	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	-	-	< 0.5
Anthracene	0.5	mg/kg	< 0.5	-	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	-	< 0.5
Chrysene	0.5	mg/kg	< 0.5	-	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	-	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	-	-	< 0.5
Fluorene	0.5	mg/kg	< 0.5	-	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	-	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	-	-	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	-	-	< 0.5
Pyrene	0.5	mg/kg	< 0.5	-	-	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	-	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	69	-	-	73
p-Terphenyl-d14 (surr.)	1	%	76	-	-	86
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-BHC	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-BHC	0.05	mg/kg	-	-	-	< 0.05
d-BHC	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05

Client Sample ID			SS02	QA1	QA3	QA5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24299	M18-Jl24300	M18-Jl24302	M18-Jl24304
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.05	mg/kg	-	-	-	< 0.05
Toxaphene	1	mg/kg	-	-	-	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	-	-	69
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	78
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1221	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1232	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1242	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1248	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1254	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1260	0.1	mg/kg	-	-	-	< 0.1
Total PCB*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	-	-	69
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	78
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	-	-	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	-	-	-	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	-	-	-	< 1
2.4.6-Trichlorophenol	1.0	mg/kg	-	-	-	< 1
2.6-Dichlorophenol	0.5	mg/kg	-	-	-	< 0.5
4-Chloro-3-methylphenol	1.0	mg/kg	-	-	-	< 1
Pentachlorophenol	1.0	mg/kg	-	-	-	< 1
Tetrachlorophenols - Total	1.0	mg/kg	-	-	-	< 1
Total Halogenated Phenol*	1	mg/kg	-	-	-	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	-	-	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	-	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	-	< 0.2
2-Nitrophenol	1.0	mg/kg	-	-	-	< 1
2.4-Dimethylphenol	0.5	mg/kg	-	-	-	< 0.5
2.4-Dinitrophenol	5	mg/kg	-	-	-	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	-	< 0.4
4-Nitrophenol	5	mg/kg	-	-	-	< 5
Dinoseb	20	mg/kg	-	-	-	< 20
Phenol	0.5	mg/kg	-	-	-	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	-	-	-	< 20
Phenol-d6 (surr.)	1	%	-	-	-	69
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	-
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	-
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	-
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	-
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	-

eurofins | mgt

Client Sample ID			SS02	QA1	QA3	QA5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24299	M18-Jl24300	M18-Jl24302	M18-Jl24304
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorononanoic acid (PFNA)N11	5	ug/kg	< 5	< 5	< 5	-
Perfluorodecanoic acid (PFDA)N11	5	ug/kg	< 5	< 5	< 5	-
Perfluoroundecanoic acid (PFUnDA)N11	5	ug/kg	< 5	< 5	< 5	-
Perfluorododecanoic acid (PFDoDA)N11	5	ug/kg	< 5	< 5	< 5	-
Perfluorotridecanoic acid (PFTrDA)N15	5	ug/kg	< 5	< 5	< 5	-
Perfluorotetradecanoic acid (PFTeDA)N11	5	ug/kg	< 5	< 5	< 5	-
13C4-PFBA (surr.)	1	%	85	85	73	-
13C5-PFPeA (surr.)	1	%	81	72	73	-
13C5-PFHxA (surr.)	1	%	101	92	97	-
13C4-PFHpA (surr.)	1	%	78	69	74	-
13C8-PFOA (surr.)	1	%	73	68	71	-
13C5-PFNA (surr.)	1	%	88	87	86	-
13C6-PFDA (surr.)	1	%	77	76	83	-
13C2-PFUnDA (surr.)	1	%	70	72	77	-
13C2-PFDoDA (surr.)	1	%	57	66	77	-
13C2-PFTeDA (surr.)	1	%	47	56	71	-
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)N11	5	ug/kg	< 5	< 5	< 5	-
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)N11	5	ug/kg	< 5	< 5	< 5	-
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)N11	5	ug/kg	< 5	< 5	< 5	-
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)N11	5	ug/kg	< 5	< 5	< 5	-
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)N11	5	ug/kg	< 5	< 5	< 5	-
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)N11	10	ug/kg	< 10	< 10	< 10	-
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)N11	10	ug/kg	< 10	< 10	< 10	-
13C8-FOSA (surr.)	1	%	51	48	59	-
D3-N-MeFOSA (surr.)	1	%	57	55	67	-
D5-N-EtFOSA (surr.)	1	%	59	80	128	-
D7-N-MeFOSE (surr.)	1	%	60	66	77	-
D9-N-EtFOSE (surr.)	1	%	50	65	77	-
D5-N-EtFOSAA (surr.)	1	%	61	67	67	-
D3-N-MeFOSAA (surr.)	1	%	60	74	76	-
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)N11	5	ug/kg	< 5	< 5	< 5	-
Perfluoropentanesulfonic acid (PFPeS)N15	5	ug/kg	< 5	< 5	< 5	-
Perfluorohexanesulfonic acid (PFHxS)N11	5	ug/kg	< 5	< 5	< 5	-
Perfluoroheptanesulfonic acid (PFHpS)N15	5	ug/kg	< 5	< 5	< 5	-
Perfluorooctanesulfonic acid (PFOS)N11	5	ug/kg	N09 5.2	< 5	< 5	-
Perfluorodecanesulfonic acid (PFDS)N15	5	ug/kg	< 5	< 5	< 5	-
13C3-PFBS (surr.)	1	%	96	86	94	-
18O2-PFHxS (surr.)	1	%	89	77	83	-
13C8-PFOS (surr.)	1	%	92	79	89	-

Client Sample ID			SS02	QA1	QA3	QA5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jl24299	M18-Jl24300	M18-Jl24302	M18-Jl24304
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	-
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	-
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	5	ug/kg	< 5	< 5	< 5	-
13C2-4:2 FTSA (surr.)	1	%	92	75	87	-
13C2-6:2 FTSA (surr.)	1	%	104	79	91	-
13C2-8:2 FTSA (surr.)	1	%	110	114	115	-
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	5.2	< 5	< 5	-
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	5.2	< 5	< 5	-
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	5.2	< 5	< 5	-
Sum of WA DER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	-
Sum of PFASs (n=28)*	50	ug/kg	< 50	< 50	< 50	-
Chromium (hexavalent)	1	mg/kg	-	-	-	< 1
Cyanide (total)	5	mg/kg	-	-	-	< 5
Fluoride	100	mg/kg	-	-	-	150
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	-	-	7.8
% Moisture	1	%	20	5.9	9.9	2.0
Heavy Metals						
Arsenic	2	mg/kg	3.7	-	-	19
Cadmium	0.4	mg/kg	< 0.4	-	-	< 0.4
Chromium	5	mg/kg	42	-	-	32
Copper	5	mg/kg	31	-	-	17
Lead	5	mg/kg	35	-	-	< 5
Mercury	0.1	mg/kg	< 0.1	-	-	< 0.1
Molybdenum	5	mg/kg	< 5	-	-	< 5
Nickel	5	mg/kg	48	-	-	17
Selenium	2	mg/kg	< 2	-	-	< 2
Silver	0.2	mg/kg	< 0.2	-	-	< 0.2
Tin	10	mg/kg	< 10	-	-	< 10
Zinc	5	mg/kg	390	-	-	58

Client Sample ID			SB07_0.5-0.6
Sample Matrix			Soil
Eurofins | mgt Sample No.			M18-Jl24326
Date Sampled			Jul 19, 2018
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-36 (Total)	50	mg/kg	< 50

eurofins | mgt

Client Sample ID			SB07_0.5-0.6
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**M18-Jl24326**
Date Sampled			**Jul 19, 2018**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	74
p-Terphenyl-d14 (surr.)	1	%	83
% Moisture	1	%	10.0
Heavy Metals			
Arsenic	2	mg/kg	< 2
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	14
Copper	5	mg/kg	< 5
Lead	5	mg/kg	6.7
Mercury	0.1	mg/kg	< 0.1
Molybdenum	5	mg/kg	< 5
Nickel	5	mg/kg	6.3
Selenium	2	mg/kg	< 2
Silver	0.2	mg/kg	< 0.2
Tin	10	mg/kg	< 10
Zinc	5	mg/kg	7.7

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Vic EPA IWRG 621 (Solids)			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jul 23, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C36			
Volatile Organics	Melbourne	Jul 23, 2018	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jul 23, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jul 23, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Jul 23, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Organochlorine Pesticides	Melbourne	Jul 23, 2018	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Melbourne	Jul 23, 2018	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Phenols (Halogenated)	Melbourne	Jul 23, 2018	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Melbourne	Jul 23, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Chromium (hexavalent)	Melbourne	Jul 23, 2018	28 Day
- Method: APHA 3500-Cr Hexavalent Chromium- (Extraction:- USEPA3060)			
Cyanide (total)	Melbourne	Jul 23, 2018	14 Day
- Method: LTM-INO-4020 Total Free WAD Cyanide by CFA			
Fluoride	Melbourne	Jul 24, 2018	28 Day
- Method: LTM-INO-4150 Determination of Total Fluoride PART A – CIC			
pH (1:5 Aqueous extract at 25°C as rec.)	Melbourne	Jul 23, 2018	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
Metals IWRG 621 : Metals M12	Melbourne	Jul 23, 2018	28 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Jul 24, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Jul 24, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Jul 24, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Jul 24, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
% Moisture	Melbourne	Jul 21, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name:	Senversa Pty Ltd VIC	**Order No.:**		**Received:**	Jul 20, 2018 12:35 PM
Address:	Level 6, 15 Williams St	**Report #:**	608706	**Due:**	Jul 27, 2018
	Melbourne	**Phone:**	9606 0070	**Priority:**	5 Day
	VIC 3000	**Fax:**		**Contact Name:**	Samuel O'Connor
Project Name:	ARUP CONTAMINATION ASSESSMENT				
Project ID:	M16733				

Eurofins | mgt Analytical Services Manager : Natalie Krasselt

Sample Detail						CANCELLED	HOLD	HOLD	Polycyclic Aromatic Hydrocarbons	Metals IWRG 621 : Metals M12	Moisture Set	Moisture Set	Total Recoverable Hydrocarbons	Vic EPA IWRG 621 (Solids)	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X		X	X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794								X			X	X			X
Perth Laboratory - NATA Site # 23736															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	SB01_0.0-0.1	Jul 19, 2018		Soil	M18-Jl24279				X	X	X		X		X
2	SB01_0.4-0.5	Jul 19, 2018		Soil	M18-Jl24280						X			X	X
3	SB01_1.1-1.2	Jul 19, 2018		Soil	M18-Jl24281				X	X	X		X		
4	SB07_0.0-0.1	Jul 19, 2018		Soil	M18-Jl24282							X			X
5	SB07_0.1-0.2	Jul 19, 2018		Soil	M18-Jl24283						X			X	
6	SB07_1.1-1.2	Jul 19, 2018		Soil	M18-Jl24284							X			X
7	SB06_0.1-0.2	Jul 19, 2018		Soil	M18-Jl24285				X	X	X		X		
8	SB06_0.3-0.4	Jul 19, 2018		Soil	M18-Jl24286							X			X
9	SB06_0.7-0.8	Jul 19, 2018		Soil	M18-Jl24287							X			X

Company Name: Senversa Pty Ltd VIC
Address: Level 6, 15 Williams St
Melbourne
VIC 3000

Project Name: ARUP CONTAMINATION ASSESSMENT
Project ID: M16733

Order No.:
Report #: 608706
Phone: 9606 0070
Fax:

Received: Jul 20, 2018 12:35 PM
Due: Jul 27, 2018
Priority: 5 Day
Contact Name: Samuel O'Connor

Eurofins | mgt Analytical Services Manager : Natalie Krasselt

Sample Detail						CANCELLED	HOLD	HOLD	Polycyclic Aromatic Hydrocarbons	Metals IWRG 621 : Metals M12	Moisture Set	Moisture Set	Total Recoverable Hydrocarbons	Vic EPA IWRG 621 (Solids)	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X		X	X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794								X			X	X			X
Perth Laboratory - NATA Site # 23736															
10	SB05_0.1-0.2	Jul 19, 2018		Soil	M18-Jl24288						X			X	
11	SB05_0.3-0.4	Jul 19, 2018		Soil	M18-Jl24289							X			X
12	SB05_0.5-0.6	Jul 19, 2018		Soil	M18-Jl24290				X	X	X		X		
13	SB04_0.1-0.2	Jul 19, 2018		Soil	M18-Jl24291				X	X	X		X		X
14	SB04_1.0-1.1	Jul 19, 2018		Soil	M18-Jl24292				X	X	X		X		
15	SB03_0.1-0.2	Jul 19, 2018		Soil	M18-Jl24293				X	X	X		X		
16	SB03_0.2-0.3	Jul 19, 2018		Soil	M18-Jl24294						X			X	X
17	SB03_1.6-1.7	Jul 19, 2018		Soil	M18-Jl24295							X			X
18	SB02_0.1-0.2	Jul 19, 2018		Soil	M18-Jl24296				X	X	X		X		X
19	SB02_0.3-0.4	Jul 19, 2018		Soil	M18-Jl24297							X			X
20	SS01	Jul 19, 2018		Soil	M18-Jl24298							X			X
21	SS02	Jul 19, 2018		Soil	M18-Jl24299				X	X	X		X		X

Company Name:	Senversa Pty Ltd VIC	**Order No.:**		**Received:**	Jul 20, 2018 12:35 PM
Address:	Level 6, 15 Williams St	**Report #:**	608706	**Due:**	Jul 27, 2018
	Melbourne	**Phone:**	9606 0070	**Priority:**	5 Day
	VIC 3000	**Fax:**		**Contact Name:**	Samuel O'Connor
Project Name:	ARUP CONTAMINATION ASSESSMENT				
Project ID:	M16733				

Eurofins | mgt Analytical Services Manager : Natalie Krasselt

Sample Detail						CANCELLED	HOLD	HOLD	Polycyclic Aromatic Hydrocarbons	Metals IWRG 621 : Metals M12	Moisture Set	Moisture Set	Total Recoverable Hydrocarbons	Vic EPA IWRG 621 (Solids)	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X		X	X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794								X			X	X			X
Perth Laboratory - NATA Site # 23736															
22	QA1	Jul 19, 2018		Soil	M18-Jl24300							X			X
23	QA2	Jul 19, 2018		Soil	M18-Jl24301	X									
24	QA3	Jul 19, 2018		Soil	M18-Jl24302							X			X
25	QA4	Jul 19, 2018		Soil	M18-Jl24303	X									
26	QA5	Jul 19, 2018		Soil	M18-Jl24304						X			X	
27	QA6	Jul 19, 2018		Soil	M18-Jl24305	X									
28	SB07_0.6-0.7	Jul 19, 2018		Soil	M18-Jl24306			X							
29	SB06_0.4-0.5	Jul 19, 2018		Soil	M18-Jl24307		X								
30	SB06_1.2-1.3	Jul 19, 2018		Soil	M18-Jl24308		X								
31	SB06_2.0-2.1	Jul 19, 2018		Soil	M18-Jl24309			X							
32	SB06_2.3-2.4	Jul 19, 2018		Soil	M18-Jl24310		X								
33	SB05_1.0-1.1	Jul 19, 2018		Soil	M18-Jl24311		X								

Company Name: Senversa Pty Ltd VIC
Address: Level 6, 15 Williams St
Melbourne
VIC 3000

Project Name: ARUP CONTAMINATION ASSESSMENT
Project ID: M16733

Order No.:
Report #: 608706
Phone: 9606 0070
Fax:

Received: Jul 20, 2018 12:35 PM
Due: Jul 27, 2018
Priority: 5 Day
Contact Name: Samuel O'Connor

Eurofins | mgt Analytical Services Manager : Natalie Krasselt

Sample Detail						CANCELLED	HOLD	HOLD	Polycyclic Aromatic Hydrocarbons	Metals IWRG 621 : Metals M12	Moisture Set	Moisture Set	Total Recoverable Hydrocarbons	Vic EPA IWRG 621 (Solids)	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X		X	X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794								X			X	X			X
Perth Laboratory - NATA Site # 23736															
34	SB05_2.5-2.6	Jul 19, 2018		Soil	M18-Jl24312		X								
35	SB05_2.6-2.7	Jul 19, 2018		Soil	M18-Jl24313			X							
36	SB04_0.5-0.6	Jul 19, 2018		Soil	M18-Jl24314		X								
37	SB04_2.2-2.3	Jul 19, 2018		Soil	M18-Jl24315		X								
38	SB03_1.1-1.2	Jul 19, 2018		Soil	M18-Jl24316		X								
39	SB02_0.6-0.7	Jul 19, 2018		Soil	M18-Jl24317		X								
40	SB02_1.3-1.4	Jul 19, 2018		Soil	M18-Jl24318		X								
41	SB02_1.8-1.9	Jul 19, 2018		Soil	M18-Jl24319		X								
42	SS03	Jul 19, 2018		Soil	M18-Jl24320		X								
43	RB01	Jul 19, 2018		Water	M18-Jl24321			X							
44	RB02	Jul 19, 2018		Water	M18-Jl24322		X								
45	SB4185	Jul 19, 2018		Soil	M18-Jl24323		X								

Company Name:	Senversa Pty Ltd VIC	**Order No.:**		**Received:**	Jul 20, 2018 12:35 PM
Address:	Level 6, 15 Williams St	**Report #:**	608706	**Due:**	Jul 27, 2018
	Melbourne	**Phone:**	9606 0070	**Priority:**	5 Day
	VIC 3000	**Fax:**		**Contact Name:**	Samuel O'Connor
Project Name:	ARUP CONTAMINATION ASSESSMENT				
Project ID:	M16733				

Eurofins | mgt Analytical Services Manager : Natalie Krasselt

Sample Detail						CANCELLED	HOLD	HOLD	Polycyclic Aromatic Hydrocarbons	Metals IWRG 621 : Metals M12	Moisture Set	Moisture Set	Total Recoverable Hydrocarbons	Vic EPA IWRG 621 (Solids)	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X		X	X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794								X			X	X			X
Perth Laboratory - NATA Site # 23736															
46	QA7	Jul 19, 2018		Soil	M18-Jl24324		X								
47	QA8	Jul 19, 2018		Soil	M18-Jl24325	X									
48	SB07_0.5-0.6	Jul 19, 2018		Soil	M18-Jl24326				X	X	X		X		
Test Counts						4	19	19	10	10	25	25	10	5	16

eurofins | mgt

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ug/L:** micrograms per litre
ppm: Parts per million	**ppb:** Parts per billion	**%:** Percentage
org/100mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

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

eurofins | mgt

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.2.4-Trichlorobenzene	mg/kg	< 0.5			0.5	Pass	
Hexachlorobutadiene	mg/kg	< 0.5			0.5	Pass	
1.1-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dibromoethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.4-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.3.5-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
2-Butanone (MEK)	mg/kg	< 0.5			0.5	Pass	
2-Propanone (Acetone)	mg/kg	< 0.5			0.5	Pass	
4-Chlorotoluene	mg/kg	< 0.5			0.5	Pass	
4-Methyl-2-pentanone (MIBK)	mg/kg	< 0.5			0.5	Pass	
Allyl chloride	mg/kg	< 0.5			0.5	Pass	
Benzene	mg/kg	< 0.1			0.1	Pass	
Bromobenzene	mg/kg	< 0.5			0.5	Pass	
Bromochloromethane	mg/kg	< 0.5			0.5	Pass	
Bromodichloromethane	mg/kg	< 0.5			0.5	Pass	
Bromoform	mg/kg	< 0.5			0.5	Pass	
Bromomethane	mg/kg	< 0.5			0.5	Pass	
Carbon disulfide	mg/kg	< 0.5			0.5	Pass	
Carbon Tetrachloride	mg/kg	< 0.5			0.5	Pass	
Chlorobenzene	mg/kg	< 0.5			0.5	Pass	
Chloroethane	mg/kg	< 0.5			0.5	Pass	
Chloroform	mg/kg	< 0.5			0.5	Pass	
Chloromethane	mg/kg	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
cis-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Dibromochloromethane	mg/kg	< 0.5			0.5	Pass	
Dibromomethane	mg/kg	< 0.5			0.5	Pass	
Dichlorodifluoromethane	mg/kg	< 0.5			0.5	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
Iodomethane	mg/kg	< 0.5			0.5	Pass	
Isopropyl benzene (Cumene)	mg/kg	< 0.5			0.5	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	

eurofins | mgt

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Methylene Chloride	mg/kg	< 0.5			0.5	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Styrene	mg/kg	< 0.5			0.5	Pass	
Tetrachloroethene	mg/kg	< 0.5			0.5	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
trans-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
trans-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Trichloroethene	mg/kg	< 0.5			0.5	Pass	
Trichlorofluoromethane	mg/kg	< 0.5			0.5	Pass	
Vinyl chloride	mg/kg	< 0.5			0.5	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	

eurofins | mgt

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1.0	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1.0	Pass	
Pentachlorophenol	mg/kg	< 1			1.0	Pass	
Tetrachlorophenols - Total	mg/kg	< 1			1.0	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
2-Nitrophenol	mg/kg	< 1			1.0	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
Method Blank							
Chromium (hexavalent)	mg/kg	< 1			1	Pass	
Cyanide (total)	mg/kg	< 5			5	Pass	
Fluoride	mg/kg	< 100			100	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Molybdenum	mg/kg	< 5			5	Pass	
Nickel	mg/kg	< 5			5	Pass	
Selenium	mg/kg	< 2			2	Pass	
Silver	mg/kg	< 0.2			0.2	Pass	
Tin	mg/kg	< 10			10	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	108			70-130	Pass	
TRH C10-C14	%	78			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	70			70-130	Pass	
1.1.1-Trichloroethane	%	80			70-130	Pass	
1.2-Dichlorobenzene	%	107			70-130	Pass	
1.2-Dichloroethane	%	101			70-130	Pass	
Benzene	%	103			70-130	Pass	
Ethylbenzene	%	92			70-130	Pass	
m&p-Xylenes	%	92			70-130	Pass	
Toluene	%	103			70-130	Pass	
Trichloroethene	%	96			70-130	Pass	
Xylenes - Total	%	92			70-130	Pass	
LCS - % Recovery							

eurofins | mgt

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	74			70-130	Pass	
TRH C6-C10	%	107			70-130	Pass	
TRH >C10-C16	%	79			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	110			70-130	Pass	
Acenaphthylene	%	90			70-130	Pass	
Anthracene	%	90			70-130	Pass	
Benz(a)anthracene	%	101			70-130	Pass	
Benzo(a)pyrene	%	85			70-130	Pass	
Benzo(b&j)fluoranthene	%	87			70-130	Pass	
Benzo(g.h.i)perylene	%	93			70-130	Pass	
Benzo(k)fluoranthene	%	88			70-130	Pass	
Chrysene	%	107			70-130	Pass	
Dibenz(a.h)anthracene	%	89			70-130	Pass	
Fluoranthene	%	125			70-130	Pass	
Fluorene	%	93			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	72			70-130	Pass	
Naphthalene	%	93			70-130	Pass	
Phenanthrene	%	96			70-130	Pass	
Pyrene	%	127			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	104			70-130	Pass	
4.4'-DDE	%	107			70-130	Pass	
4.4'-DDT	%	105			70-130	Pass	
a-BHC	%	112			70-130	Pass	
Aldrin	%	109			70-130	Pass	
b-BHC	%	106			70-130	Pass	
d-BHC	%	107			70-130	Pass	
Dieldrin	%	107			70-130	Pass	
Endosulfan I	%	104			70-130	Pass	
Endosulfan II	%	105			70-130	Pass	
Endosulfan sulphate	%	113			70-130	Pass	
Endrin	%	104			70-130	Pass	
Endrin aldehyde	%	117			70-130	Pass	
Endrin ketone	%	113			70-130	Pass	
g-BHC (Lindane)	%	109			70-130	Pass	
Heptachlor	%	104			70-130	Pass	
Heptachlor epoxide	%	107			70-130	Pass	
Hexachlorobenzene	%	113			70-130	Pass	
Methoxychlor	%	105			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	110			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	89			30-130	Pass	
2.4-Dichlorophenol	%	90			30-130	Pass	
2.4.5-Trichlorophenol	%	79			30-130	Pass	
2.4.6-Trichlorophenol	%	100			30-130	Pass	
2.6-Dichlorophenol	%	89			30-130	Pass	
4-Chloro-3-methylphenol	%	87			30-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Pentachlorophenol	%	68			30-130	Pass	
Tetrachlorophenols - Total	%	90			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	44			30-130	Pass	
2-Methyl-4.6-dinitrophenol	%	66			30-130	Pass	
2-Methylphenol (o-Cresol)	%	89			30-130	Pass	
2-Nitrophenol	%	86			30-130	Pass	
2.4-Dimethylphenol	%	87			30-130	Pass	
2.4-Dinitrophenol	%	38			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	91			30-130	Pass	
4-Nitrophenol	%	77			30-130	Pass	
Dinoseb	%	65			30-130	Pass	
Phenol	%	89			30-130	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	94			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	124			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	70			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	91			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	103			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	113			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	88			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	97			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	119			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	115			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	90			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	101			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	108			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	121			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	68			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	70			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	109			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	93			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	79			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	88			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	92			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	106			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	90			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	100			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	89			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	113			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	135			50-150	Pass	
LCS - % Recovery							
Chromium (hexavalent)	%	102			70-130	Pass	
Cyanide (total)	%	91			70-130	Pass	
Fluoride	%	109			70-130	Pass	

eurofins | mgt

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery									
Heavy Metals									
Arsenic			%	109			80-120	Pass	
Cadmium			%	108			80-120	Pass	
Chromium			%	117			80-120	Pass	
Copper			%	116			80-120	Pass	
Lead			%	117			80-120	Pass	
Mercury			%	89			75-125	Pass	
Molybdenum			%	113			80-120	Pass	
Nickel			%	114			80-120	Pass	
Selenium			%	104			80-120	Pass	
Silver			%	104			80-120	Pass	
Tin			%	118			80-120	Pass	
Zinc			%	112			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S18-Jl23095	NCP	%	98			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S18-Jl23095	NCP	%	98			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
1.1-Dichloroethene	M18-Jl26473	NCP	%	74			70-130	Pass	
1.1.1-Trichloroethane	M18-Jl23971	NCP	%	70			70-130	Pass	
1.2-Dichlorobenzene	M18-Jl23971	NCP	%	97			70-130	Pass	
1.2-Dichloroethane	M18-Jl23971	NCP	%	104			70-130	Pass	
Trichloroethene	M18-Jl23971	NCP	%	85			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	M18-Jl24379	NCP	%	129			70-130	Pass	
4.4'-DDE	M18-Jl24379	NCP	%	128			70-130	Pass	
4.4'-DDT	M18-Jl24379	NCP	%	125			70-130	Pass	
a-BHC	M18-Jl24379	NCP	%	128			70-130	Pass	
Aldrin	M18-Jl24379	NCP	%	129			70-130	Pass	
b-BHC	M18-Jl24379	NCP	%	119			70-130	Pass	
d-BHC	M18-Jl24379	NCP	%	121			70-130	Pass	
Dieldrin	M18-Jl24379	NCP	%	127			70-130	Pass	
Endosulfan I	M18-Jl24379	NCP	%	125			70-130	Pass	
Endosulfan II	M18-Jl24379	NCP	%	127			70-130	Pass	
Endosulfan sulphate	M18-Jl24379	NCP	%	124			70-130	Pass	
Endrin	M18-Jl24379	NCP	%	126			70-130	Pass	
Endrin aldehyde	M18-Jl24379	NCP	%	129			70-130	Pass	
Endrin ketone	M18-Jl24379	NCP	%	129			70-130	Pass	
g-BHC (Lindane)	M18-Jl24379	NCP	%	123			70-130	Pass	
Heptachlor	M18-Jl24379	NCP	%	125			70-130	Pass	
Heptachlor epoxide	M18-Jl24379	NCP	%	126			70-130	Pass	
Hexachlorobenzene	M18-Jl24379	NCP	%	125			70-130	Pass	
Methoxychlor	M18-Jl24379	NCP	%	122			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	M18-Jl23630	NCP	%	71			70-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2-Cyclohexyl-4.6-dinitrophenol	M18-Jl25109	NCP	%	38			30-130	Pass	
2.4-Dinitrophenol	M18-Jl25109	NCP	%	89			30-130	Pass	
Spike - % Recovery									
				Result 1					
Chromium (hexavalent)	M18-Jl25080	NCP	%	102			70-130	Pass	
Cyanide (total)	M18-Jl23630	NCP	%	34			70-130	Fail	Q08
Fluoride	M18-Jl24346	NCP	%	68			70-130	Fail	Q08
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M18-Jl24285	CP	%	92			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
Benzene	M18-Jl24285	CP	%	80			70-130	Pass	
Ethylbenzene	M18-Jl24285	CP	%	103			70-130	Pass	
m&p-Xylenes	M18-Jl24285	CP	%	95			70-130	Pass	
o-Xylene	M18-Jl24285	CP	%	101			70-130	Pass	
Toluene	M18-Jl24285	CP	%	90			70-130	Pass	
Xylenes - Total	M18-Jl24285	CP	%	97			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-Jl24285	CP	%	120			70-130	Pass	
TRH C6-C10	M18-Jl24285	CP	%	91			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Jl24288	CP	%	112			75-125	Pass	
Cadmium	M18-Jl24288	CP	%	102			75-125	Pass	
Chromium	M18-Jl24288	CP	%	116			75-125	Pass	
Copper	M18-Jl24288	CP	%	103			75-125	Pass	
Lead	M18-Jl24288	CP	%	101			75-125	Pass	
Mercury	M18-Jl24288	CP	%	85			70-130	Pass	
Molybdenum	M18-Jl24288	CP	%	112			75-125	Pass	
Nickel	M18-Jl24288	CP	%	106			75-125	Pass	
Selenium	M18-Jl24288	CP	%	102			75-125	Pass	
Silver	M18-Jl24288	CP	%	100			75-125	Pass	
Tin	M18-Jl24288	CP	%	114			75-125	Pass	
Zinc	M18-Jl24288	CP	%	120			75-125	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M18-Jl24295	CP	%	90			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Jl24295	CP	%	125			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Jl24295	CP	%	72			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Jl24295	CP	%	90			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M18-Jl24295	CP	%	103			50-150	Pass	
Perfluorononanoic acid (PFNA)	M18-Jl24295	CP	%	114			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M18-Jl24295	CP	%	93			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Jl24295	CP	%	95			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Jl24295	CP	%	116			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Jl24295	CP	%	116			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Jl24295	CP	%	103			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctane sulfonamide (FOSA)	M18-Jl24295	CP	%	101			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Jl24295	CP	%	107			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Jl24295	CP	%	86			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Jl24295	CP	%	67			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Jl24295	CP	%	74			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Jl24295	CP	%	99			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Jl24295	CP	%	87			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M18-Jl24295	CP	%	79			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Jl24295	CP	%	89			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Jl24295	CP	%	100			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Jl24295	CP	%	105			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Jl24295	CP	%	95			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Jl24295	CP	%	104			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Jl24295	CP	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Jl24295	CP	%	125			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Jl24295	CP	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Jl24295	CP	%	129			50-150	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-Jl24304	CP	%	93			70-130	Pass	
Acenaphthylene	M18-Jl24304	CP	%	73			70-130	Pass	
Anthracene	M18-Jl24304	CP	%	71			70-130	Pass	
Benz(a)anthracene	M18-Jl24304	CP	%	82			70-130	Pass	
Benzo(a)pyrene	M18-Jl24304	CP	%	73			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Jl24304	CP	%	82			70-130	Pass	
Benzo(g.h.i)perylene	M18-Jl24304	CP	%	81			70-130	Pass	
Benzo(k)fluoranthene	M18-Jl24304	CP	%	88			70-130	Pass	
Chrysene	M18-Jl24304	CP	%	90			70-130	Pass	
Dibenz(a.h)anthracene	M18-Jl24304	CP	%	79			70-130	Pass	
Fluoranthene	M18-Jl24304	CP	%	95			70-130	Pass	
Fluorene	M18-Jl24304	CP	%	77			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-Jl24304	CP	%	82			70-130	Pass	
Naphthalene	M18-Jl24304	CP	%	77			70-130	Pass	
Phenanthrene	M18-Jl24304	CP	%	82			70-130	Pass	
Pyrene	M18-Jl24304	CP	%	97			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	M18-Jl24304	CP	%	77			30-130	Pass	
2.4-Dichlorophenol	M18-Jl24304	CP	%	70			30-130	Pass	
2.4.5-Trichlorophenol	M18-Jl24304	CP	%	33			30-130	Pass	
2.4.6-Trichlorophenol	M18-Jl24304	CP	%	35			30-130	Pass	
2.6-Dichlorophenol	M18-Jl24304	CP	%	74			30-130	Pass	
4-Chloro-3-methylphenol	M18-Jl24304	CP	%	35			30-130	Pass	
Pentachlorophenol	M18-Jl24304	CP	%	36			30-130	Pass	
Tetrachlorophenols - Total	M18-Jl24304	CP	%	32			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Methylphenol (o-Cresol)	M18-Jl24304	CP	%	74			30-130	Pass	
2-Nitrophenol	M18-Jl24304	CP	%	42			30-130	Pass	
2.4-Dimethylphenol	M18-Jl24304	CP	%	70			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M18-Jl24304	CP	%	72			30-130	Pass	
4-Nitrophenol	M18-Jl24304	CP	%	45			30-130	Pass	
Phenol	M18-Jl24304	CP	%	72			30-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M18-Jl24172	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S18-Jl23094	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S18-Jl23094	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S18-Jl23094	NCP	mg/kg	< 50	55	63	30%	Fail	Q15
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-Jl24172	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M18-Jl24172	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S18-Jl23094	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S18-Jl23094	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S18-Jl23094	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4-Trichlorobenzene	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Hexachlorobutadiene	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1-Dichloroethene	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1-Trichloroethane	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2-Trichloroethane	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dibromoethane	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichlorobenzene	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloroethane	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloropropane	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.3-Trichloropropane	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4-Trimethylbenzene	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichlorobenzene	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichloropropane	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3.5-Trimethylbenzene	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.4-Dichlorobenzene	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Butanone (MEK)	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Propanone (Acetone)	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

eurofins | mgt

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
4-Chlorotoluene	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Allyl chloride	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzene	M18-Jl23970	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Bromobenzene	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromochloromethane	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromodichloromethane	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromoform	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromomethane	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon disulfide	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon Tetrachloride	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chlorobenzene	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroethane	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroform	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloromethane	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.2-Dichloroethene	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.3-Dichloropropene	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromochloromethane	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromomethane	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorodifluoromethane	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Ethylbenzene	M18-Jl23970	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Iodomethane	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Isopropyl benzene (Cumene)	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
m&p-Xylenes	M18-Jl23970	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methylene Chloride	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
o-Xylene	M18-Jl23970	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Styrene	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Tetrachloroethene	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Toluene	M18-Jl23970	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
trans-1.2-Dichloroethene	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.3-Dichloropropene	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichloroethene	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichlorofluoromethane	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Vinyl chloride	M18-Jl23970	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Xylenes - Total	M18-Jl23970	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M18-Jl24378	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M18-Jl24378	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M18-Jl24378	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M18-Jl24378	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M18-Jl24378	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M18-Jl24378	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M18-Jl24378	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M18-Jl24378	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M18-Jl24378	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M18-Jl24378	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M18-Jl24378	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M18-Jl24378	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M18-Jl24378	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M18-Jl24378	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M18-Jl24378	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M18-Jl24378	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M18-Jl24378	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Heptachlor epoxide	M18-Jl24378	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M18-Jl24378	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M18-Jl24378	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M18-Jl24378	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M18-Jl24378	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	M18-Jl24378	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	M18-Jl24378	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	M18-Jl24378	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	M18-Jl24378	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	M18-Jl24378	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	M18-Jl24378	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	M18-Jl24378	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M18-Jl24356	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	M18-Jl24356	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	M18-Jl24356	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	M18-Jl24356	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	M18-Jl24356	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	M18-Jl24356	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	M18-Jl24356	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	M18-Jl24356	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M18-Jl24356	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M18-Jl24356	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M18-Jl24356	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	M18-Jl24356	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	M18-Jl24356	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	M18-Jl24356	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M18-Jl24356	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	M18-Jl24356	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	M18-Jl24356	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	M18-Jl24356	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	M18-Jl23619	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Cyanide (total)	M18-Jl23619	NCP	mg/kg	8.9	< 5	140	30%	Fail	Q15
Fluoride	M18-Jl24341	NCP	mg/kg	190	210	11	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	M18-Jl24550	NCP	pH Units	5.9	5.8	pass	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M18-Jl24281	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M18-Jl24281	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M18-Jl24281	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M18-Jl24281	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M18-Jl24281	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Jl24281	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-Jl24281	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Jl24281	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M18-Jl24281	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

eurofins | mgt

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Dibenz(a.h)anthracene	M18-Jl24281	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M18-Jl24281	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M18-Jl24281	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Jl24281	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M18-Jl24281	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M18-Jl24281	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M18-Jl24281	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-Jl24282	CP	%	11	13	20	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Jl24285	CP	mg/kg	9.5	9.5	1.0	30%	Pass	
Cadmium	M18-Jl24285	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Jl24285	CP	mg/kg	26	24	6.0	30%	Pass	
Copper	M18-Jl24285	CP	mg/kg	16	15	11	30%	Pass	
Lead	M18-Jl24285	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Mercury	M18-Jl24285	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M18-Jl24285	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M18-Jl24285	CP	mg/kg	13	13	1.0	30%	Pass	
Selenium	M18-Jl24285	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M18-Jl24285	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M18-Jl24285	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M18-Jl24285	CP	mg/kg	59	56	4.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Jl24288	CP	mg/kg	16	16	<1	30%	Pass	
Cadmium	M18-Jl24288	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Jl24288	CP	mg/kg	37	37	2.0	30%	Pass	
Copper	M18-Jl24288	CP	mg/kg	20	20	1.0	30%	Pass	
Lead	M18-Jl24288	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Mercury	M18-Jl24288	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M18-Jl24288	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M18-Jl24288	CP	mg/kg	19	20	1.0	30%	Pass	
Selenium	M18-Jl24288	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M18-Jl24288	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M18-Jl24288	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M18-Jl24288	CP	mg/kg	67	68	2.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-Jl24291	CP	%	3.0	2.6	14	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorotridecanoic acid (PFTrDA)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Jl24294	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Jl24294	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Jl24294	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Jl24294	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Jl24294	CP	ug/kg	< 5	< 5	<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.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Natalie Krasselt	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Jonathon Angell	Senior Analyst-Organic (QLD)
Joseph Edouard	Senior Analyst-Organic (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Michael Brancati	Senior Analyst-Inorganic (VIC)
Steven Trout	Senior Analyst-Metal (QLD)

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

eurofins | mgt

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

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

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

Sample Receipt Advice

Company name:	**Senversa Pty Ltd VIC**
Contact name:	Samuel O'Connor
Project name:	ARUP CONTAMINATION ASSESSMENT
Project ID:	M16733
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Jul 27, 2018 2:27 PM
Eurofins | mgt reference:	**609847**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

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

Natalie Krasselt on Phone : +61 3 8564 5000 or by e.mail: NatalieKrasselt@eurofins.com

Results will be delivered electronically via e.mail to Samuel O'Connor - samuel.o'connor@senversa.com.au.

eurofins | mgt

30 years Testing For Life 1987–2017
Celebrating 30 years Testing and Protecting Human Health

Certificate of Analysis

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.

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

Attention: **Samuel O'Connor**

Report **609847-L**
Project name ARUP CONTAMINATION ASSESSMENT
Project ID M16733
Received Date Jul 27, 2018

Client Sample ID			**SB01_0.4-0.5**	**SB01_1.1-1.2**	**SB02_0.1-0.2**	**SB04_0.1-0.2**
Sample Matrix			**AUS Leachate - pH 5.0**	**AUS Leachate - pH 5.0**	**AUS Leachate - pH 5.0**	**AUS Leachate - pH 5.0**
Eurofins | mgt Sample No.			**M18-Jl33784**	**M18-Jl33785**	**M18-Jl33786**	**M18-Jl33787**
Date Sampled			**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**	**Jul 19, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)N11	0.05	ug/L	< 0.05	< 0.05	-	< 0.05
Perfluoropentanoic acid (PFPeA)N11	0.01	ug/L	< 0.01	< 0.01	-	< 0.01
Perfluorohexanoic acid (PFHxA)N11	0.01	ug/L	< 0.01	< 0.01	-	< 0.01
Perfluoroheptanoic acid (PFHpA)N11	0.01	ug/L	< 0.01	< 0.01	-	< 0.01
Perfluorooctanoic acid (PFOA)N11	0.01	ug/L	< 0.01	< 0.01	-	< 0.01
Perfluorononanoic acid (PFNA)N11	0.01	ug/L	< 0.01	< 0.01	-	< 0.01
Perfluorodecanoic acid (PFDA)N11	0.01	ug/L	< 0.01	< 0.01	-	< 0.01
Perfluoroundecanoic acid (PFUnDA)N11	0.01	ug/L	< 0.01	< 0.01	-	< 0.01
Perfluorododecanoic acid (PFDoDA)N11	0.01	ug/L	< 0.01	< 0.01	-	< 0.01
Perfluorotridecanoic acid (PFTrDA)N15	0.01	ug/L	< 0.01	< 0.01	-	< 0.01
Perfluorotetradecanoic acid (PFTeDA)N11	0.01	ug/L	< 0.01	< 0.01	-	< 0.01
13C4-PFBA (surr.)	1	%	95	98	-	94
13C5-PFPeA (surr.)	1	%	83	81	-	77
13C5-PFHxA (surr.)	1	%	61	63	-	64
13C4-PFHpA (surr.)	1	%	126	125	-	129
13C8-PFOA (surr.)	1	%	134	133	-	134
13C5-PFNA (surr.)	1	%	134	135	-	131
13C6-PFDA (surr.)	1	%	129	115	-	120
13C2-PFUnDA (surr.)	1	%	99	93	-	87
13C2-PFDoDA (surr.)	1	%	100	91	-	78
13C2-PFTeDA (surr.)	1	%	67	34	-	45
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)N11	0.05	ug/L	< 0.05	< 0.05	-	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)N11	0.05	ug/L	< 0.05	< 0.05	-	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)N11	0.05	ug/L	< 0.05	< 0.05	-	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)N11	0.05	ug/L	< 0.05	< 0.05	-	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)N11	0.05	ug/L	< 0.05	< 0.05	-	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)N11	0.05	ug/L	< 0.05	< 0.05	-	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)N11	0.05	ug/L	< 0.05	< 0.05	-	< 0.05
13C8-FOSA (surr.)	1	%	68	63	-	53
D3-N-MeFOSA (surr.)	1	%	INT	INT	-	INT

eurofins | mgt

Client Sample ID			SB01_0.4-0.5	SB01_1.1-1.2	SB02_0.1-0.2	SB04_0.1-0.2
Sample Matrix			AUS Leachate - pH 5.0	AUS Leachate - pH 5.0	AUS Leachate - pH 5.0	AUS Leachate - pH 5.0
Eurofins | mgt Sample No.			M18-JI33784	M18-JI33785	M18-JI33786	M18-JI33787
Date Sampled			Jul 19, 2018	Jul 19, 2018	Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D5-N-EtFOSA (surr.)	1	%	INT	11	-	INT
D7-N-MeFOSE (surr.)	1	%	36	31	-	22
D9-N-EtFOSE (surr.)	1	%	38	29	-	23
D5-N-EtFOSAA (surr.)	1	%	19	22	-	INT
D3-N-MeFOSAA (surr.)	1	%	17	22	-	INT
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	-	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	-	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	-	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	-	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.02	< 0.01	-	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	-	< 0.01
13C3-PFBS (surr.)	1	%	104	102	-	107
18O2-PFHxS (surr.)	1	%	112	112	-	116
13C8-PFOS (surr.)	1	%	97	100	-	96
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	-	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	-	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	-	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	0.01	ug/L	< 0.01	< 0.01	-	< 0.01
13C2-4:2 FTSA (surr.)	1	%	119	116	-	119
13C2-6:2 FTSA (surr.)	1	%	133	138	-	137
13C2-8:2 FTSA (surr.)	1	%	153	148	-	139
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.02	< 0.01	-	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.02	< 0.01	-	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.02	< 0.01	-	< 0.01
Sum of WA DER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	-	< 0.05
Sum of PFASs (n=28)*	0.1	ug/L	< 0.1	< 0.1	-	< 0.1
Heavy Metals						
Arsenic	0.01	mg/L	< 0.01	-	-	< 0.01
Nickel	0.01	mg/L	-	-	0.04	-
AUS Leaching Procedure						
Leachate Fluid[C01]		comment	1.0	1.0	1.0	1.0
pH (Leachate fluid)	0.1	pH Units	5.1	5.1	5.1	5.1
pH (off)	0.1	pH Units	5.6	5.8	5.3	5.2

Client Sample ID			SB04_1.0-1.1	SS02
Sample Matrix			AUS Leachate - pH 5.0	AUS Leachate - pH 5.0
Eurofins | mgt Sample No.			M18-Jl33788	M18-Jl33789
Date Sampled			Jul 19, 2018	Jul 19, 2018
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)N11	0.05	ug/L	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)N11	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)N11	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)N11	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)N11	0.01	ug/L	< 0.01	0.01
Perfluorononanoic acid (PFNA)N11	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)N11	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)N11	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)N11	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)N15	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)N11	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	96	73
13C5-PFPeA (surr.)	1	%	77	62
13C5-PFHxA (surr.)	1	%	63	51
13C4-PFHpA (surr.)	1	%	129	101
13C8-PFOA (surr.)	1	%	127	102
13C5-PFNA (surr.)	1	%	124	100
13C6-PFDA (surr.)	1	%	111	90
13C2-PFUnDA (surr.)	1	%	78	58
13C2-PFDoDA (surr.)	1	%	70	47
13C2-PFTeDA (surr.)	1	%	43	25
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)N11	0.05	ug/L	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)N11	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)N11	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)N11	0.05	ug/L	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)N11	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)N11	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)N11	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	72	33
D3-N-MeFOSA (surr.)	1	%	INT	INT
D5-N-EtFOSA (surr.)	1	%	INT	INT
D7-N-MeFOSE (surr.)	1	%	36	INT
D9-N-EtFOSE (surr.)	1	%	35	INT
D5-N-EtFOSAA (surr.)	1	%	21	18
D3-N-MeFOSAA (surr.)	1	%	INT	16
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)N11	0.01	ug/L	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)N15	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)N11	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)N15	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)N11	0.01	ug/L	< 0.01	N09 0.05
Perfluorodecanesulfonic acid (PFDS)N15	0.01	ug/L	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	104	98
18O2-PFHxS (surr.)	1	%	116	103
13C8-PFOS (surr.)	1	%	98	89

eurofins | mgt

Client Sample ID			SB04_1.0-1.1	SS02
Sample Matrix			**AUS Leachate - pH 5.0**	**AUS Leachate - pH 5.0**
Eurofins | mgt Sample No.			**M18-JI33788**	**M18-JI33789**
Date Sampled			**Jul 19, 2018**	**Jul 19, 2018**
Test/Reference	LOR	Unit		
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	120	90
13C2-6:2 FTSA (surr.)	1	%	137	112
13C2-8:2 FTSA (surr.)	1	%	134	105
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	0.05
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	0.06
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	0.06
Sum of WA DER PFAS (n=10)*	0.05	ug/L	< 0.05	0.06
Sum of PFASs (n=28)*	0.1	ug/L	< 0.1	< 0.1
Heavy Metals				
Arsenic	0.01	mg/L	< 0.01	-
Zinc	0.01	mg/L	-	0.71
AUS Leaching Procedure				
Leachate Fluid[C01]		comment	1.0	1.0
pH (Leachate fluid)	0.1	pH Units	5.1	5.1
pH (off)	0.1	pH Units	6.8	5.2

eurofins | mgt

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Jul 31, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Jul 31, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Jul 31, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Jul 31, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Heavy Metals	Melbourne	Jul 30, 2018	180 Day
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
AUS Leaching Procedure	Brisbane	Jul 31, 2018	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			

Company Name:	Senversa Pty Ltd VIC	**Order No.:**		**Received:**	Jul 27, 2018 2:27 PM
Address:	Level 6, 15 Williams St Melbourne VIC 3000	**Report #:**	609847	**Due:**	Aug 3, 2018
		Phone:	9606 0070	**Priority:**	5 Day
		Fax:		**Contact Name:**	Samuel O'Connor
Project Name:	ARUP CONTAMINATION ASSESSMENT				
Project ID:	M16733				

Eurofins | mgt Analytical Services Manager : Natalie Krasselt

Sample Detail						Arsenic	Nickel	Zinc	AUS Leaching Procedure	AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X		
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794										X	X
Perth Laboratory - NATA Site # 23736											
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	SB01_0.4-0.5	Jul 19, 2018		AUS Leachate - pH 5.0	M18-Jl33784	X			X		X
2	SB01_1.1-1.2	Jul 19, 2018		AUS Leachate - pH 5.0	M18-Jl33785					X	X
3	SB02_0.1-0.2	Jul 19, 2018		AUS Leachate - pH 5.0	M18-Jl33786		X		X		
4	SB04_0.1-0.2	Jul 19, 2018		AUS Leachate - pH 5.0	M18-Jl33787	X			X		X
5	SB04_1.0-1.1	Jul 19, 2018		AUS Leachate - pH 5.0	M18-Jl33788	X			X		X
6	SS02	Jul 19, 2018		AUS Leachate	M18-Jl33789			X	X		X

Company Name:	Senversa Pty Ltd VIC	**Order No.:**		**Received:**	Jul 27, 2018 2:27 PM
Address:	Level 6, 15 Williams St Melbourne VIC 3000	**Report #:**	609847	**Due:**	Aug 3, 2018
		Phone:	9606 0070	**Priority:**	5 Day
		Fax:		**Contact Name:**	Samuel O'Connor
Project Name:	ARUP CONTAMINATION ASSESSMENT				
Project ID:	M16733				

Eurofins | mgt Analytical Services Manager : Natalie Krasselt

Sample Detail	Arsenic	Nickel	Zinc	AUS Leaching Procedure	AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271	X	X	X	X		
Sydney Laboratory - NATA Site # 18217						
Brisbane Laboratory - NATA Site # 20794					X	X
Perth Laboratory - NATA Site # 23736						
- pH 5.0						
Test Counts	3	1	1	6	6	5

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ug/L:** micrograms per litre
ppm: Parts per million	**ppb:** Parts per billion	**%:** Percentage
org/100mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.01			0.01	Pass	
Nickel	mg/L	< 0.01			0.01	Pass	
Zinc	mg/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Jl33789	CP	%	106			75-125	Pass	
Nickel	M18-Jl33789	CP	%	106			75-125	Pass	
Zinc	M18-Jl33789	CP	%	120			75-125	Pass	

eurofins | mgt

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M18-Jl31614	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Jl31614	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Jl31614	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Jl31614	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M18-Jl31614	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M18-Jl31614	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M18-Jl31614	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Jl31614	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Jl31614	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Jl31614	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Jl31614	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M18-Jl31614	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Jl31614	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Jl31614	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Jl31614	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Jl31614	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Jl31614	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Jl31614	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M18-Jl31614	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Jl31614	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Jl31614	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Jl31614	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Jl31614	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Jl31614	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Jl31614	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Jl31614	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Jl31614	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Jl31614	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

eurofins | mgt

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Jl33789	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Nickel	M18-Jl33789	CP	mg/L	0.02	0.02	5.0	30%	Pass	
Zinc	M18-Jl33789	CP	mg/L	0.71	0.69	2.0	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised By

Natalie Krasselt	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Jonathon Angell	Senior Analyst-Organic (QLD)

Glenn Jackson
National Operations 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.

CERTIFICATE OF ANALYSIS

Work Order	: **EM1811718**	Page	: 1 of 10
Client	: **SENVERSA PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM O'CONNOR	Contact	: Larissa Burns
Address	: Level 6, 15 William St Melbourne VICTORIA, AUSTRALIA 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: M16733	Date Samples Received	: 24-Jul-2018 08:50
Order number	:	Date Analysis Commenced	: 24-Jul-2018
C-O-C number	: ----	Issue Date	: 30-Jul-2018 12:58
Sampler	: SAM O'CONNOR		
Site	: ----		
Quote number	: EN/333/17 (secondary work only)		
No. of samples received	: 4		
No. of samples analysed	: 3		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Andrew Lu	VOC Section Supervisor	Melbourne Organics, Springvale, VIC
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Franco Lentini		Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

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

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QA2	QA4	QA6	----	----
			Client sampling date / time	19-Jul-2018 00:00	19-Jul-2018 00:00	19-Jul-2018 00:00	----	----
Compound	CAS Number	LOR	Unit	EM1811718-001	EM1811718-002	EM1811718-003	--------	--------
				Result	Result	Result	----	----
EA001: pH in soil using 0.01M CaCl extract								
pH (CaCl2)	----	0.1	pH Unit	----	----	**7.6**	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**8.4**	**11.4**	----	----	----
Moisture Content	----	1.0	%	----	----	**1.8**	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	----	**20**	----	----
Cadmium	7440-43-9	1	mg/kg	----	----	<1	----	----
Copper	7440-50-8	5	mg/kg	----	----	**16**	----	----
Lead	7439-92-1	5	mg/kg	----	----	<5	----	----
Molybdenum	7439-98-7	2	mg/kg	----	----	<2	----	----
Nickel	7440-02-0	2	mg/kg	----	----	**16**	----	----
Selenium	7782-49-2	5	mg/kg	----	----	<5	----	----
Silver	7440-22-4	2	mg/kg	----	----	<2	----	----
Tin	7440-31-5	5	mg/kg	----	----	<5	----	----
Zinc	7440-66-6	5	mg/kg	----	----	**47**	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	----	<0.1	----	----
EG048: Hexavalent Chromium (Alkaline Digest)								
Hexavalent Chromium	18540-29-9	0.5	mg/kg	----	----	<0.5	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	1	mg/kg	----	----	<1	----	----
EK040T: Fluoride Total								
Fluoride	16984-48-8	40	mg/kg	----	----	**620**	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	----	<0.1	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
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	----	----
Styrene	100-42-5	0.5	mg/kg	----	----	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	----	----	<0.5	----	----
^ Sum of monocyclic aromatic hydrocarbons	----	0.2	mg/kg	----	----	<0.2	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QA2	QA4	QA6	----	----
			Client sampling date / time	19-Jul-2018 00:00	19-Jul-2018 00:00	19-Jul-2018 00:00	----	----
Compound	CAS Number	LOR	Unit	EM1811718-001	EM1811718-002	EM1811718-003	--------	--------
				Result	Result	Result	----	----
EP074A: Monocyclic Aromatic Hydrocarbons - Continued								
^ Total Xylenes	----	0.5	mg/kg	----	----	<0.5	----	----
EP074H: Naphthalene								
Naphthalene	91-20-3	1	mg/kg	----	----	<1	----	----
EP074I: Volatile Halogenated Compounds								
Vinyl chloride	75-01-4	0.02	mg/kg	----	----	<0.02	----	----
1.1-Dichloroethene	75-35-4	0.01	mg/kg	----	----	<0.01	----	----
Methylene chloride	75-09-2	0.4	mg/kg	----	----	<0.4	----	----
trans-1.2-Dichloroethene	156-60-5	0.02	mg/kg	----	----	<0.02	----	----
cis-1.2-Dichloroethene	156-59-2	0.01	mg/kg	----	----	<0.01	----	----
Chloroform	67-66-3	0.02	mg/kg	----	----	<0.02	----	----
1.1.1-Trichloroethane	71-55-6	0.01	mg/kg	----	----	<0.01	----	----
Carbon Tetrachloride	56-23-5	0.01	mg/kg	----	----	<0.01	----	----
1.2-Dichloroethane	107-06-2	0.02	mg/kg	----	----	<0.02	----	----
Trichloroethene	79-01-6	0.02	mg/kg	----	----	<0.02	----	----
1.1.2-Trichloroethane	79-00-5	0.04	mg/kg	----	----	<0.04	----	----
Tetrachloroethene	127-18-4	0.02	mg/kg	----	----	<0.02	----	----
1.1.1.2-Tetrachloroethane	630-20-6	0.01	mg/kg	----	----	<0.01	----	----
1.1.2.2-Tetrachloroethane	79-34-5	0.02	mg/kg	----	----	<0.02	----	----
Hexachlorobutadiene	87-68-3	0.02	mg/kg	----	----	<0.02	----	----
Chlorobenzene	108-90-7	0.02	mg/kg	----	----	<0.02	----	----
1.4-Dichlorobenzene	106-46-7	0.02	mg/kg	----	----	<0.02	----	----
1.2-Dichlorobenzene	95-50-1	0.02	mg/kg	----	----	<0.02	----	----
1.2.4-Trichlorobenzene	120-82-1	0.01	mg/kg	----	----	<0.01	----	----
^ Sum of volatile chlorinated hydrocarbons	----	0.01	mg/kg	----	----	<0.01	----	----
^ Sum of other chlorinated hydrocarbons	----	0.01	mg/kg	----	----	<0.01	----	----
EP075A: Phenolic Compounds (Halogenated)								
2-Chlorophenol	95-57-8	0.03	mg/kg	----	----	<0.03	----	----
2.4-Dichlorophenol	120-83-2	0.03	mg/kg	----	----	<0.03	----	----
2.6-Dichlorophenol	87-65-0	0.03	mg/kg	----	----	<0.03	----	----
4-Chloro-3-methylphenol	59-50-7	0.03	mg/kg	----	----	<0.03	----	----
2.4.5-Trichlorophenol	95-95-4	0.05	mg/kg	----	----	<0.05	----	----
2.4.6-Trichlorophenol	88-06-2	0.05	mg/kg	----	----	<0.05	----	----
2.3.5.6-Tetrachlorophenol	935-95-5	0.03	mg/kg	----	----	<0.03	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QA2	QA4	QA6	----	----
			Client sampling date / time	19-Jul-2018 00:00	19-Jul-2018 00:00	19-Jul-2018 00:00	----	----
Compound	CAS Number	LOR	Unit	EM1811718-001	EM1811718-002	EM1811718-003	--------	--------
				Result	Result	Result	----	----
EP075A: Phenolic Compounds (Halogenated) - Continued								
2.3.4.5 & 2.3.4.6-Tetrachlorophenol	4901-51-3/58-90-2	0.05	mg/kg	----	----	<0.05	----	----
Pentachlorophenol	87-86-5	0.2	mg/kg	----	----	<0.2	----	----
^ Sum of Phenols (halogenated)	----	0.03	mg/kg	----	----	<0.03	----	----
EP075A: Phenolic Compounds (Non-halogenated)								
Phenol	108-95-2	1	mg/kg	----	----	<1	----	----
2-Methylphenol	95-48-7	1	mg/kg	----	----	<1	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	----	----	<1	----	----
2-Nitrophenol	88-75-5	1	mg/kg	----	----	<1	----	----
2.4-Dimethylphenol	105-67-9	1	mg/kg	----	----	<1	----	----
2.4-Dinitrophenol	51-28-5	5	mg/kg	----	----	<5	----	----
4-Nitrophenol	100-02-7	5	mg/kg	----	----	<5	----	----
2-Methyl-4.6-dinitrophenol	8071-51-0	5	mg/kg	----	----	<5	----	----
Dinoseb	88-85-7	5	mg/kg	----	----	<5	----	----
2-Cyclohexyl-4.6-Dinitrophenol	131-89-5	5	mg/kg	----	----	<5	----	----
^ Sum of Phenols (non-halogenated)	----	1	mg/kg	----	----	<1	----	----
EP075B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg	----	----	<0.5	----	----
Acenaphthylene	208-96-8	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) & Benzo(k)fluoranthene	205-99-2 207-08-9	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	QA2	QA4	QA6	----	----
			Client sampling date / time	19-Jul-2018 00:00	19-Jul-2018 00:00	19-Jul-2018 00:00	----	----
Compound	CAS Number	LOR	Unit	EM1811718-001	EM1811718-002	EM1811718-003	--------	--------
				Result	Result	Result	----	----
EP075B: Polynuclear Aromatic Hydrocarbons - Continued								
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	----	**0.6**	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	----	**1.2**	----	----
EP075I: Organochlorine Pesticides								
alpha-BHC	319-84-6	0.03	mg/kg	----	----	<0.03	----	----
Hexachlorobenzene (HCB)	118-74-1	0.03	mg/kg	----	----	<0.03	----	----
beta-BHC	319-85-7	0.03	mg/kg	----	----	<0.03	----	----
gamma-BHC	58-89-9	0.03	mg/kg	----	----	<0.03	----	----
delta-BHC	319-86-8	0.03	mg/kg	----	----	<0.03	----	----
Heptachlor	76-44-8	0.03	mg/kg	----	----	<0.03	----	----
Aldrin	309-00-2	0.03	mg/kg	----	----	<0.03	----	----
Heptachlor epoxide	1024-57-3	0.03	mg/kg	----	----	<0.03	----	----
cis-Chlordane	5103-71-9	0.03	mg/kg	----	----	<0.03	----	----
trans-Chlordane	5103-74-2	0.03	mg/kg	----	----	<0.03	----	----
Endosulfan 1	959-98-8	0.03	mg/kg	----	----	<0.03	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	----	----	<0.05	----	----
Dieldrin	60-57-1	0.03	mg/kg	----	----	<0.03	----	----
Endrin aldehyde	7421-93-4	0.03	mg/kg	----	----	<0.03	----	----
Endrin	72-20-8	0.03	mg/kg	----	----	<0.03	----	----
Endosulfan 2	33213-65-9	0.03	mg/kg	----	----	<0.03	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	----	----	<0.05	----	----
Endosulfan sulfate	1031-07-8	0.03	mg/kg	----	----	<0.03	----	----
4.4`-DDT	50-29-3	0.05	mg/kg	----	----	<0.05	----	----
Methoxychlor	72-43-5	0.03	mg/kg	----	----	<0.03	----	----
^ Sum of organochlorine pesticides	----	0.03	mg/kg	----	----	<0.03	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.03	mg/kg	----	----	<0.03	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	----	----	<0.05	----	----
^ Chlordane	57-74-9	0.03	mg/kg	----	----	<0.03	----	----
^ Sum of other organochlorine pesticides	----	0.03	mg/kg	----	----	<0.03	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	----	----	<10	----	----
C10 - C14 Fraction	----	50	mg/kg	----	----	<50	----	----
C6 - C10 Fraction	C6_C10	10	mg/kg	----	----	<10	----	----
C15 - C28 Fraction	----	100	mg/kg	----	----	<100	----	----
C29 - C36 Fraction	----	100	mg/kg	----	----	<100	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QA2	QA4	QA6	----	----
			Client sampling date / time	19-Jul-2018 00:00	19-Jul-2018 00:00	19-Jul-2018 00:00	----	----
Compound	CAS Number	LOR	Unit	EM1811718-001	EM1811718-002	EM1811718-003	--------	--------
				Result	Result	Result	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued								
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	----	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
>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	----	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	----	<10	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0003**	**0.0005**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QA2	QA4	QA6	----	----
			Client sampling date / time	19-Jul-2018 00:00	19-Jul-2018 00:00	19-Jul-2018 00:00	----	----
Compound	CAS Number	LOR	Unit	EM1811718-001	EM1811718-002	EM1811718-003	--------	--------
				Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued								
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	**0.0003**	**0.0005**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	**0.0003**	**0.0005**	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	**0.0003**	**0.0005**	----	----	----
EP066S: PCB Surrogate								

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL)**

Compound	CAS Number	LOR	Unit	QA2	QA4	QA6	----	----
Client sampling date / time				19-Jul-2018 00:00	19-Jul-2018 00:00	19-Jul-2018 00:00	----	----
				EM1811718-001	EM1811718-002	EM1811718-003	--------	--------
				Result	Result	Result	----	----
EP066S: PCB Surrogate - Continued								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	70.2	----	----
EP074S: VOC Surrogates (Ultra-Trace)								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	----	----	82.3	----	----
Toluene-D8	2037-26-5	0.1	%	----	----	72.3	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	----	----	78.8	----	----
EP075S: Acid Extractable Surrogates (Waste Classification)								
Phenol-d6	13127-88-3	0.025	%	----	----	129	----	----
2-Chlorophenol-D4	93951-73-6	0.025	%	----	----	74.8	----	----
2.4.6-Tribromophenol	118-79-6	0.025	%	----	----	83.6	----	----
EP075T: Base/Neutral Extractable Surrogates (Waste Classification)								
Nitrobenzene-D5	4165-60-0	0.025	%	----	----	105	----	----
1.2-Dichlorobenzene-D4	2199-69-1	0.025	%	----	----	96.2	----	----
2-Fluorobiphenyl	321-60-8	0.025	%	----	----	93.0	----	----
Anthracene-d10	1719-06-8	0.025	%	----	----	108	----	----
4-Terphenyl-d14	1718-51-0	0.025	%	----	----	110	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	63.0	63.0	----	----	----
13C8-PFOA	----	0.0002	%	77.5	64.5	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	41	122
EP074S: VOC Surrogates (Ultra-Trace)			
1.2-Dichloroethane-D4	17060-07-0	59	119
Toluene-D8	2037-26-5	55	117
4-Bromofluorobenzene	460-00-4	59	123
EP075S: Acid Extractable Surrogates (Waste Classification)			
Phenol-d6	13127-88-3	28	134
2-Chlorophenol-D4	93951-73-6	27	123
2.4.6-Tribromophenol	118-79-6	25	149
EP075T: Base/Neutral Extractable Surrogates (Waste Classification)			
Nitrobenzene-D5	4165-60-0	29	125
1.2-Dichlorobenzene-D4	2199-69-1	31	117
2-Fluorobiphenyl	321-60-8	44	136
Anthracene-d10	1719-06-8	53	133
4-Terphenyl-d14	1718-51-0	59	141
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	130
13C8-PFOA	----	60	130

QUALITY CONTROL REPORT

Work Order	: **EM1811718**	Page	: 1 of 14
Client	: **SENVERSA PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM O'CONNOR	Contact	: Larissa Burns
Address	: Level 6, 15 William St Melbourne VICTORIA, AUSTRALIA 3000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: M16733	Date Samples Received	: 24-Jul-2018
Order number	:	Date Analysis Commenced	: 24-Jul-2018
C-O-C number	: ----	Issue Date	: 30-Jul-2018
Sampler	: SAM O'CONNOR		
Site	: ----		
Quote number	: EN/333/17 (secondary work only)		
No. of samples received	: 4		
No. of samples analysed	: 3		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Andrew Lu	VOC Section Supervisor	Melbourne Organics, Springvale, VIC
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Franco Lentini		Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA001: pH in soil using 0.01M CaCl extract (QC Lot: 1826666)									
EM1811636-005	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	6.9	6.9	0.00	0% - 20%
EM1811720-006	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	7.6	7.6	0.00	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1824303)									
EM1811657-002	Anonymous	EA055: Moisture Content	----	0.1	%	25.6	24.8	3.29	0% - 20%
EM1811724-002	Anonymous	EA055: Moisture Content	----	0.1	%	15.9	16.2	1.86	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1828434)									
EB1817717-054	Anonymous	EA055: Moisture Content	----	0.1	%	56.1	56.5	0.625	0% - 20%
EP1808535-002	Anonymous	EA055: Moisture Content	----	0.1	%	8.6	8.1	5.55	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1824592)									
EM1811557-047	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	4	0.00	No Limit
		EG005T: Silver	7440-22-4	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	10	10	0.00	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Tin	7440-31-5	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.00	No Limit
EM1811718-003	QA6	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	16	16	0.00	No Limit
		EG005T: Silver	7440-22-4	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	20	20	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005T: Total Metals by ICP-AES (QC Lot: 1824592) - continued									
EM1811718-003	QA6	EG005T: Copper	7440-50-8	5	mg/kg	16	18	12.7	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Tin	7440-31-5	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	47	45	4.30	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1824593)									
EM1811557-047	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1811718-003	QA6	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EG048: Hexavalent Chromium (Alkaline Digest) (QC Lot: 1826703)									
EM1811718-003	QA6	EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EM1811767-007	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 1824383)									
EM1811710-001	Anonymous	EK026SF: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.00	No Limit
EM1811659-005	Anonymous	EK026SF: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.00	No Limit
EK040T: Fluoride Total (QC Lot: 1824280)									
EM1811706-001	Anonymous	EK040T: Fluoride	16984-48-8	40	mg/kg	350	350	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 1826685)									
EM1811500-001	Anonymous	EP066-EM: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 1824543)									
EM1811636-006	Anonymous	EP074-UT: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP074-UT: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074-UT: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074-UT: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074-UT: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074-UT: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074H: Naphthalene (QC Lot: 1824543)									
EM1811636-006	Anonymous	EP074-UT: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EP074I: Volatile Halogenated Compounds (QC Lot: 1824543)									
EM1811636-006	Anonymous	EP074-UT: 1.1-Dichloroethene	75-35-4	0.01	mg/kg	<0.01	<0.01	0.00	No Limit
		EP074-UT: cis-1.2-Dichloroethene	156-59-2	0.01	mg/kg	<0.01	<0.01	0.00	No Limit
		EP074-UT: 1.1.1-Trichloroethane	71-55-6	0.01	mg/kg	<0.01	<0.01	0.00	No Limit
		EP074-UT: Carbon Tetrachloride	56-23-5	0.01	mg/kg	<0.01	<0.01	0.00	No Limit
		EP074-UT: 1.1.1.2-Tetrachloroethane	630-20-6	0.01	mg/kg	<0.01	<0.01	0.00	No Limit
		EP074-UT: 1.2.4-Trichlorobenzene	120-82-1	0.01	mg/kg	<0.01	<0.01	0.00	No Limit
		EP074-UT: Vinyl chloride	75-01-4	0.02	mg/kg	<0.02	<0.02	0.00	No Limit
		EP074-UT: trans-1.2-Dichloroethene	156-60-5	0.02	mg/kg	<0.02	<0.02	0.00	No Limit
		EP074-UT: Chloroform	67-66-3	0.02	mg/kg	<0.02	<0.02	0.00	No Limit
		EP074-UT: 1.2-Dichloroethane	107-06-2	0.02	mg/kg	<0.02	<0.02	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP074I: Volatile Halogenated Compounds (QC Lot: 1824543) - continued									
EM1811636-006	Anonymous	EP074-UT: Trichloroethene	79-01-6	0.02	mg/kg	<0.02	<0.02	0.00	No Limit
		EP074-UT: Tetrachloroethene	127-18-4	0.02	mg/kg	<0.02	<0.02	0.00	No Limit
		EP074-UT: 1.1.2.2-Tetrachloroethane	79-34-5	0.02	mg/kg	<0.02	<0.02	0.00	No Limit
		EP074-UT: Hexachlorobutadiene	87-68-3	0.02	mg/kg	<0.02	<0.02	0.00	No Limit
		EP074-UT: Chlorobenzene	108-90-7	0.02	mg/kg	<0.02	<0.02	0.00	No Limit
		EP074-UT: 1.4-Dichlorobenzene	106-46-7	0.02	mg/kg	<0.02	<0.02	0.00	No Limit
		EP074-UT: 1.2-Dichlorobenzene	95-50-1	0.02	mg/kg	<0.02	<0.02	0.00	No Limit
		EP074-UT: 1.1.2-Trichloroethane	79-00-5	0.04	mg/kg	<0.04	<0.04	0.00	No Limit
		EP074-UT: Methylene chloride	75-09-2	0.4	mg/kg	<0.4	<0.4	0.00	No Limit
EP075A: Phenolic Compounds (Halogenated) (QC Lot: 1826686)									
EM1811500-001	Anonymous	EP075-EM: 2-Chlorophenol	95-57-8	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: 2.4-Dichlorophenol	120-83-2	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: 2.6-Dichlorophenol	87-65-0	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: 4-Chloro-3-methylphenol	59-50-7	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: 2.3.5.6-Tetrachlorophenol	935-95-5	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: 2.4.5-Trichlorophenol	95-95-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP075-EM: 2.4.6-Trichlorophenol	88-06-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP075-EM: 2.3.4.5 & 2.3.4.6-Tetrachlorophenol	4901-51-3/58-90-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP075-EM: Pentachlorophenol	87-86-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP075A: Phenolic Compounds (Non-halogenated) (QC Lot: 1826686)									
EM1811500-001	Anonymous	EP075-EM: Phenol	108-95-2	1	mg/kg	<1	<1	0.00	No Limit
		EP075-EM: 2-Methylphenol	95-48-7	1	mg/kg	<1	<1	0.00	No Limit
		EP075-EM: 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075-EM: 2-Nitrophenol	88-75-5	1	mg/kg	<1	<1	0.00	No Limit
		EP075-EM: 2.4-Dimethylphenol	105-67-9	1	mg/kg	<1	<1	0.00	No Limit
		EP075-EM: 2.4-Dinitrophenol	51-28-5	5	mg/kg	<5	<5	0.00	No Limit
		EP075-EM: 4-Nitrophenol	100-02-7	5	mg/kg	<5	<5	0.00	No Limit
		EP075-EM: 2-Methyl-4.6-dinitrophenol	8071-51-0	5	mg/kg	<5	<5	0.00	No Limit
		EP075-EM: Dinoseb	88-85-7	5	mg/kg	<5	<5	0.00	No Limit
		EP075-EM: 2-Cyclohexyl-4.6-Dinitrophenol	131-89-5	5	mg/kg	<5	<5	0.00	No Limit
EP075B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1826686)									
EM1811500-001	Anonymous	EP075-EM: Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075-EM: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075-EM: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075-EM: Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075-EM: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075-EM: Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075-EM: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075-EM: Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP075B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1826686) - continued									
EM1811500-001	Anonymous	EP075-EM: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075-EM: Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075-EM: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075-EM: Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075-EM: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075-EM: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075-EM: Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075I: Organochlorine Pesticides (QC Lot: 1826686)									
EM1811500-001	Anonymous	EP075-EM: alpha-BHC	319-84-6	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: Hexachlorobenzene (HCB)	118-74-1	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: beta-BHC	319-85-7	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: gamma-BHC	58-89-9	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: delta-BHC	319-86-8	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: Heptachlor	76-44-8	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: Aldrin	309-00-2	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: Heptachlor epoxide	1024-57-3	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: cis-Chlordane	5103-71-9	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: trans-Chlordane	5103-74-2	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: Endosulfan 1	959-98-8	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: Dieldrin	60-57-1	0.03	mg/kg	0.04	<0.03	0.00	No Limit
		EP075-EM: Endrin aldehyde	7421-93-4	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: Endrin	72-20-8	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: Endosulfan 2	33213-65-9	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: Endosulfan sulfate	1031-07-8	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: Methoxychlor	72-43-5	0.03	mg/kg	<0.03	<0.03	0.00	No Limit
		EP075-EM: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP075-EM: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP075-EM: 4.4`-DDT	50-29-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1824543)									
EM1811636-006	Anonymous	EP074-UT: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1826687)									
EM1811500-001	Anonymous	EP071-EM: C15 - C28 Fraction	----	100	mg/kg	130	110	20.1	No Limit
		EP071-EM: C29 - C36 Fraction	----	100	mg/kg	160	130	21.5	No Limit
		EP071-EM: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1824543)									
EM1811636-006	Anonymous	EP074-UT: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
		EP074-UT: C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1826687)									

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1826687) - continued									
EM1811500-001	Anonymous	EP071-EM: >C16 - C34 Fraction	----	100	mg/kg	220	180	21.2	No Limit
		EP071-EM: >C34 - C40 Fraction	----	100	mg/kg	110	<100	0.00	No Limit
		EP071-EM: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1831418)									
EM1811690-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0006	0.0007	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1831418)									
EM1811690-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1831418)									
EM1811690-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1831418)									
EM1811690-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1831418) - continued									
EM1811690-001	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EG005T: Total Metals by ICP-AES (QCLot: 1824592)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	94.9	79	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	88.6	85	109
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	92.1	78	108
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	89.3	78	106
EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	7.9 mg/kg	86.7	86	112
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	95.4	82	111
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	97.5	93	109
EG005T: Silver	7440-22-4	2	mg/kg	<2	2.1 mg/kg	81.4	80	108
EG005T: Tin	7440-31-5	5	mg/kg	<5	5.2 mg/kg	90.8	88	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	95.3	82	111
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1824593)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	88.9	77	104
EG048: Hexavalent Chromium (Alkaline Digest) (QCLot: 1826703)								
EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	40 mg/kg	82.3	75	112
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 1824383)								
EK026SF: Total Cyanide	57-12-5	1	mg/kg	<1	20 mg/kg	97.2	80	110
EK040T: Fluoride Total (QCLot: 1824280)								
EK040T: Fluoride	16984-48-8	40	mg/kg	<40	400 mg/kg	84.0	75	110
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1826685)								
EP066-EM: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	76.8	63	118
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 1824543)								
EP074-UT: Benzene	71-43-2	0.2	mg/kg	<0.2	2.1 mg/kg	85.3	74	118
EP074-UT: Toluene	108-88-3	0.5	mg/kg	<0.5	2.1 mg/kg	83.0	70	124
EP074-UT: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2.1 mg/kg	84.1	71	122
EP074-UT: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4.2 mg/kg	82.4	70	118
EP074-UT: Styrene	100-42-5	0.5	mg/kg	<0.5	2.1 mg/kg	86.6	76	116
EP074-UT: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2.1 mg/kg	85.6	74	114
EP074H: Naphthalene (QCLot: 1824543)								
EP074-UT: Naphthalene	91-20-3	1	mg/kg	<1	0.6 mg/kg	94.4	77	111
EP074I: Volatile Halogenated Compounds (QCLot: 1824543)								
EP074-UT: Vinyl chloride	75-01-4	0.02	mg/kg	<0.02	0.1 mg/kg	73.2	49	133
EP074-UT: 1.1-Dichloroethene	75-35-4	0.01	mg/kg	<0.01	0.1 mg/kg	80.5	62	127

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP074I: Volatile Halogenated Compounds (QCLot: 1824543) - continued								
EP074-UT: Methylene chloride	75-09-2	0.4	mg/kg	<0.4	2.1 mg/kg	89.1	68	107
EP074-UT: trans-1.2-Dichloroethene	156-60-5	0.02	mg/kg	<0.02	0.1 mg/kg	80.7	68	124
EP074-UT: cis-1.2-Dichloroethene	156-59-2	0.01	mg/kg	<0.01	0.1 mg/kg	85.1	74	118
EP074-UT: Chloroform	67-66-3	0.02	mg/kg	<0.02	0.1 mg/kg	84.6	72	118
EP074-UT: 1.1.1-Trichloroethane	71-55-6	0.01	mg/kg	<0.01	0.1 mg/kg	81.8	67	119
EP074-UT: Carbon Tetrachloride	56-23-5	0.01	mg/kg	<0.01	0.1 mg/kg	79.4	65	119
EP074-UT: 1.2-Dichloroethane	107-06-2	0.02	mg/kg	<0.02	0.1 mg/kg	87.2	73	120
EP074-UT: Trichloroethene	79-01-6	0.02	mg/kg	<0.02	0.1 mg/kg	79.4	72	124
EP074-UT: 1.1.2-Trichloroethane	79-00-5	0.04	mg/kg	<0.04	0.1 mg/kg	89.0	74	122
EP074-UT: Tetrachloroethene	127-18-4	0.02	mg/kg	<0.02	0.1 mg/kg	76.4	64	124
EP074-UT: 1.1.1.2-Tetrachloroethane	630-20-6	0.01	mg/kg	<0.01	0.1 mg/kg	81.5	70	119
EP074-UT: 1.1.2.2-Tetrachloroethane	79-34-5	0.02	mg/kg	<0.02	0.1 mg/kg	87.4	71	125
EP074-UT: Hexachlorobutadiene	87-68-3	0.02	mg/kg	<0.02	0.1 mg/kg	81.5	61	125
EP074-UT: Chlorobenzene	108-90-7	0.02	mg/kg	<0.02	0.1 mg/kg	86.9	73	117
EP074-UT: 1.4-Dichlorobenzene	106-46-7	0.02	mg/kg	<0.02	0.1 mg/kg	79.7	69	118
EP074-UT: 1.2-Dichlorobenzene	95-50-1	0.02	mg/kg	<0.02	0.1 mg/kg	83.1	75	114
EP074-UT: 1.2.4-Trichlorobenzene	120-82-1	0.01	mg/kg	<0.01	0.1 mg/kg	77.7	59	124
EP075A: Phenolic Compounds (Halogenated) (QCLot: 1826686)								
EP075-EM: 2-Chlorophenol	95-57-8	0.03	mg/kg	<0.03	2 mg/kg	90.3	54	122
EP075-EM: 2.4-Dichlorophenol	120-83-2	0.03	mg/kg	<0.03	2 mg/kg	99.2	58	131
EP075-EM: 2.6-Dichlorophenol	87-65-0	0.03	mg/kg	<0.03	2 mg/kg	94.1	55	118
EP075-EM: 4-Chloro-3-methylphenol	59-50-7	0.03	mg/kg	<0.03	2 mg/kg	97.1	62	129
EP075-EM: 2.4.5-Trichlorophenol	95-95-4	0.05	mg/kg	<0.05	2 mg/kg	100	53	121
EP075-EM: 2.4.6-Trichlorophenol	88-06-2	0.05	mg/kg	<0.05	2 mg/kg	95.6	60	126
EP075-EM: 2.3.5.6-Tetrachlorophenol	935-95-5	0.03	mg/kg	<0.03	2 mg/kg	88.1	56	118
EP075-EM: 2.3.4.5 & 2.3.4.6-Tetrachlorophenol	4901-51-3/5 8-90-2	0.05	mg/kg	<0.05	4 mg/kg	89.5	54	125
EP075-EM: Pentachlorophenol	87-86-5	0.2	mg/kg	<0.2	4 mg/kg	83.4	52	124
EP075A: Phenolic Compounds (Non-halogenated) (QCLot: 1826686)								
EP075-EM: Phenol	108-95-2	1	mg/kg	<1	2 mg/kg	90.7	56	120
EP075-EM: 2-Methylphenol	95-48-7	1	mg/kg	<1	2 mg/kg	90.4	52	131
EP075-EM: 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	4 mg/kg	91.8	59	132
EP075-EM: 2-Nitrophenol	88-75-5	1	mg/kg	<1	2 mg/kg	96.2	53	130
EP075-EM: 2.4-Dimethylphenol	105-67-9	1	mg/kg	<1	2 mg/kg	81.2	43	120
EP075-EM: 2.4-Dinitrophenol	51-28-5	5	mg/kg	<5	12 mg/kg	113	23	125
EP075-EM: 4-Nitrophenol	100-02-7	5	mg/kg	<5	12 mg/kg	92.4	59	133
EP075-EM: 2-Methyl-4.6-dinitrophenol	8071-51-0	5	mg/kg	<5	12 mg/kg	86.1	47	125
EP075-EM: Dinoseb	88-85-7	5	mg/kg	<5	12 mg/kg	89.1	51	123
EP075-EM: 2-Cyclohexyl-4.6-Dinitrophenol	131-89-5	5	mg/kg	<5	10 mg/kg	60.0	12	132

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 1826686)								
EP075-EM: Naphthalene	91-20-3	0.5	mg/kg	<0.5	2 mg/kg	94.0	58	121
EP075-EM: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	2 mg/kg	93.7	55	126
EP075-EM: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	2 mg/kg	96.6	59	120
EP075-EM: Fluorene	86-73-7	0.5	mg/kg	<0.5	2 mg/kg	95.9	64	122
EP075-EM: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	2 mg/kg	95.0	70	128
EP075-EM: Anthracene	120-12-7	0.5	mg/kg	<0.5	2 mg/kg	96.5	55	127
EP075-EM: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	2 mg/kg	97.8	68	134
EP075-EM: Pyrene	129-00-0	0.5	mg/kg	<0.5	2 mg/kg	98.5	69	131
EP075-EM: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	2 mg/kg	98.4	65	133
EP075-EM: Chrysene	218-01-9	0.5	mg/kg	<0.5	2 mg/kg	103	68	134
EP075-EM: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	0.5	mg/kg	<0.5	4 mg/kg	101	64	134
EP075-EM: Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	2 mg/kg	99.1	62	132
EP075-EM: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	2 mg/kg	101	55	137
EP075-EM: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	2 mg/kg	101	54	136
EP075-EM: Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	2 mg/kg	102	55	137
EP075I: Organochlorine Pesticides (QCLot: 1826686)								
EP075-EM: alpha-BHC	319-84-6	0.03	mg/kg	<0.03	2 mg/kg	97.9	68	122
EP075-EM: Hexachlorobenzene (HCB)	118-74-1	0.03	mg/kg	<0.03	2 mg/kg	96.5	65	122
EP075-EM: beta-BHC	319-85-7	0.03	mg/kg	<0.03	2 mg/kg	94.8	62	133
EP075-EM: gamma-BHC	58-89-9	0.03	mg/kg	<0.03	2 mg/kg	99.8	68	126
EP075-EM: delta-BHC	319-86-8	0.03	mg/kg	<0.03	2 mg/kg	97.5	68	133
EP075-EM: Heptachlor	76-44-8	0.03	mg/kg	<0.03	2 mg/kg	96.9	62	128
EP075-EM: Aldrin	309-00-2	0.03	mg/kg	<0.03	2 mg/kg	97.8	66	128
EP075-EM: Heptachlor epoxide	1024-57-3	0.03	mg/kg	<0.03	2 mg/kg	98.7	62	133
EP075-EM: cis-Chlordane	5103-71-9	0.03	mg/kg	<0.03	2 mg/kg	99.7	62	132
EP075-EM: trans-Chlordane	5103-74-2	0.03	mg/kg	<0.03	2 mg/kg	98.9	61	133
EP075-EM: Endosulfan 1	959-98-8	0.03	mg/kg	<0.03	2 mg/kg	82.0	63	136
EP075-EM: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	2 mg/kg	97.1	57	131
EP075-EM: Dieldrin	60-57-1	0.03	mg/kg	<0.03	2 mg/kg	100	65	137
EP075-EM: Endrin aldehyde	7421-93-4	0.03	mg/kg	<0.03	2 mg/kg	130	24	174
EP075-EM: Endrin	72-20-8	0.03	mg/kg	<0.03	2 mg/kg	67.1	55	148
EP075-EM: Endosulfan 2	33213-65-9	0.03	mg/kg	<0.03	2 mg/kg	100	66	135
EP075-EM: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	2 mg/kg	97.5	66	134
EP075-EM: Endosulfan sulfate	1031-07-8	0.03	mg/kg	<0.03	2 mg/kg	103	63	139
EP075-EM: 4.4`-DDT	50-29-3	0.05	mg/kg	<0.05	2 mg/kg	102	59	134
EP075-EM: Methoxychlor	72-43-5	0.03	mg/kg	<0.03	2 mg/kg	99.8	61	136
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1824543)								
EP074-UT: C6 - C9 Fraction	----	10	mg/kg	<10	39.6 mg/kg	88.7	69	114

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1826687)								
EP071-EM: C10 - C14 Fraction	----	50	mg/kg	<50	806 mg/kg	93.7	73	134
EP071-EM: C15 - C28 Fraction	----	100	mg/kg	<100	3006 mg/kg	98.3	81	112
EP071-EM: C29 - C36 Fraction	----	100	mg/kg	<100	1584 mg/kg	93.5	77	116
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1824543)								
EP074-UT: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	48.9 mg/kg	88.1	69	112
EP074-UT: C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1826687)								
EP071-EM: >C10 - C16 Fraction	----	50	mg/kg	<50	1160 mg/kg	94.3	77	127
EP071-EM: >C16 - C34 Fraction	----	100	mg/kg	<100	3978 mg/kg	97.0	79	113
EP071-EM: >C34 - C40 Fraction	----	100	mg/kg	<100	313 mg/kg	83.0	68	124
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1831418)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	60.0	57	121
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.6	55	125
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.2	52	126
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.8	54	123
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	74.8	55	127
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	54	125
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1831418)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	62.9	52	128
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.6	54	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	58	127
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	57	128
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.2	60	134
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	63	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	55	130
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.8	62	130
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.2	53	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	70.8	49	129
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	59	129
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1831418)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	69.2	52	132
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	67.6	65	126
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	71.8	64	126
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.8	63	124
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	76.9	58	125

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1831418) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	73.2	61	130
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	63.2	55	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1831418)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	85.6	54	130
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	77.2	61	130
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	83.2	62	130
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	74.8	60	130

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	Recovery Limits (%) High
EG005T: Total Metals by ICP-AES (QCLot: 1824592)							
EM1811557-049	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	94.7	78	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	94.4	84	116
		EG005T: Copper	7440-50-8	50 mg/kg	98.6	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	97.6	76	124
		EG005T: Molybdenum	7439-98-7	50 mg/kg	79.1	79	117
		EG005T: Nickel	7440-02-0	50 mg/kg	96.4	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	86.3	71	125
		EG005T: Zinc	7440-66-6	50 mg/kg	95.2	74	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1824593)							
EM1811557-049	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	95.1	76	116
EG048: Hexavalent Chromium (Alkaline Digest) (QCLot: 1826703)							
EM1811728-002	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	40 mg/kg	59.4	58	114
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 1824383)							
EM1811636-012	Anonymous	EK026SF: Total Cyanide	57-12-5	20 mg/kg	92.0	77	113
EK040T: Fluoride Total (QCLot: 1824280)							
EM1811710-001	Anonymous	EK040T: Fluoride	16984-48-8	400 mg/kg	83.8	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1826685)							
EM1811557-003	Anonymous	EP066-EM: Total Polychlorinated biphenyls	----	1 mg/kg	79.6	36	152
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 1824543)							

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 1824543) - continued							
EM1811636-012	Anonymous	EP074-UT: Benzene	71-43-2	2 mg/kg	71.7	50	138
		EP074-UT: Toluene	108-88-3	2 mg/kg	70.4	56	134
EP074I: Volatile Halogenated Compounds (QCLot: 1824543)							
EM1811636-012	Anonymous	EP074-UT: 1.1-Dichloroethene	75-35-4	2 mg/kg	70.0	26	141
		EP074-UT: Trichloroethene	79-01-6	2 mg/kg	63.5	50	134
		EP074-UT: Chlorobenzene	108-90-7	2 mg/kg	73.7	28	134
EP075A: Phenolic Compounds (Halogenated) (QCLot: 1826686)							
EM1811557-007	Anonymous	EP075-EM: 2-Chlorophenol	95-57-8	1 mg/kg	86.1	34	118
		EP075-EM: 4-Chloro-3-methylphenol	59-50-7	1 mg/kg	65.9	41	139
		EP075-EM: Pentachlorophenol	87-86-5	1 mg/kg	44.7	10	144
EP075A: Phenolic Compounds (Non-halogenated) (QCLot: 1826686)							
EM1811557-007	Anonymous	EP075-EM: Phenol	108-95-2	1 mg/kg	77.3	32	134
		EP075-EM: 2-Nitrophenol	88-75-5	1 mg/kg	57.4	13	129
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 1826686)							
EM1811557-007	Anonymous	EP075-EM: Acenaphthene	83-32-9	1 mg/kg	94.7	46	138
		EP075-EM: Pyrene	129-00-0	1 mg/kg	112	27	169
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1824543)							
EM1811636-012	Anonymous	EP074-UT: C6 - C9 Fraction	----	28 mg/kg	67.4	43	111
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1826687)							
EM1811684-001	Anonymous	EP071-EM: C10 - C14 Fraction	----	806 mg/kg	101	53	123
		EP071-EM: C15 - C28 Fraction	----	3006 mg/kg	106	70	124
		EP071-EM: C29 - C36 Fraction	----	1584 mg/kg	101	64	118
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1824543)							
EM1811636-012	Anonymous	EP074-UT: C6 - C10 Fraction	C6_C10	33 mg/kg	65.9	42	106
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1826687)							
EM1811684-001	Anonymous	EP071-EM: >C10 - C16 Fraction	----	1160 mg/kg	101	65	123
		EP071-EM: >C16 - C34 Fraction	----	3978 mg/kg	104	67	121
		EP071-EM: >C34 - C40 Fraction	----	313 mg/kg	100	44	126
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1831418)							
EM1811690-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	61.6	50	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	86.8	50	130
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	88.0	50	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	86.8	50	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	116	50	130
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	128	50	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1831418)							

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	Recovery Limits (%) High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1831418) - continued							
EM1811690-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	55.6	30	130
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	65.6	50	130
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	82.0	50	130
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	119	50	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	81.2	50	130
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	68.8	50	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	75.2	50	130
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	50.0	50	130
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	96.8	50	130
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	114	30	130
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	120	30	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1831418)							
EM1811690-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	84.4	50	130
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	51.9	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	46.2	30	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	69.7	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	59.4	30	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	115	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	65.6	30	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1831418)							
EM1811690-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	69.2	50	130
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	58.8	50	130
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	126	50	130
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	126	50	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM1811718**	Page	: 1 of 7
Client	: **SENVERSA PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: SAM O'CONNOR	Telephone	: +61-3-8549 9600
Project	: M16733	Date Samples Received	: 24-Jul-2018
Site	: ----	Issue Date	: 30-Jul-2018
Sampler	: SAM O'CONNOR	No. of samples received	: 4
Order number	:	No. of samples analysed	: 3

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA001: pH in soil using 0.01M CaCl extract							
Soil Glass Jar - Unpreserved (EA001) QA6	**19-Jul-2018**	**25-Jul-2018**	26-Jul-2018	✓	**25-Jul-2018**	25-Jul-2018	✓
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055) QA2, QA4	**19-Jul-2018**	**----**	----	----	**25-Jul-2018**	02-Aug-2018	✓
Soil Glass Jar - Unpreserved (EA055) QA6	**19-Jul-2018**	**----**	----	----	**24-Jul-2018**	02-Aug-2018	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) QA6	**19-Jul-2018**	**25-Jul-2018**	15-Jan-2019	✓	**25-Jul-2018**	15-Jan-2019	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) QA6	**19-Jul-2018**	**25-Jul-2018**	16-Aug-2018	✓	**25-Jul-2018**	16-Aug-2018	✓
EG048: Hexavalent Chromium (Alkaline Digest)							
Soil Glass Jar - Unpreserved (EG048G) QA6	**19-Jul-2018**	**25-Jul-2018**	16-Aug-2018	✓	**25-Jul-2018**	01-Aug-2018	✓
EK026SF: Total CN by Segmented Flow Analyser							
Soil Glass Jar - Unpreserved (EK026SF) QA6	**19-Jul-2018**	**24-Jul-2018**	02-Aug-2018	✓	**25-Jul-2018**	07-Aug-2018	✓
EK040T: Fluoride Total							
Soil Glass Jar - Unpreserved (EK040T) QA6	**19-Jul-2018**	**24-Jul-2018**	16-Aug-2018	✓	**26-Jul-2018**	16-Aug-2018	✓
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066-EM) QA6	**19-Jul-2018**	**25-Jul-2018**	02-Aug-2018	✓	**25-Jul-2018**	03-Sep-2018	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP074-UT) QA6	**19-Jul-2018**	**24-Jul-2018**	26-Jul-2018	✓	**25-Jul-2018**	26-Jul-2018	✓
EP074H: Naphthalene							
Soil Glass Jar - Unpreserved (EP074-UT) QA6	**19-Jul-2018**	**24-Jul-2018**	26-Jul-2018	✓	**25-Jul-2018**	26-Jul-2018	✓

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
EP074I: Volatile Halogenated Compounds							
Soil Glass Jar - Unpreserved (EP074-UT) QA6	**19-Jul-2018**	**24-Jul-2018**	26-Jul-2018	✓	**25-Jul-2018**	26-Jul-2018	✓
EP075A: Phenolic Compounds (Halogenated)							
Soil Glass Jar - Unpreserved (EP075-EM) QA6	**19-Jul-2018**	**25-Jul-2018**	02-Aug-2018	✓	**25-Jul-2018**	03-Sep-2018	✓
EP075A: Phenolic Compounds (Non-halogenated)							
Soil Glass Jar - Unpreserved (EP075-EM) QA6	**19-Jul-2018**	**25-Jul-2018**	02-Aug-2018	✓	**25-Jul-2018**	03-Sep-2018	✓
EP075B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075-EM) QA6	**19-Jul-2018**	**25-Jul-2018**	02-Aug-2018	✓	**25-Jul-2018**	03-Sep-2018	✓
EP075I: Organochlorine Pesticides							
Soil Glass Jar - Unpreserved (EP075-EM) QA6	**19-Jul-2018**	**25-Jul-2018**	02-Aug-2018	✓	**25-Jul-2018**	03-Sep-2018	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP074-UT) QA6	**19-Jul-2018**	**24-Jul-2018**	26-Jul-2018	✓	**25-Jul-2018**	26-Jul-2018	✓
Soil Glass Jar - Unpreserved (EP071-EM) QA6	**19-Jul-2018**	**25-Jul-2018**	02-Aug-2018	✓	**25-Jul-2018**	03-Sep-2018	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP074-UT) QA6	**19-Jul-2018**	**24-Jul-2018**	26-Jul-2018	✓	**25-Jul-2018**	26-Jul-2018	✓
Soil Glass Jar - Unpreserved (EP071-EM) QA6	**19-Jul-2018**	**25-Jul-2018**	02-Aug-2018	✓	**25-Jul-2018**	03-Sep-2018	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) QA2, QA4	**19-Jul-2018**	**26-Jul-2018**	15-Jan-2019	✓	**27-Jul-2018**	04-Sep-2018	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) QA2, QA4	**19-Jul-2018**	**26-Jul-2018**	15-Jan-2019	✓	**27-Jul-2018**	04-Sep-2018	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) QA2, QA4	**19-Jul-2018**	**26-Jul-2018**	15-Jan-2019	✓	**27-Jul-2018**	04-Sep-2018	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) QA2, QA4	**19-Jul-2018**	**26-Jul-2018**	15-Jan-2019	✓	**27-Jul-2018**	04-Sep-2018	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) QA2, QA4	**19-Jul-2018**	**26-Jul-2018**	15-Jan-2019	✓	**27-Jul-2018**	04-Sep-2018	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PCB - VIC EPA 448.3 Screen	EP066-EM	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH in soil using a 0.01M CaCl2 extract	EA001	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds - Waste Classification	EP075-EM	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Fluoride	EK040T	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071-EM	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds - Ultra-trace	EP074-UT	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PCB - VIC EPA 448.3 Screen	EP066-EM	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds - Waste Classification	EP075-EM	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Fluoride	EK040T	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071-EM	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds - Ultra-trace	EP074-UT	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PCB - VIC EPA 448.3 Screen	EP066-EM	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds - Waste Classification	EP075-EM	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Fluoride	EK040T	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071-EM	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds - Ultra-trace	EP074-UT	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Matrix Spikes (MS) - Continued							
PCB - VIC EPA 448.3 Screen	EP066-EM	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds - Waste Classification	EP075-EM	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Fluoride	EK040T	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071-EM	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds - Ultra-trace	EP074-UT	1	3	**33.33**	**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 CaCl2 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 CaCl2 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).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	SOIL	In house: Referenced to USEPA SW846, Method 3060A. Hexavalent chromium is extracted by alkaline digestion. The digest is determined by photometrically by automatic discrete analyser, following pH adjustment. The instrument uses colour development using dephenylcarbazide. Each run of samples is measured against a five-point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Cyanide by Segmented Flow Analyser	EK026SF	SOIL	In house: Referenced to APHA 4500-CN C / ASTM D7511. Caustic leachates of soil samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM (2013) Schedule B(3)
Total Fluoride	EK040T	SOIL	(In-house) Total fluoride is determined by ion specific electrode (ISE) in a solution obtained after a Sodium Carbonate / Potassium Carbonate fusion dissolution.
PCB - VIC EPA 448.3 Screen	EP066-EM	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
TRH - Semivolatile Fraction	EP071-EM	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.
Volatile Organic Compounds - Ultra-trace	EP074-UT	SOIL	In house: Referenced to USEPA SW 846 - 8260B Extracts are analysed by Purge and Trap, Capillary GC/MS in partial SIM/Scan mode. Quantification is by comparison against an established multi-point calibration curves. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)

Analytical Methods	Method	Matrix	Method Descriptions
Volatile Organic Compounds - Ultra-trace - Summations	EP074-UT-SUM	SOIL	Summation of MAHs and VHCs
Semivolatile Organic Compounds - Waste Classification	EP075-EM	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 502)
SVOC - Waste Classification (Sums)	EP075-EM-SUM	SOIL	Summations for EP075 (EM variation)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-House. A portion of soil is extracted with MTBE. The extract is taken to dryness, made up in mobile phase. Analysis is by LC/MSMS, ESI Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. This method complies with the quality control definitions as stated in QSM 5.1. Data is reviewed in line with the DQOs as stated in QSM5.1

Preparation Methods	Method	Matrix	Method Descriptions
NaOH leach for CN in Soils	CN-PR	SOIL	In house: APHA 4500 CN. Samples are extracted by end-over-end tumbling with NaOH.
pH in soil using a 0.01M CaCl2 extract	EA001-PR	SOIL	In house: Referenced to Rayment and Higginson 4B1, 10 g of soil is mixed with 50 mL of 0.01M CaCl2 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)
Alkaline digestion for Hexavalent Chromium	EG048PR	SOIL	In house: Referenced to USEPA SW846, Method 3060A.
Total Fluoride	EK040T-PR	SOIL	In house: Samples are fused with Sodium Carbonate / Potassium Carbonate flux.
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)
Sample Extraction for PFAS	EP231-PR	SOIL	In house
Methanolic Extraction of Soils - Ultra-trace.	ORG16-UT	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 - VIC EPA Screen	ORG17-EM	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.

senversa

tel: + 61 3 9606 0070
fax: + 61 3 9606 0074
enquiries@senversa.com.au
www.senversa.com.au
Level 6, 15 William Street, Melbourne, VIC 3000
Senversa Pty Ltd ABN 89 132 231 380