

Preliminary Site Investigation and Limited Sampling, Perth Airport



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Acronyms

Acronym	Description
6:2 FtS	6:2 Fluorotelomer Sulfonate
ACM	Asbestos Containing Material
AECOM	AECOM Australia Pty Ltd
AFFF	Aqueous Film Forming Foam
AHD	Australian Height Datum
APEC	Area of Potential Environmental Concern
ARFF	Aviation Rescue and Fire Fighting
ASC	Australian Soil Classification
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure
ASRIS	Australian Soil Resource Information System
AST	Above Ground Storage Tank
BFC	Bromochlorodifluoromethane
bgl	Below Ground Level
BOM	Bureau of Meteorology
BTEXN	Benzene, Ethylbenzene, Toluene, Xylene, Naphthalene
btoc	Below Top of Casing
CASA	Civil Aviation Safety Authority
CSM	Conceptual Site Model
DFES	Department of Fire and Emergency Services
DSI	Detailed Site Investigation
ESA	Environmental Site Assessment
FESA	Fire and Emergency Services Authority
FFTG	Former Fire Training Ground
IBC	Intermediate Bulk Container
LOR	Limit of reporting
NA	Natural Attenuation
ODS	Ozone Depleting Substances
OIT	Oil Interception Trap
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PSI	Preliminary Site Investigation
PFAS	Per- and Poly- fluoro alkyl substances
PFHxS	Perfluorohexane Sulfonate
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonate
PSI	Preliminary Site Investigation
SAQP	Sampling Analysis and Quality Plan
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
UST	Underground Storage Tank

Executive Summary

AECOM Australia Pty Ltd (AECOM) was engaged by Airservices Australia (Airservices) to undertake a Preliminary Site Investigation (PSI) and limited sampling to identify areas that have been potentially impacted by Aqueous Film Forming Foam (AFFF), which contains per- and poly- fluoro alkyl substances (PFAS). This scope of work is limited to AFFF affected areas and infrastructure; and was focussed on areas historically used for Aviation Rescue and Fire Fighting (ARFF) and for other firefighting activities at the Perth Airport (the Site).

The objectives of this PSI and limited sampling were to:

- Confirm the site history with regards to AFFF activities and determine the relevant Areas of Potential Environmental Concern (APEC).
- Implement the Sampling, Analysis and Quality Plan (SAQP) (AECOM, 2017b) to address the following data gaps:
 - **Data Gap 1:** Presence/Absence of PFAS Impacts in Soil and/or Sediment
 - **Data Gap 2:** Presence/Absence of PFAS Impacts in Groundwater
 - **Data Gap 3:** Presence/Absence of PFAS Impacts at Site Boundaries
- Confirm the presence or absence of PFAS or other identified Contaminants of Potential Concern (COPC) impacts to soil or sediment (in surface drains), within shallow groundwater and at inferred APEC or at overall Site boundaries.
- Investigate the seven (7) APEC with AFFF related sources of contamination and identify key receptors and potential contaminant transport pathways.
- Update the conceptual site model (CSM).

The review of available data, site interviews and inspections has indicated that multiple locations have been (or may have been) impacted by historical ARFF activities using AFFF at the Perth Airport:

- Fuels and AFFF were used at the Fire Training Ground (FTG) in training exercises. Previous intrusive investigations have confirmed Total Recoverable Hydrocarbons (TRH), Benzene, Toluene, Ethylbenzene, total Xylenes, Naphthalene (BTEXN), PFOS and PFOA presence in surface soils and the vertical and lateral extent of these impacts in soil and groundwater remains undefined.
- AFFF was stored at the former ARFF fire station between approximately 1980 and 2010. Investigations prior to the demolition of the former Fire Station area confirmed PFAS impacts in nearby soils and concrete. Demolition and remediation work wastes from that project remain stored in sealed stockpiles in the Airport North area.
- PFAS contamination has been confirmed in groundwater in the vicinity of the Former Workshop and Tyre Store located in the Airport West commercial/industrial precinct.
- PFAS contamination has been identified in soil, concrete, sediment and surface water across various other locations, confirming a relatively widespread distribution of PFAS at the site, not necessarily solely related to ARFF activities, given the presence of other non-ARFF PFAS related sources. This extent of PFAS distribution has been exaggerated as a result of the abstraction and reticulation of groundwater for irrigation purposes and by the hydraulic interaction between shallow groundwater and the open channel drainage network.

APEC with respect to AFFF sources potentially related to ARFF activities were identified and evaluated in a tabulated Conceptual Site Model (CSM), with data gaps identified as follows:

- APEC 1: Former Workshop and Tyre Store
- APEC 2: Former ARFF Fire Station
- APEC 3a: Current Fire Training Ground
- APEC 3b: Incinerator Building
- APEC 4: Current ARFF Fire Station
- APEC 5: Suspected Former Fire Training Area A (Airport Central)
- APEC 6: Suspected Former Fire Training Area B (Airport West)

It is noted that APEC 1 through 3a have been previously investigated, whereas APEC 3b through 6 were identified during the PSI as potentially being affected by PFAS. Overall surface water and groundwater locations were also sampled in conjunction with APEC areas.

The results of the limited sampling indicated:

- PFAS concentrations in all soil samples were reported less than the adopted assessment criteria for human health at all locations sampled within each APEC.
- PFAS concentrations in all soil samples were reported less than the adopted assessment criteria for ecological health at all locations sampled within each APEC sampled.
- Reported recoverable hydrocarbon concentrations in soil samples were reported at concentrations either less than the laboratory LOR or the adopted assessment criteria for human and environmental health at all locations within each APEC.
- PFAS concentrations in surface water were greater than the adopted assessment criteria for human and environmental health within all APECs where surface water was sampled.
- PFAS concentrations in groundwater were greater than the adopted assessment criteria for human and environmental health within all APECs and at selected down-gradient monitoring well locations.
- Reported recoverable hydrocarbon concentrations did not exceed the adopted HSL for surface water and groundwater samples.

Based on the information obtained as part of the PSI and limited sampling, the following conclusions can be made:

- The data gaps determined in the SAQP (AECOM 2017b) have been assessed and closed:
 - **Data Gap 1:** PFAS concentrations are marginally present in soil in the areas investigated.
 - **Data Gap 2:** PFAS impacts are present in groundwater and surface water in the areas investigated.
 - **Data Gap 3:** PFAS impacts are present at the Site boundary in surface water and present in groundwater at the APEC boundaries.
- The updated CSM indicates that SPR linkages remain “*possible*” to “*probable*” based on the data collected during the limited sampling.

1.0 Introduction

AECOM Australia Pty Ltd (AECOM) was engaged by Airservices Australia (Airservices) to undertake a Preliminary Site Investigation (PSI) and limited sampling to identify areas that have been potentially impacted by Aqueous Film Forming Foam (AFFF), which contains per- and poly- fluoro alkyl substances (PFAS). This scope of work is limited to AFFF affected areas and infrastructure and was focussed on areas historically used for Aviation Rescue and Fire Fighting (ARFF) and for other firefighting activities at the Perth Airport (the Site – **Figure 1a**).

This investigation has adopted processes detailed in the National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended in 2013), referred to hereafter as the 'ASC NEPM'.

This report builds on preliminary work undertaken by AECOM in 2016, developing the initial PSI and preliminary CSM for the Site, which focused on the identification of several potential and unquantified contamination exposure pathways, primarily associated with 7 Areas of Potential Environmental Concern (APEC) (attached **Figures 2a** and **2b**).

The PSI Report (AECOM, 2017a) and associated CSM (and data-gap assessment) provided the basis for designing a supplementary stage of limited intrusive site investigations and to guide the forward assessment of contaminant exposure risks. A Sampling and Analysis Quality Plan (SAQP) was developed for the limited sampling as reported herein (AECOM, 2017b).

1.1 Background

Airservices operations at the Perth Airport have been provided from subleased areas of the Site including the following facilities and land parcels:

- Former Mechanical Workshop and Tyre Store
- Former ARFF station
- Operations Centre and Office
- Navigation Equipment and Office
- Air Traffic Control Tower
- Fire Fighting Training Ground and Fire Station
- Incinerator Building

Airservices Australia and its aviation firefighting remit was established in 1995. Prior to 1995, ARFF services were provided by the Civil Aviation Authority (CAA). The CAA was established in July 1988 and its responsibilities were subsequently split between two separate government organisations in July 1995: Airservices Australia and the Civil Aviation Safety Authority (CASA).

AFFF has been used for fire-fighting purposes around Australia since the late 1970s/early 1980s. On airports, AFFF has been stored and/or used at fuel depots, hangars and for operational and fire training purposes at ARFF areas. The ARFF functions provided by Airservices and its predecessors used an AFFF for operational and training purposes from 1978 until 2010. AFFF has not been used in ARFF activities by Airservices since 2010.

As a source of contamination, AFFF has been found to contain PFAS, which are considered to present potential risks to human health and the environment. Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA) are stable organic compounds that are resistant to break down in the natural environment. International studies have indicated that both are persistent chemicals, which can bio-accumulate within the natural environments into which they are allowed to enter.

1.2 Objectives

The objectives of this PSI and limited sampling were to:

- Confirm the site history with regards to AFFF activities and determine the relevant APEC.
- Implement the Sampling, Analysis and Quality Plan (SAQP) (AECOM, 2017b) to address the following data gaps:
 - **Data Gap 1:** Presence/Absence of PFAS Impacts in Soil and/or Sediment
 - **Data Gap 2:** Presence/Absence of PFAS Impacts in Groundwater
 - **Data Gap 3:** Presence/Absence of PFAS Impacts at Site Boundaries
- Confirm the presence or absence of PFAS or other identified Contaminants of Potential Concern (COPC) impacts to soil or sediment (in surface drains), within shallow groundwater and at inferred APEC or at overall Site boundaries.
- Investigate the seven APEC with AFFF related sources of contamination and identify key receptors and potential contaminant transport pathways:
 - APEC 1: Former Workshop and Tyre Store
 - APEC 2: Former ARFF Fire Station
 - APEC 3a: Current Fire Training Ground
 - APEC 3b: Incinerator Building
 - APEC 4: Current ARFF Fire Station
 - APEC 5: Suspected Former Fire Training Area A (Airport Central)
 - APEC 6: Suspected Former Fire Training Area B (Airport West)
- Update the conceptual site model (CSM) and identify any outstanding data gaps to assist in the evaluation of potential risks posed by identified PFAS compounds to Site users and/or the local environment.

The layout and extent of APECs and surface water drainage features are presented on **Figure 2a** and **Figure 2b**. It is noted that the APEC boundaries were broadly identified based on historical land use activities and are not necessarily directly correlated with the current Airservices lease areas.

1.3 Scope of Works

In order to address the objectives outlined above, the following works were undertaken as part of the investigation:

- Development of the PSI and SAQP to conduct a targeted PFAS and hydrocarbon contamination investigation at the identified APECs;
- Developed a Site specific Health Safety and Environment Plan (HSEP);
- Acquired Dial-Before-You-Dig (DBYD) underground utility plans;
- Liaised with both Airservices and other Stakeholders to obtain available as-built or block plans;
- Supervised [REDACTED], certified cable location contractors for the mark out of underground utilities in the areas of investigation;
- Supervision of non-destructive digging (NDD) by hand auger to clear services at 26 locations to a minimum depth of 1.5 m below ground level (bgl) prior to the commencement of any mechanical drilling activities;
- Supervision of drilling works undertaken by [REDACTED] followed by completion of 26 soil bores, of which 7 were converted to monitoring wells;
- Soil logging of the geological profile at each location;

- Development of all 7 wells using a submersible down-hole pump conducted by [REDACTED];
- Gauging round of all groundwater monitoring wells conducted by AECOM;
- Collection of soil, sediment, surface water and groundwater samples;
- Surveying of all bores for location and elevation conducted by [REDACTED]; and
- Completion of this PSI with limited sampling report detailing the works undertaken, analytical results and updating the preliminary CSM.

Works undertaken to specifically address **Data Gaps 1 – 3** are outlined by APEC in **Table 1** below:

Table 1 Completed Works and Sample Plan Deviation

APEC	Rationale (as per AECOM, 2017b)	Instances and Reasons for Deviation from SAQP (AECOM, 2017b)	Completed works (September to November 2017)
1 Former Workshop and Tyre Store	Collection and analysis of up to 5 Groundwater samples through existing monitoring wells	Groundwater samples were collected at a higher frequency than specified in the SAQP (AECOM, 2017b) where other existing monitoring wells were found with the addition of a surface water sample based on access and available water in drains	6 groundwater samples were collected from existing monitoring wells (MW22, MW26, MW29, MW34, MW35, MW37). Collection and analysis of 1 surface water sample (SW5)
2 Former ARFF Fire Station	- Collection and analysis of up to 5 Groundwater samples - Collection and analysis of 2 surface waters (SW1717 and SW1718)	Groundwater samples were collected at a lower frequency than specified in the SAQP (AECOM, 2017b) due to the location's proximity to an active taxiway for aircraft	2 groundwater samples were collected from existing monitoring wells (MW0220, MW0221) Collection and analysis of 2 surface water samples (SW1717 and SW1718)
3a Current Fire Training Ground	- Collection and analysis of up to 5 Groundwater samples - Collection and analysis of 4 surface water samples including up-gradient locations and from any drainage feature connecting to the North Main Drain (NMD)	Groundwater samples were collected at a lower frequency than specified in the SAQP (AECOM, 2017b) as ONW4 could not be found. Less surface water samples were collected along drainage features as they were dry	Three groundwater samples were collected from existing wells (MW-FTG1, MW-FTG-2, MW-FTG3) and one surface water sample (SW1720)
3b Old Incinerator Building	- Advancement of 4 soil bores with associated soil sampling at intervals of 0.0-0.1 mbgl to 0.1-0.5 mbgl - Conversion of 1 new soil bore into a groundwater monitoring well to a nominal depth of 6 m bgl - Four surface water samples including samples from drainage features connecting to the NMD and up gradient locations	An additional soil bore was advanced. No surface water samples were collected at this APEC as no drainage lines were identified close to APEC 3b	Advancement of 5 soil bores (SB1711, SB1712, SB1713, SB1714 and SB17071) with soil bore SB1712 converted to a groundwater monitoring well to a total depth of 8.5 m bgl (MW1708) Collection and analysis of 1 groundwater sample from monitoring well MW1708
4 Current ARFF Fire Station	- Advancement of 4 soil bores with associated soil sampling at intervals of 0.0-0.1 mbgl to 0.1-0.5 mbgl - Conversion of 1 soil bore into a groundwater monitoring well - Four surface water samples including samples from drainage features connecting to the NMD and up-gradient locations	No surface water samples were collected at this APEC. Only one drainage feature was identified and access to it was restricted due to its proximity to the runway	Advancement of 4 soil bores (SB1722, SB1723, SB1724 and SB1725) and conversion of one soil bore (SB1724) into a groundwater monitoring well (MW1706) Collection and analysis of 1 groundwater sample from monitoring well MW1706 Drainage features were dry on day of sampling.
5 Suspected Former Fire Training Area A (Airport Central)	- Advancement of 7 soil bores with associated soil sampling at intervals of 0.0-0.1 mbgl to 0.1-0.5 mbgl - Conversion of 2 soil bores into groundwater monitoring wells - Sampling of existing monitoring well MW0179 3 surface water samples	No deviation from SAQP	Advancement of 7 soil bores (SB1704, SB1705, SB1715, SB1718, SB1719, SB1720 and SB1721) and conversion of SB1716 and SB1717 into monitoring wells MW1705 and MW1704 respectively. Collection and analysis of 3 groundwater samples from new wells MW1704 and MW1705 and from existing monitoring well MW0179. Collection of 3 surface water samples SW1722, SW1723 and SW1724
6 Suspected Former Fire Training Area B (Airport West)	- Advancement of 10 soil bores with associated soil sampling at intervals of 0.0-0.1 mbgl to 0.1-0.5 mbgl - Conversion of 3 soil bores into groundwater monitoring wells 3 surface water samples	Additional sample collected from existing monitoring well ONW6	Advancement of 10 soil bores (SB1701 to SB1710) and conversion of SB1701, SB1702 and SB1709 into monitoring wells MW1701, MW1702 and MW1703 respectively. Collection and analysis of 3 groundwater samples from new wells MW1701 to MW1703 and from existing monitoring well ONW6. Collection of 3 surface water samples SW1704, SW1706 and SW1707
Overall Site Locations	- Collection of up to 8 groundwater samples from existing monitoring wells - Collection of up to 18 surface water and/or sediment samples from various drains depending on access at the time of sampling. - General site conditions assessed for boundary and background investigation to determine incoming and outgoing impacts related to COPCs.	Surface water and groundwater sampling conducted to ensure in and out flow across the site was captured. Six of the nine proposed wells were sampled (3 were found to contain data loggers and not sampled). Sediment samples were unable to be collected due to access and safety issues (drainage lines were densely vegetated, deep and steep).	9 surface waters (SW1701, SW1702, SW1705, SW1708, SW1709, SW1710, SW1711, SW1712, SW1713, SW1714, SW1715 and SW1716) 6 Groundwater monitoring wells (MW0120N, MW0135, MW0146, MW0154, MW0172 and MW0180)

2.0 Airport Site Identification and Current Land Uses

Perth Airport is located approximately twelve kilometres east of Perth's Central Business District (CBD). Details of the Site are summarised in **Table 2** below.

Table 2 Perth Airport Site Details

Item	Description
Airport Owner	Commonwealth of Australia
Airport Occupiers	- Perth Airport Pty Ltd (PAPL) - a wholly owned subsidiary of Perth Airport Development Group Pty Ltd (PADG) - Various aviation related leaseholders and tenants
Airport Address	Perth Airport, Western Australia (WA), 6105
Local Government Authorities	City of Swan, City of Belmont and Shire of Kalamunda
Current Zoning	- Public Purpose (Western Australian Planning Commission and Metropolitan Region Scheme) - Public Purpose (City of Swan, Town Planning Scheme No. 17) - Commercial Land Use (City of Belmont, Local Planning Scheme No. 15) - Public Purpose (Shire of Kalamunda, Town Planning Scheme No 3)
Current Land Use	International and domestic airport facilities and related services (including commercial, industrial and other activities).
Proposed Land Use	No change
Site Elevation	Between approximately 10m and 30m above Australian Height Datum (m AHD)
Site Area	Approximately 2,105 Ha
Site Location	Figure 1a
Site Layout	Figure 1b and Figure 1c

In accordance with the 2014, Airport Master Plan, the Site is divided into (5) five reference areas. These areas nominally identify differing airport use and infrastructure areas and are presently referred to as:

- Airport North
- Airport West
- Airport Central
- Airport South
- Airfield

These nominal Site areas are provided in **Figure 1b**; however, for the purposes of aiding reference throughout this report, AECOM has divided the 'Airfield' area (which in the Airport Master Plan incorporates potential future runway areas) and created the additional 'Airport East' area, as shown in **Figure 1b**.

2.1 Certificate of Title

Review of cadastral information indicates that the Site is comprised of 155 individual land parcels. Certificate of Title information relevant to areas used to provide Airservices functions are provided in **Appendix A**. Further Certificate of Title records are discussed in **Section 4.1**, in relation to historical site ownership.

The Site is subject to Commonwealth legislation, including legislation pertaining to the assessment and management of contamination.

2.1.1 Airservices Land Use on the Site

The Perth Airport Masterplan 2014 indicates that areas leased by Airservices at the Site include:

- Operations Centre and Office (Airport West)
- Navigation Equipment and Office (Airport West)
- Air Traffic Control Tower (Airport Central)
- Fire Fighting Training Ground and Fire Station (Airport North)

The following sites are no longer operational; and the leases between Airservices and Perth Airport Pty Ltd (formerly Westralia Airport Corporation) have ceased or are in the process of being surrendered.

- Former Mechanical Workshop and Tyre Store (Airport West)
- Former ARFF Station (Airport West / Airfield)
- Incinerator Building (Airport North)

The locations of these features are shown in **Figure 2**.

Lot 100 on Deposited Plan 6619 is a combined land parcel describing the majority of the northern half of the Airport Estate. A number of leases are listed on Certificate of Title Volume 2124, Folio 980 (as of 29 July 2016). Specific leases pertaining to Airservices Australia operations include the following agreements:

- G126336 (Lease)
- G126337 (Lease - expired)
- G126338 (Lease)
- G453151 (Lease)
- M394820 (Caveat)
- Building 262 (Lease)

2.2 Land Use

2.2.1 Current Land Use

PADG is the lessee of 155 lots of land that comprise the Site area of 2,105 hectares. It comprises an operational Airport, airfield and terminals, aviation related commercial facilities, roads and infrastructure services, a range of industrial, business and commercial activities and open areas of landscaped and natural vegetation, as well as seasonal and perennial wetland features.

The current layout of Site is shown in **Figure 1c**. The primary land use is for Domestic and International Airport purposes, with significant portions of both commercial and industrial facilities. Amongst other development and land uses, Perth Airport comprises the following primary facilities:

- Runways and taxiways
- Domestic terminal facilities, airport management buildings, communications and radar towers and an air traffic control tower
- Maintenance buildings and aircraft hangars (including separate hangars operated by numerous minor airlines and charter flight operators)
- Cargo handling and storage areas
- Fuel depot and tank farm
- ARFF fire station and ARFF fire training grounds
- Surrounding carparks and landscaped areas

2.2.2 Surrounding Land Use

Several regional arterial road networks converge in the region of Perth Airport, including the Great Eastern, Tonkin, Roe and Leath Highways. Important rail transport routes also lie east and south of the Airport. Surrounding land uses within 2 kilometres of the Airport boundary are further summarised in **Table 3**.

The Swan River lies northwest of the Airport and generally flows from the northeast to the southwest.

Table 3 Surrounding Land Use Summary

Direction	Description
North	The suburbs of Bassendean, Guildford and Hazelmere lie to the north of the Airport. Bassendean is located west of the Swan River and is a predominantly residential suburb. Guildford Cemetery is located immediately north of vacant land within the Airport Estate. A mixture of residential and commercial/industrial precincts exists north of this around Kalamunda Road and the Great Eastern Highway Bypass.
East	The residential suburb of High Wycombe is located beyond Abernathy Road, along the northern half of the eastern Airport boundary. A precinct of industrial property is located between the eastern Airport boundary and Dundas Road. Beyond this, in the area bounded by Maida Vale Road, Dundas Road and Roe Highway, several semi-rural residential properties exist, whereas further south, the land use becomes commercial/industrial.
South	The suburb of Forrestfield lies south east of the Airport and contains a mixture of industrial and residential property. Otherwise the Kewdale and Welshpool industrial areas dominate the area south of the Airport Estate. Extending from the Forrestfield Rail Marshalling Yards east of the Airport, the Kewdale inter-modal freight facility lies directly South of the airport and provides for logistical freight transfer between regional road and rail transport routes.
West	Aside from the Belmont commercial/industrial precinct, areas to the west, between the Airport and the Swan River, include the predominantly residential suburbs of Cloverdale, Belmont, Redcliffe and Ascot.

3.0 Environmental Setting

3.1 Topography

The Site is located on the Swan Coastal plain and upon the relatively level topography between the Darling Escarpment to the east and the Swan River to the west. Ground elevations across the Site range approximately between 10 - 30 m AHD.

3.2 Climate

The seasonal patterns of rainfall and temperature are important controlling factors on the water balance of the local groundwater and surface-water environments. Regional groundwater levels are generally at their annually highest elevation during September-October and at their lowest in April-May, in response to seasonal rainfall, temperature and evaporation patterns. The Bureau of Meteorology weather station (009021) located at the Site has been operational since 1944 and indicates the following:

- Average annual rainfall of approximately 767 mm, with May to August typically the wetter months (>50 mm per month)
- Average maximum monthly temperature from 1944 to 2016 ranged between 17.9°C and 32.0°C with January to March being the warmest months
- Average minimum monthly temperature from 1944 to 2016 ranged between 8.0°C and 17.5°C with July to September being the coldest months.

3.3 Geology

The Geological Survey of Western Australia 1:250,000 geological series map for Perth indicates the Site is located on unconsolidated sediments of the (Pleistocene) Bassendean Sands deposit, which are underlain by the sandy-silts and clays of the Guildford Formation. Low lying areas within the Swan Coastal Plain are also known to contain near-surface deposits of peaty clay or swampy deposits, as a result of the coastal and alluvial geomorphology of the Swan Coastal Plain.

Bassendean Sands typically consist of light grey, fine to medium grained sub-rounded quartz sand, which is moderately sorted. An iron-cemented layer of ferricrete rock (locally called coffee rock) is commonly encountered at water table depths within Bassendean Sand deposits. Guildford Formation deposits generally consist of mostly brown silty and slightly sandy clays, with interbedded lenses of fine to coarse grain poorly sorted sand.

The combined superficial deposits of the Bassendean Sands and Guildford Formation are mapped to be approximately 30 metres thick in the area of the Site and are underlain by siltstone and shale of the Kings Park Formation.

3.3.1 Acid Sulfate Soils

The ASRIS Atlas of Australian Acid Sulfate Soils indicates that the majority of the Site is regarded as having extremely low probability of Acid Sulfate Soils (ASS) occurrence, but that several pockets and areas are regarded as having a high probability of occurrence. These pockets coincide with small areas located in low lying wetland and dune swales.

3.4 Hydrogeology

The superficial (shallow) aquifer is unconfined and occurs within the Bassendean Sand and/or Guildford Formation soils. Consistent with the interpreted depth of the host geology, the superficial aquifer is also regarded to be approximately 30 metres thick in the area. Groundwater occurs at depths of between 1 – 6 mbgl depending on topography.

Bassendean Sand sediments in the area are relatively permeable with hydraulic conductivities of 5 to 10 metres per day (Davidson, 1985). The silt and clay dominant Guildford Formation is typically less permeable, with an average hydraulic conductivity of 3.3 metres per day (Davidson, 1985).

The seasonally influenced superficial aquifer forms within the high permeability Bassendean Sands in response to infiltrating rainfall. The higher clay content of the underlying Guildford Formation limits vertical percolation, resulting in saturation of the overlying sand. The WA Department of Water (DoW) Groundwater Atlas and historical groundwater monitoring data from bores located across the Site suggests that groundwater regionally flows from the southeast to the northwest across the Airport, towards the Swan River.

Rates of recharge and lateral hydraulic conductivity within the Guildford Formation are highly variable due to the range of lithology presented within the unit. The existence of high permeability sands and low permeability clays within the Guildford Formation can also contribute to localised areas of semi-confined aquifer condition. DoW information suggests that groundwater gradients are oriented in a more westerly flow direction within the Guildford Formation, again falling towards the Swan River.

3.4.1 Groundwater Use Within and Around the Airport

The Perth Airport 2014 Master Plan indicates that groundwater is abstracted from multiple bores across the Airport Estate to irrigate landscaped areas and to supply water for fire-fighting and construction purposes¹. In a Figure supplied by PAPL (dated 12 August 2016) a total 22 reticulation bores were identified. The majority of these bores are clustered around the two main terminal and car-parking areas, with 9 bores located close to T1/T2 facilities (Airport Central / Airport East) and 6 bores located in the vicinity of the T3/T4 facilities (Airport West).

A search for abstraction bores licensed with the DoW indicated that 31 abstraction bores are located within the Airport Estate or within a 500 metre radius of the Airport boundary. Groundwater bore searches on the DoW Water Information Reporting Database indicated that a total of 150 bores were installed within the same area, with the majority of these likely to be associated with groundwater quality monitoring activities. The 31 licensed abstraction bores and 150 registered bores are respectively shown in **Figure C-1** and **Figure C-2 of Appendix C**. Further discussions in relation to potential risks associated with abstracted groundwater use are presented in **Section 12.2**.

3.5 Surface Water Hydrology

All surface water networks throughout the Airport collect and direct runoff (and through-flowing water) from east to west, towards the Swan River. An extensive network of surface water features exists across the Airport Estate, including seasonal and perennial wetland features and both natural and engineered open-channel networks. These features variously intersect shallow groundwater levels and provide functional drainage of shallow ground profiles across the Airport. As a result the main drains contain surface water flows throughout the majority of the year and can behave as 'losing' or 'gaining' waterways, in response to complex and seasonally variable interactions between groundwater and surface water at the Site (and as occurs generally within low-lying sections of the Swan Coastal Plain).

The Perth Airport Master Plan describes that surface water of the Airport Estate is primarily managed in two catchments: the Northern Main Drain Catchment; and the Southern Main Drain Catchment. In addition, two smaller, mostly piped catchment networks exist within the Airport Estate.

3.5.1 Northern Main Drain

The NMD is a mostly open unlined channel through the Airport Estate. The NMD catchment is fed by three open channels that enter the eastern boundary of the Airport Estate north of Grogan Road. NMD channels then collect and divert flows from Airport Central and Airport North areas around the northern end of the runways, before continuing west, between the location of the ARFF Fire Station and Fire Training Ground. The NMD receives drainage from the northern half of the runway system and northern parts of the Airport West area, before exiting the Airport Estate beneath the Great Eastern Highway Bypass, as Limestone Creek, which discharges to the Swan River. Water Corporation (WA) administers the tributaries that feed into the NMD from east of the Airport. The City of Swan manages Limestone Creek between the Airport and the Swan River.

¹ Aircservices has confirmed with Perth Airport that all fire water hydrants are supplied through mains water from Water Corporation (WA). Groundwater is not used in Perth Airport fire hydrants (Perth Airport, 2018).

During peak flows when the capacity of the upper NMD network is exceeded, overflow occurs into the southern end of Munday Swamp. Once Munday Swamp reaches capacity, it overflows to the north back into a northern tributary of the NMD. In this manner, the Munday Swamp acts as a key flow detention and regulating feature of the NMD network.

3.5.2 Southern Main Drain

The Southern Main Drain (SMD) is an open unlined channel for most of its length through the Airport estate, but flows through several culverts across the estate, including a 1200mm culvert beneath the southern end of the main runway. Crumpet Creek enters the eastern boundary of the Airport Estate and becomes the SMD. The SMD channel then collects runoff from Airport South Area, the southern half of the runway network, most of the drainage from Airport West Precinct and some flows from the Tonkin Highway. The SMD exits the Airport Estate at Brearley Avenue into a reserve which drains into the Swan River. Water Corporation manages both the upstream Crumpet Creek and the downstream reaches of the SMD between the Airport and the Swan River.

3.5.3 Fauntleroy Avenue Catchment

The Fauntleroy catchment is a small catchment within the Airport estate that drains the T3, T4 and General Aviation areas, including the majority of the surrounding external carparks. It is mostly an underground piped network, which drains to the Swan River. In contrast to all other drainage catchments, PAPL assumes responsibility for the management of the pipeline between the catchment area and the Swan River.

3.5.4 North East Catchment

The North East catchment initially falls to the north and drains a part of the Airport North Area. Although still within the Airport Estate the mostly piped drainage network is then primarily associated with drainage of the industrial areas north of Kalamunda Road. The North East catchment then drains in a northwest direction and into the Helena River. Management of the wider areas contributing to this catchment is the responsibility of the Shire of Kalamunda.

4.0 Site History

4.1 Historical Site Ownership

The historical certificates of title and details of historical ownership of Airport Estate land parcels in which Airservices hold an interest are presented in **Table 4** below. These have been used to infer historic land uses. Historical certificates were obtained through Landgate with the certificate documentation presented in **Appendix B**.

Table 4 Summary of Title Information and Site Ownership History

Certificate of Title Volume and Folio	Date	Site Owner
Vol. 91 Fol. 146	25/9/1896	Cornelius Charles Fauntleroy
Vol. 137 Fol. 4	13/10/1897	John Hay
Vol. 153 Fol. 20	13/1/1906	John Hay
Vol. 340 Fol. 194	29/6/1906	Alfred Thomas Saunders
Vol. 450 Fol. 68	13/9/1909	Alfred Thomas Saunders
Vol. 832 Fol. 148	6/6/1925	Redcliffe Farms Limited
Vol. 1083 Fol. 760	15/8/1944	Commonwealth of Australia
Vol. 1089 Fol. 766	17/8/1945	Commonwealth of Australia
Vol. 1111 Fol. 494	19/7/1948	Commonwealth of Australia
Vol. 1254 Fol. 870	28/11/1961	Commonwealth of Australia
Vol. 1726 Fol. 299	24/4/1986	Commonwealth of Australia
Vol. 1813 Fol. 203	16/8/1988	Commonwealth of Australia
Vol. 1852 Fol. 601	22/8/1989	Commonwealth of Australia
Vol. 2124 Fol. 980	02/07/1997	Commonwealth of Australia

The title information indicated that the Site was privately owned prior to 1925. Between 1925 and the early 1940's the Site was likely utilised for market gardens and farming (livestock grazing). The Commonwealth of Australia purchased the land in 1944 when the Perth Airport was established.

4.2 Dangerous Goods Records

A freedom of information request pertaining to the dangerous goods storage registered to Perth International Airport was submitted to the Western Australia Department of Mines and Petroleum (DMP). The information received from the DMP confirms that no records of the storage of PFAS containing substances have been documented within Dangerous Goods records.

The records confirm the presence of underground fuel storage tanks (UST) at current and former Airservices leased parcels of land or buildings. Fuel storage facilities exist (or previously existed) at the current and former ARFF Fire Stations, the former Maintenance Centre (Workshop and Tyre Centre), Fire Training Grounds in the Airport North area and at all leased areas associated with airport navigational facilities, including the control tower. Aside from ARFF related facilities, these fuel storage elements are anticipated to exist for supplying back-up generators to maintain airport operability in the event of electricity supply failure.

4.3 Contaminated Sites

The Western Australia Department of Environment Regulation (DER) Contaminated Sites Database showed only one lot within the Site was registered on the Database. Lot 13575 Abernathy Road, Forrestfield, WA, 6058 is classified as '*Remediated for Restricted Use*'. The reasons for classification are associated with copper, zinc and total nitrogen impacts in groundwater, as well as the potential presence of asbestos containing materials (ACM) within site soils.

A 'Basic Summary of Records' information request was submitted to the DER Contaminated Sites Branch for Lot 100 Plan 6619 (which includes the majority of the northern half of the Site). In response, the DER confirmed in writing that no records are held by them for this land parcel due to it being located on Commonwealth land and not within the remit of the WA Contaminated Sites Act 2003.

Results of the Contaminated Sites Database search and records and responses received from the DER are included in **Appendix D**.

4.4 Airport Environment Site Register

PAPL has measures in place to prevent contamination in compliance with the Airport Environmental Regulations (1997). PAPL maintains an Environment Site Register, monitors and reports annually on all known sites of soil contamination and collaborates with tenants in the remediation of known contaminated sites.

The Perth Airport Annual Environmental report (2013/2014) identified nine known contaminated sites within the airport, which are currently being managed and/or remediated. These are recorded as:

- Airservices Australia – AFFF contamination associated with firefighting training activities
- Former Shell Service Station, Brearley Avenue – hydrocarbons in soil and groundwater
- Joint Operations Fuel Storage Facility – phase separated hydrocarbons associated with degraded diesel
- Gateway WA Project – Construction works near runway detected inert wastes including asbestos
- T1/T2 Car Park Construction (Horrie Miller Drive and Hudswell Road) – Asbestos contained within older infrastructure
- Helicopters NZ Australia (Airside, General Aviation) – residual soil and groundwater contamination from a jet fuel spill
- McComb Road Fuel Facility (McComb Road) – hydrocarbons in soil and groundwater
- Perth Mint Gold Refinery (Horrie Miller Drive) – potential heavy metal contamination in groundwater
- Qantas Underground Fuel Tanks (Airside, Domestic and International Terminals) – potential hydrocarbon contamination in fuel storage areas.

4.5 Historical Aerial Photographs

The following tabulated information is summarised from the review of historical aerial photographs for the Site and surrounding land areas. The aerial photographs were obtained from Landgate and are included in **Appendix E**.

Table 5 Aerial Photograph Review

Photo Details	Description
November 1953 Black and White Appendix E – Figure 1	Airfield - Three main runways are evident and appear to be serviced by taxiways to the current T3/T4 terminal area - All of the runways are shorter than their current layout and earthworks for extension of both north-south and northeast-southwest runways is in progress - The road now known as Maida Vale Road traverses the airport south of the shown extent of the main north-south runway, whereas Maida Vale Road now only exists east of the current Airport Estate extent - The location of the Former Fire Station is vacant, with no discernible facilities present Airport North - The area to the north of the runway is mostly cleared of vegetation to an open bushland state, with several vehicle tracks throughout - The Northern Main Drain is evident Airport East - Munday Swamp is discernible, as well as three further areas that appear to be low-lying wetland areas in the south of the Airport East area - The area appears to be mostly undeveloped pasture and bushland, with several minor roads or tracks cutting across the southeast Airport Central - The area appears to be mostly cleared for pasture - The early reaches of the Northern Main Drain are visible - Maida Vale Road passes through Airport Central in an east-west direction - A few minor buildings are located in the area currently southeast of present-day T1/T2 facilities and now occupied by parking areas Airport South - The area is mostly cleared but otherwise undeveloped - Several darker areas in the photograph are interpreted to represent low-lying ground and wetland areas. These run east-west and are a likely forerunner to the present-day Southern Main Drain feature Airport West - The east-west oriented runway is located in the north of the 'Airport West' area - The area now occupied by the domestic T3/T4 facilities appears to be in the early stages of development with numerous roads visible - The majority of the area south of this is open bushland with some access tracks and roads crossing, including the Maida Vale Road arterial road
March 1965 Black and White Appendix E – Figure 2	Airfield - The main runway has been extended to the south and has bisected the former Maida Vale Road - The former ARFF Station and Air Traffic control tower were constructed by 1965 - Additional taxiways are apparent to the west of the Former Fire Station and service the western terminal aircraft docking areas - Development was occurring to the south of the domestic terminal which appears to be related to the fuel facility, with two ASTs apparent Airport North - An area of additional clearing northeast of the airfield, and an alignment of clearance extending northwards from this point, shows the freight rail-line development occurring Airport East - No significant changes in the Airport East area are noted since the previous 1953 aerial photo Airport Central - The Northern Main Drain remains evident - Patches of potential wetland areas in the prior photo appear absent, perhaps drained or filled, although noting that the 1965 photo shows post-summer conditions (March) whereas the 1953 photos shows post-winter / autumn conditions (November) - An increased number of tracks exist in the north of the area and further vegetation clearance and building construction has occurred elsewhere Airport South - The area remained undeveloped bushland with access tracks apparent - An open area of bare ground has appeared in the centre of the area Airport West - Brearley Drive and the T3 & T4 terminal areas are now well established with the terminal apron, terminal buildings and carpark area clearly visible - Hangar facilities and an asphalt apron exist to the south of the terminal facilities - Other smaller hangars are developed northwest of the main T3/T4 buildings - More roads have developed west of the Terminal and from Brearley Drive, although the majority of land south of Brearley Drive remains rural

Photo Details	Description
September 1974 Black and White Appendix E – Figure 3	Airfield - The main north-south runway is again extended further to the south - Some additional road or taxiway development had occurred near the former ARFF Station Airport North - The area remains mostly in low bush/scrub-land with some rural fields - The freight rail line now fully extends through the Airport North area (and continues south as in its present day alignment) - Kalamunda Road is now formed - The industrial area located offsite to the northeast is significantly further developed than in the previous photo Airport East - Two sets of buildings have been constructed near the eastern boundary of Airport East - The freight rail lines and rail yards are now constructed beyond the eastern boundary of the area - Exposed areas of earth-works in the north of the area (immediately southeast of Munday Swamp) suggest excavation/borrow pits or imported soil mounds, potentially associated with the significant neighbouring rail-corridor works - Several cleared areas also exist in the south of the Airport East area, with the one furthest south appearing to be formed of stockpiles - On the alignment of an access track in previous photos, the Southern Main Drain is now formed through the south of the area and runs through the Airport Central Area and into the Airport West area, before turning north Airport Central - Additional access tracks and a shelter or small building are noted in the north of the Airport Central area, immediately north of the present day T1/T2 complex and corresponding with an area anecdotally used for annual fire training events until 1980's - More access roads, additional clearing and the Southern Main Drain are notable in the south of the area Airport South - Little change has occurred other than the establishment of the Southern Main Drain crossing the north of the area and some further clearing to the south including around the horse training track. Airport West - The curved alignment of the present day Tonkin Highway location appears to have developed to the south west of the airport - The Southern Main Drain is formed and runs up the western boundary of the Airport West area and west of the developing industrial areas before aligning with Brearley Drive - The T3/T4 terminal areas have undergone further development and incorporate additional terminal / hangar buildings and larger apron areas - More commercial / industrial development is apparent west and southwest of the terminal facilities - To the south of the T4 building a service station or fuel depot was apparent with a typical 'T' shaped canopy visible - A black area south west of the T4 building is interpreted to be the water storage dam that is used to the present day for irrigation supply - A hangar building was apparent north west of the terminal apron - Residential developments to the west, between the Airport and the Swan River continue to increase in density
June 1985 Colour Appendix E – Figure 4	Airfield - The former ARFF Station appeared similar to the 1974 aerial photograph - Further apron and taxiway extensions are noted - Further extension of the main north-south runway has occurred with the runway now passing over the Southern Main Drain (constructed culvert) Airport North - The circular FTG is noted for the first time - Two other buildings or facilities are also noted for the first time northeast of the FTG area, one being the Airport incinerator on the northern boundary - Aside from the establishment of several access tracks to and between these new elements, no other significant change in the Airport North area is noted Airport East - Abernathy Road and freight rail sidings and facilities are now fully established beyond the eastern boundary - Aside from some minor additional clearing and disturbance in the south, no other significant changes are noted Airport Central - Horrie Miller Drive is formed and the present day (International) Terminal 1 complex appears to be under construction - South of the terminal building exposed earthworks lie where carparks and the new Air Control Tower are subsequently developed - Multiple tracks and earthworks areas also remain north of the T1 construction area Airport South - Horrie Miller Drive now bisects the Airport South area in a north-south orientation - Beyond the roading earthworks areas, the area remains largely undeveloped and covered in grass or scrub Airport West - The T3 & T4 terminal areas have been extended - An increase in commercial industrial development within vicinity of the former maintenance building s north of Brearley Drive is apparent - Further warehouse and industrial development is also notable south of Brearley Drive with two rectangular shaped buildings noted west of the dam - Additional hangar buildings have been developed north west of the main terminals - To the south the area remains mostly in grass and scrub, but the southern section of what will eventually become Dunreath Drive is now formed between Tonkin Highway and the Airfield. This area contains several tracks and anecdotally was also used for firefighting training at some stage.

Photo Details	Description
February 1995 Colour Appendix E – Figure 5	Airfield - Extensions of the former ARFF Fire Station are noted in the form of roof line changes - New taxiways are constructed east of the main runway and service the now established International Terminal area - Other areas of runway resurfacing and taxiway widening throughout the airfield are apparent as darker areas of the bitumen Airport North - Aside from a few more access tracks no significant changes are noted within the Airport North area - It appears that a fire has recently occurred to the north of the road now known as the Great Eastern Highway Bypass Airport East - Photograph appears to show blackened vegetation south of Munday Swamp – potentially indicating a recent grass a scrub fire - Otherwise no significant changes from the 1985 aerial photograph Airport Central - The International Terminal (T1) is operational and the apron and eastern taxiway are established - The current airport control tower is built south of the Terminal - Two above-ground storage tanks are established, indicating the initial development of the BP Fuel farm facility - Bitumen carparks and landscaped areas south of the Terminal building are also established - Further roads and industrial / warehouse development has occurred to the east of Horrie Miller Drive - Airport Drive has been extended north but does not appear to yet connect into T1 carpark areas - Former access tracks and earthworks spoil areas north of the Terminal have been re-levelled and are grassed between the apron and Northern Main Drain - Remainder of the mid and southern sections of the Airport Central area remain largely unchanged from 1985 photograph Airport South - Initial commercial / industrial developments have commenced in the area, with some of the first buildings being those of the Perth Mint Refinery - Aside from these few buildings and the established infrastructure of Horrie Miller Drive and the Southern Main Drain, only minor tracks and roads exist in the area and no further developments of significance are noted Airport West - The concrete apron of T3 & T4 terminal areas appeared to have been extended - Some further development of commercial / industrial areas has occurred west of the Terminal buildings but more extensive paved carpark areas are the most significant feature of development in the ten years between 1985 and 1995 - No other significant changes are noted in the mid and southern sections of the Airport West area
May 2006 Colour Appendix E – Figure 6	Airfield - No significant changes to the former ARFF Fire Station from the 1995 aerial photograph - A cleared area or stockpiled materials, square in shape, is located east of the ARFF Station. - An additional taxiway has been constructed to connect into the International Terminal apron area (present day T1/T2 complex) Airport North - The additional facilities are now present in the immediate vicinity of the FTG (presumably the water treatment plant) - Development of Light Industrial units has occurred in the far east of the area Airport East - Grogan Road now bisects the Airport East area - Driver training centre now established between Grogan Road and Munday Swamp Airport Central - Additional apron areas and a second taxiway are established to the north of the International Terminal (T1) - Further infill of Industrial / warehouse buildings has occurred in proximity to Horrie Miller Drive and Airport Drive - Further development/expansion of the BP fuel Farm has occurred - Remainder of the mid and southern sections of the Airport Central remain largely unchanged from 1985 photograph Airport South - Commercial land redevelopment has commenced in the south, at intersection of Horrie Miller Drive and Tonkin Highway - Significant adjoining blocks are cleared and levelled and served by roads awaiting further development (now Hugh Edwards and Colquhoun Roads) Airport West - The T4 terminal apron has been extended and several taxiways have been infill-paved - Additional charter aviation operation buildings, hangars and apron areas are located north of the main public terminal facilities - The former Workshop and Tyre Store and surrounds appear unchanged from 1995 - Carparks to adjacent to the T3/T4 buildings have been extended to the south west - Large warehouse buildings have been constructed to the south west of the main Terminal area, one being the Perth Mail Centre

Photo Details	Description
February 2016 Colour Appendix E – Figure 7	Airfield - The former ARFF Fire Station has been removed and bitumen paving extensions to the taxiway and aprons surrounding the area have occurred - The new ARFF Fire Station is now located north of the runways, in its present day location - Additional taxiways and widening of existing taxiways has occurred throughout the airfield network - There is a considerable overall increase in paved airfield areas (including aircraft standing areas and extended Terminal aprons - see Central and West) Airport North - FTG fire training pad modifications are notable with a new concrete pad visible and water treatment plant to the west - Increased industrial development to the north east, most notably the development of the brickworks between Kalamunda Road and the freight rail-line Airport East - Significant warehouse and industrial development south of Grogan Road - The southern portion of the area remained as undeveloped bushland with dirt tracks and areas of exposed sand apparent Airport Central - The additional domestic terminal (T2) has been constructed and significant additional apron paving now surrounds the T1 and T2 areas - The main eastern taxiway has been extended to the south - Large areas of long-term parking and other bitumen storage yards are now developed east of Airport Drive and throughout the entire precinct south of the terminal areas, significantly increasing the proportion of paved areas - Horrie Millar Drive has been upgraded and includes new roundabouts - Airport Drive has been developed and now links into the new Tonkin Highway interchange in the southwest of the area Airport South - Nearly the entire Airport South area now in commercial / industrial developments notably including Woolworths and Coles warehouse / distribution centres - Very north of the area extends into carpark area of Airport Central and a section on the eastern edge of the area remains in open scrub - The SMD appears is either alternately channelized through the area or culverted beneath some industrial developments, although several surface water retention ponds are noted throughout the developed and now mostly paved precinct Airport West - Charter aviation facilities to the north have extended further north and more paved area exists near those hangars - More taxiways and apron areas also now exist immediately north of the T3/T4 terminal complex - The commercial and industrial areas and carparks east of the T3/T4 complex have infilled, with significantly greater parking areas now constructed - The southern portion of the area remains predominantly bushland with cleared areas of exposed sand and access tracks apparent - Realignment works of Dunreath Drive provide access to a new viewing area, west of the southern end of the main runway

4.6 Previous Environmental Investigation or Compliance Reports

AECOM is aware of the following reports relating to environmental investigations, which hold potential relevance to Airservices operations within the Site:

- QED (2007) Ground Water and Soil Quality Testing, Fire Training Facility, Perth Domestic Airport, May 2007.
- QED (2008a) Ground Water and Soil Quality Testing, Fire Training Facility, Perth Domestic Airport, January 2008.
- QED (2008b) Soil Quality Assessment, Fire Training Facility, Perth Airport Western Australia, August 2008.
- GHD (2008) Report for ARFF National Testing Program, Preliminary Site Contamination Assessment, Perth ARFF Drill Ground, Perth Airport, August 2008.
- QED (2008c) Ground Water and Soil Quality Testing, Fire Training Facility, Perth Domestic Airport, November 2008.
- QED (2009a) Ground Water and Soil Quality Testing, Fire Training Facility, Perth Domestic Airport, July 2009.
- QED (2009b) Ground Water and Soil Quality Testing, Fire Training Facility, Perth Domestic Airport, October 2009.
- QED (2009c) Industrial Discharge Water Quality Testing, Fire Training Facility, Perth Domestic Airport, October 2009.
- AECOM (2011) Environmental Site Assessment, Former Aviation Rescue and Fire Fighting Station, Perth Airport, September 2011.
- AECOM (2012a) Concrete and Bitumen Categorisation, Former ARFF Station, Perth Airport, February 2012.
- AECOM (2012b) Groundwater Management Plan – Former ARFF Station, April 2012.
- AECOM (2013) Environmental Site Assessment, Former Mechanical Workshop and Former Tyre Store, Perth Airport, January 2013.
- QED (2013a) Industrial Discharge Water Quality Testing, February 2013.
- QED (2013b) Ground Water and Soil Quality Testing, Fire Training Facility, Perth Domestic Airport, February 2013.
- QED (2013c) Soil and Ground Water Quality Assessment, Perth Domestic Airport, October 2013.
- QED (2014a) Soil and Ground Water Quality Assessment, Perth Airport, Mock up Hot Fire Training Facility, September 2014.
- QED (2014b) Soil Investigation Pond Overflow, Fire Training Facility, September 2014.
- QED (2014c) Industrial Discharge Water Quality Testing, Fire Training Facility, Perth Domestic Airport, September 2014.
- AECOM (2015a) Perth Fibre Optic Project, Phase 1 Environmental Site Assessment, May 2015.
- AECOM (2015b) Perth Fibre Optic Route, Limited Phase 2, May 2015.
- QED (2015) Ground Water Quality and Soil Assessment, Perth Airport Fire Training Grounds, September 2015.
- CM (2015a), Quarterly Surface and Groundwater Sampling Report, October 2015;
- CM (2015b), Quarterly Surface and Groundwater Sampling Report, December 2015; and
- CM (2016) Quarterly Surface and Groundwater Sampling Report, March 2016.
- AECOM (2017d), Monitoring Event Report, Perth Airport Current Fire Training Ground, November 2017.

Table 5 below summarises key aspects and findings made within these reports. A further summary of findings is provided in **Figure F-1** of **Appendix F**, which indicates locations in which PFAS have been detected in soil and/or groundwater samples.

It must be noted that the analytical Limits of Reporting (LOR) for PFAS substances have varied over the period of reporting spanned by the documents summarised below. Similarly, environmental and health risk assessment Guidelines referenced in the individual reports are not consistent. Where statements regarding analytical LOR or Guidelines are made, these are statements specific to the analytical limits and guidelines adopted by the specific report being referenced.

Table 6 Summary of Historical Reports

Report	Sample Date	Airport Estate Area	Sampling Information	COPCs	Report Summary/ Comments
QED - Ground Water and Soil Quality Testing, Fire Training Facility, 2007	January, 2007	Fire Training Area and Old Incinerator Building – Airport North	3 monitoring wells, 5 sediment samples.	TRH, BTEX, MBAS and non-ionic surfactants	TRH and BTEX were below the LOR in all groundwater and soil samples with exception of one groundwater and one soil sample. MBAS surfactants were detected above the LOR in all groundwater and soil samples. Non-ionic surfactants were only detected above the LOR in soil samples.
QED - Soil Quality Assessment, Fire Training Facility, 2008a	January, 2008	Fire Training Area and Old Incinerator Building – Airport North	3 monitoring wells, 5 soil samples.	TRH, BTEX, MBAS and non-ionic surfactants	TRH was detected in one of the three groundwater samples, and one of the five soil samples. BTEX was not detected above the LOR in any sample. MBAS surfactants were detected in all samples. Non-ionic surfactants were detected in one of the five soil samples.
GHD – Preliminary Site Contamination Assessment, Perth ARFF Drill Ground, 2008	July, 2008	Fire Training Area – Airport North	14 soil samples from 3 boreholes, and 2 sediment samples and 3 wells.	TPH, PAHs, PFOA and PFOS.	PAHs and TPH in soil were not detected with exception of one sample that possessed TPH above the LOR. One of the two sediment samples was identified to contain PFOA (3.2 mg/kg) and PFOS (1.5 mg/kg). TPH and PAHs were not detected in groundwater samples. PFOA (4.2 – 17 µg/L) and PFOS (22 – 380 µg/L) were detected in all three primary groundwater samples collected.
QED - Ground Water and Soil Quality Testing, Fire Training Facility, 2008b	August, 2008	Fire Training Area – Airport North	4 soil samples from a trench, 1 background sample.	TRH, BTEX, MBAS and non-ionic surfactants	TRH was detected in one soil sample. MBAS surfactants were detected in all soil samples above the LOR. BTEX was not detected in any sample.
QED - Ground Water and Soil Quality Testing, Fire Training Facility, 2008c	November, 2008	Fire Training Area – Airport North	3 monitoring wells, 1 surface water, 4 sediment samples.	TRH, BTEX and MBAS	One groundwater well and one surface water sample possessed TRH and BTEX concentrations above the LOR. MBAS was detected in all samples.
QED - Ground Water and Soil Quality Testing, Fire Training Facility, 2009a	July, 2009	Fire Training Area – Airport North	One pond water sample.	TRH, BTEX, heavy metals, physical parameters, oxygen demand	TRH was detected above guideline criteria. BTEX and heavy metals were detected above the LOR but below guideline criteria.
QED - Ground Water and Soil Quality Testing, Fire Training Facility, 2009b	October, 2009	Fire Training Area – Airport North	3 monitoring wells, one surface water sample and six surface soil samples.	TRH, BTEX and MBAS	MBAS surfactants were detected above the LOR in all soil samples. TPH and BTEX were reported below the LOR in all soil samples. Copper, lead, zinc, MBAS surfactants were detected above the guideline criteria in all samples. TPH was detected in two of the three groundwater wells.
QED - Industrial Discharge Water Quality Testing, 2009c	October, 2009	Fire Training Area – Airport North	One pond water sample.	TPH, BTEX, heavy metals, physical parameters, surfactants	pH fell outside the accepted range of guideline criteria. BTEX and PFOA and PFOS were detected above the LOR while TPH was detected above guideline criteria. Some metals were detected above the LOR but not exceeding guideline criteria.
AECOM - Environmental Site Assessment, Former Aviation Rescue and Fire Fighting Station, 2011	June, 2011	Former ARFF Station – Airport West	31 boreholes, 21 monitoring wells, 8 sediment samples, 12 crushed concrete samples, 7 concrete swab samples, 3 surface water samples and 2 leachate samples.	TPH, TRH, BTEXN, OC/OP, PAH, Phenols, PCB, MBAS, PFOA and PFOS	Soil concentrations of PFOS were detected at 63 out of the 88 locations, and PFOA was detected at 27 of the 88 locations. MBAS was reported above LOR at 10 of the 12 sampled locations. Concrete and sediment concentrations reported PFOS in all samples. Lead concentrations exceeded groundwater guideline criteria in one sample. PFOS, PFOA & MBAS in all groundwater samples. Concentrations of PFOS detected in all 3 samples, PFOA in 2 of 3 samples.
AECOM - Concrete and Bitumen Categorisation, Former ARFF Station, 2012a	December, 2011	Former ARFF Station – Airport West	17 crushed concrete, bitumen or concrete swabs.	PFOA, PFOS and 6:2 FtS	PFOA, PFOS and 6:2 FtS detected in all samples.
AECOM - Groundwater Management Plan, Former ARFF Station, 2012b	June, 2011	Former ARFF Station – Airport West	22 monitoring wells,	PFOA, PFOS and 6:2 FtS	PFOS found in all groundwater wells and PFOA in 18 of the wells.
AECOM - Environmental Site Assessment, Former Mechanical Workshop and Former Tyre Store, Perth Airport, January 2013	January and June, 2011	Former Mechanical Workshop and Former Tyre Store – Airport East	17 soil boreholes, 17 monitoring wells, four sediment samples, one crushed concrete sample, one concrete swab sample, two surface water samples.	TPH, BTEX, PAHs, metals, physical properties, MBAS surfactants, PFOS, PFOA, PCBs and OC/OP pesticides.	TPH, BTEX, metals, OC/OP pesticides, and PCB were not identified above the LOR and guideline criteria for any sample. PFOS was detected in 44 of the 63 samples analysed, PFOA in five of the 63 samples. No PFOS or PFOA concentration exceeded the adopted guideline criteria. PFOS in concrete and sediment samples were identified above the adopted criteria. MBAS surfactants were reported in only one of the four samples analysed. BTEX compounds were not identified in groundwater samples however TPH was identified in two samples.

Report	Sample Date	Airport Estate Area	Sampling Information	COPCs	Report Summary/ Comments
QED - Industrial Discharge Water Quality Testing, February 2013a	February, 2013	Fire Training Area – Airport North	One surface water sample.	TPH, BTEX, heavy metals, physical parameters & surfactants.	TPH, BTEX, PFOA, PFOS and 6:2 FtS were detected.
QED - Ground Water and Soil Quality Testing, Fire Training Facility, Perth Domestic Airport, February 2013b	February, 2013	Fire Training Area – Airport North	Three monitoring wells, four soil samples and one surface water sample.	TPH, BTEX, heavy metals and surfactants.	TPH and BTEX were not identified in any soil samples. Minor concentrations were present in three of the four samples but did not exceed guideline criteria. TPH was detected above the LOR in two groundwater samples and MBAS surfactants detected above the LOR in all groundwater samples. BTEX was reported below the LOR in all samples.
QED - Soil and Ground Water Quality Assessment, Perth Domestic Airport, October 2013c	October, 2013	Fire Training Area – Airport North	Three monitoring wells and four surface soil samples.	TPH, BTEX, heavy metals, MBAS surfactants, physical parameters.	TPH was detected above the LOR in two of the three groundwater monitoring wells. MBAS surfactants were detected in all groundwater samples. BTEX was not identified. Copper and zinc exceeded guideline criteria in one soil sample. All other analytes were not detected above the LOR in remaining soil samples.
QED - Soil and Ground Water Quality Assessment, Mock up Hot Fire Training Facility, 2014	September, 2014	Fire Training Area – Airport North	Three monitoring wells and four surface soil samples.	TPH, BTEX, heavy metals, MBAS surfactants, physical parameters, PFOS and PFOA.	TPH and BTEX were not identified in soil samples. PFOA and PFOS were detected at concentrations greater than adopted guideline criteria. Zinc and TPH exceeded the guideline criteria in one of the three groundwater samples. PFOS and PFOA were detected in all three primary samples and exceeded the adopted groundwater criteria.
QED - Soil Investigation Pond Overflow, Fire Training Facility, 2014	September, 2014	Fire Training Area – Airport North	Six soil samples from boreholes	Metals, TPH, BTEX, MBAS surfactants, PFOS and PFOA.	TPH was detected at concentrations exceeding guideline criteria in one of the six samples. PFOS and PFOA were identified in all three samples analysed for PFAS. MBAS surfactants were not identified.
QED - Industrial Discharge Water Quality Testing, Fire Training Facility, 2014	September, 2014	Fire Training Facility – Airport North	One waste water discharge sample	BTEX, TPH, heavy metals, MBAS, PFOA, PFOS, nutrients, cyanide, surfactants.	PFOS and PFOA were detected above adopted guideline criteria. TPH and BTEX were detected above the LOR but not exceeding guideline criteria.
AECOM - Perth Fibre Optic Route, Limited Phase 2, 2015	March, 2015	Fire Station, Fire Training Area – Airport North and offsite	82 soil samples from shallow boreholes.	PFOS, PFOA and 6:2 FtS	Five of the 82 soil samples (three located within the Airport) contained concentrations of PFOS and PFOA above the LOR.
AECOM - Perth Fibre Optic Project, Phase 1 Environmental Site Assessment, 2015	No samples collected	Fire Station, Fire Training Area - Airport North	Not applicable	Not applicable	The temporary storage of AFFF impacted material and for firefighting training was identified during the Phase 1 investigation to have the potential to impact soil and groundwater.
QED - Ground Water Quality and Soil Assessment, Perth Airport Fire Training Grounds, 2015	September, 2015	Fire Training Area – Airport North	Three monitoring wells, four surface soil samples.	Moisture, pH, TPH, BTEX, heavy metals, MBAS surfactants, PFOA and PFOS.	TPH was only identified in one monitoring well. Surfactants and PFOS and PFOA were identified in all three wells sampled. PFOS and PFOA were reported above the guideline criteria. Copper and zinc exceeded guideline criteria in one sample each. TPH in soil was detected above the LOR in one of the three samples. PFOS and PFOA as detected in all soil samples with concentrations exceeding the guideline criteria.
CM - Quarterly Surface and Groundwater Sampling Report, 2015;	October, 2015	Entire Airport Estate	16 surface water and 12 groundwater samples	Nutrients, Heavy metals, TRH, TPH, BTEXN, PFOS and PFOA.	TRH and BTEXN concentrations were reported below LOR for all samples analysed. Exceedances for heavy metals (Aluminium and zinc) and nutrients were noted. 13 samples reported concentrations of PFOS and PFOA.
CM - Quarterly Surface and Groundwater Sampling Report, 2015	December, 2015	Entire Airport Estate	16 surface water and 23 groundwater samples	Nutrients, Heavy metals, TRH, TPH, BTEXN, PFOS and PFOA.	Concentrations were reported below LOR for TRH and BTEXN, with the exception of a few results slightly above LOR for TRH >C16-C34 fractions. Exceedances for heavy metals (Aluminium and zinc) and nutrients were noted. 24 samples reported concentrations of PFOS and PFOA.
CM - Quarterly Surface and Groundwater Sampling Report, 2016.	March, 2016	Entire Airport Estate	13 surface water and 10 groundwater samples and 26 reticulation bores	Nutrients, TPH, TRH, BTEXN, heavy metals and AFFF suite of compounds.	TRH and BTEXN concentrations were reported below LOR for all groundwater and surface water samples analysed. Exceedances for heavy metals (Aluminium and zinc) and nutrients were noted. 15 groundwater and surface water samples were reported to contain detectable concentrations of PFOS and PFOA. 21 of the 26 reticulation bores were found to contain detectable PFAS compound concentrations.
AECOM - Monitoring Event Report, Perth Airport Current Fire Training Ground, 2017d.	October, 2017	Current Fire Training Ground	4 sediment samples and 4 groundwater samples	PFAS, TRH, BTEXN, PAH and MBAS	PFAS detected in all sediment samples. 8:2 Fluorotelomer sulfonic acid criterion exceeded in one sample (GHD, 2015 EIL – Commercial and Industrial land use at 60% protection, low reliability). PFAS detected in all groundwater samples, with criteria exceedances in all samples. Petroleum hydrocarbons in sediment and groundwater did not exceed the relevant criteria.

4.7 Historical AFFF Use

Based in information provided by Airservices only two PFAS-containing AFFF products were historically used by ARFF operations at the Site:

- 3M Light Water™ AFFF (PFOS based surfactant) FC-206CF 6% (approximately 1978 – 2000)
- ANSUL Ansulite 6% AFFF (Formula 1559-22 ICAO-B) (approximately 2000 – 2010)

Replacement firefighting foam which remains in use is Solberg Re-Healing Foam (RF) concentrates, which do not contain PFAS.

During the period that PFAS-containing AFFF products were stored and/or used on the Site by ARFF services, the following activities had the potential for AFFF to be released to the environment:

- Fire training activities
- Firefighting and incident responses
- Petroleum hydrocarbon spills and subsequent fire-prevention
- Maintenance of firefighting infrastructure, including washing and testing of fire-equipment tenders and the draining and drying of hoses employed to discharge AFFF
- Potential releases and/or spillages from infrastructure or during transfer of AFFF from Intermediate Bulk Containers (IBCs) or storage tanks to fire-fighting equipment.

ARFF operations have or continue to be delivered from the areas where AFFF was previously used, as described in further detail in **Sections 4.7.1 to 4.7.6** below and as identified in the attached **Figure 3**.

It is noted that other stakeholders at the Site may have used AFFF products; however assessment of this was beyond the scope of this investigation.

4.7.1 Former Mechanical Workshop and Tyre Store (Airport West)

The former mechanical workshop and former tyre store comprised two sheds, with the smaller one used to house large truck tyres. The two sheds are approximately 15 x10 m and 5 x10 m in floor dimension and are located within the airport maintenance depot. Firefighting tenders and equipment were serviced within the mechanical workshop. The tyre store housed 240 L drums on bunds containing various chemicals including oil, coolant and foam (AECOM, 2013a). At present, both buildings are vacant.

ARFF related operations were conducted at the workshop, including the storage and washing of tenders and equipment which contained AFFF. Concentrations of PFAS compounds have been detected in soils, concrete, groundwater and surface water at this location (AECOM, 2013a).

4.7.2 Former Aviation Rescue and Fire Fighting Station (Airport West)

The former ARFF Station and associated control tower building were constructed in the 1960's. The control tower which formed part of the site was vacated in 1987 and the former ARFF Station was vacated in 2010, when the current ARFF Fire Station was commissioned. The sub-lease associated with this area was surrendered to accommodate the expansion of taxiways and the construction of A380 aircraft parking areas, which began in late 2010 when the former ARFF station was demolished (AECOM, 2011d).

The former ARFF Station comprised:

- Main building including offices, amenities, store rooms etc.
- Control tower, attached to the main building
- Fire tender parking area (covered carports and maintenance areas)
- Chemical storage compound
- Wash down area, hose washing trough and drying rack

Operations conducted at the Former Fire Station included the storage and washing of tenders and equipment that contained AFFF and the storage of AFFF. AFFF impacts to soil, sediment, groundwater, surface water and concrete resulted. Following the relocation of ARFF facilities, all Fire Station infrastructure was demolished and removed from the area. Materials excavated during the demolition of these facilities remain stored in HDPE containment cells east of the current Fire Station (AECOM, 2011d).

4.7.3 Firefighting Training Ground and Associated Buildings (Airport North)

The Firefighting Training Ground (FTG, also formally known as the Firefighting Drill Ground) was vacant land prior to its construction approximately 35 years ago. The area was used for fire training exercises, including the use of kerosene, unleaded petrol and AFFF (mainly 3M Light Water™) (GHD, 2008). As well as being used for fire training activities by the Perth Airport ARFF, regional WA airport ARFF personnel also train at the Perth FTG. WA training activities were centralised to Perth by Airservices in 2008.

A two storey building is located in the south west of the FTG, used for smoke training. A fully bunded LPG tank located next to this building is used for training exercises on the mock gas tank area. The separate Incinerator Buildings were leased by Airservices from 1995, for an undetermined period (at least three years) and are located on the northern boundary of the Airport, to the northeast of the main FTG facilities.

Fuel storage facilities associated with the FTG were reported by GHD to include a 5,000-L Kerosene AST and 5,000-L Liquefied Petroleum Gas (LPG) AST (GHD, 2008). DMP Dangerous Goods records suggest the historic presence of a larger 20,000-L Diesel Fuel UST and potentially refer to the same LPG AST installation (although recorded as a 4,300 kg vessel).

The FTG comprises a fire training plane and training helicopter which sit on top of a concrete pad, surrounded by bunds constructed from stockpiles of fill material and gravel groundcover. A treatment pond (which is approximately six inches deep and has a skimmer), receives runoff from the concrete pad. The pond is designed to collect the foam in the water runoff and allow the hydrocarbons to evaporate. The pond has been refurbished once. The top layer of liquid in the treatment pond is collected and passed through an oil separator, and then flushed into an enclosed reservoir (which forms part of the oil separator) before being discharged into the sewer under a waste permit. During rainfall events, runoff from the concrete pad is passed through a micro filter, before being discharged into the nearby drain (GHD, 2008).

A treatment pond overflow event occurred in September 2014 due to a faulty pump. PFOS/ PFOA impacted soil was detected in subsequent investigations of the spill area and recommendations were made to excavate the affected materials. (QED, 2014b). Based on information provided by Airservices the material was placed into drums, stored under cover at the FTG, and later removed from site by a licensed waste contractor.

There is a bitumen laydown area used for the storage of used materials to the east of the ARFF station access track. This has included; piles of scrap metal and tyres as well as sea containers (AECOM, 2015a). Within the north east of the FTG there were additional stockpiles of soil.

4.7.4 Current ARFF Fire Station (Airfield)

The new Fire Station was constructed in the central northern part of the Airport and is located on the southern side of the Northern Perimeter Road and Limestone Creek. Airservices relocated ARFF operations to this location in 2010, after the former fire station was demolished (AECOM, 2015a). AFFF has not been used in ARFF activities by Airservices since 2010. Interviews with the ARFF Station Manager and Fire Commander indicate no AFFF has been used by the ARFF since relocation of the Fire Station in 2010,

Two High Frequency (HF) antennas and an associated equipment building and a Surface Movement Radar (SMR) are located north of the taxiway near the Fire Station. It is understood that no fuel is stored within the equipment building (AECOM, 2015a).

4.7.5 Other Suspected Firefighting Training Areas (Airport West, Airport Central)

Information from Site interviews suggests that other areas on the Airport may have been used for fire training or drills historically and may have involved the release of AFFF. These areas include:

- An area north of the current T1/T2 complex (now partially sealed over by the T1 apron), which based on anecdotal information may have been used infrequently in the late-70's / early-80's prior to Airservices creation in 1995, as evidenced by an aerial image provided by PAPL dated 1983, showing a mock-up burned out vehicle. This is likely to have been used as a fire training area before the current FTG was built and is referred to as 'Former Fire Training Area A' in **Figure 3**.
- An area near the western airport boundary and immediately north of the present-day public viewing area was reportedly used for joint training exercises between ARFF and municipal Department of Fire and Emergency Services (DFES) brigades. This area is referred to as 'Former Fire Training Area B' in **Figure 3**. The timeframe for use of this area is not known.

Neither of these areas has previously been investigated specifically for AFFF impacts.

4.7.6 Fire Suppression Activities

Firefighting incidents at the Site to which the ARFF services have responded are presented in **Table 7**. This incident log provides a means of estimating approximate AFFF volume discharged during firefighting incidents. The log covers a reporting period of 1998 – 2010 and therefore does not cover the entire period in which AFFF may have been used in incident responses at the Airport. Copies of the incident reports are provided in **Appendix G**.

Table 7 AFFF Incident Usage

Airservices Incident #	Incident Location	Airport Area	Incident Details	Date	Approx. Vol. of Foam (L)
219	International Terminal Bay 51	Airport Central	A 280L fuel spill within a 560m ² area from a South African Airlines Aircraft.	02/01/1998	150
541	Ansett Terminal Bay 14	Airport West	A 250L fuel spill from the port wing vent of the aircraft	29/8/1998	40
803	International Terminal Bay 52	Airport Central	A 38L unleaded fuel spill from "...an Ansett Tug".	23/02/1999	88
1491	R/W 21 (Unclear where AFFF applied)	Airfield	A Skippers Airlines aircraft landing incident along runway.	7/09/2000	46
1552	Hangar 2 (Skippers Airlines)	Airport West	Fuel was observed running down the side of the port wing of an aircraft undergoing maintenance in a hangar	07/10/2000	30
1615	International Terminal Bay 54	Airport Central	A fuel spill during refuelling operations of aircraft (unknown volume of spill).	15/11/2000	150
1831	Australian Corrections Building (Detention Centre offsite)	Off-site	A fire in rubbish bin.	20/03/2001	10
1832	Australian Corrections Building (Detention Centre offsite)	Off-site	A fire in rubbish bin.	20/3/20001	9
1965	International Terminal Bay 54	Airport Central	A 100 Litre fuel spill from port wing of aircraft.	16/07/2001	200

Airservices Incident #	Incident Location	Airport Area	Incident Details	Date	Approx. Vol. of Foam (L)
2193	ANSETT Terminal Public Car Park	Airport West	A fuel spill from parked vehicle.	23/01/2002	50
3372	Off Site	Offsite	An off-site building fire.	23/07/2004	100
3585	DTB Carpark	Unknown	A motor vehicle accident in carpark.	08/12/2004	40
4163	Bay 55	Airport Central	A fuel spill from venting wing of QANTAS aircraft.	07/1/2006	10
4235	Mulch Producing site in the vicinity of Gate 8	Airport South	A fire in the mulch pile.	12/02/2006	40
4391	Taxiway D	Airport West	A fuel leak from a Skywest aircraft on taxiway.	17/05/2006	260
5642	International Terminal on Bay 53	Airport Central	Approximately 40 Litres of fuel spilled from aircraft.	20/02/2008	50
7959	Foxtrot Taxiway	Unknown	An aircraft engine fire from landing issue.	21/06/2010	141

5.0 Site Inspection and Stakeholder Engagement

A questionnaire was sent to both PAPL and ARFF representatives prior to the Site inspection and meetings to identify the potential Site uses and activities that could have led to AFFF releases and contamination concerns.

On 18 July 2016, [REDACTED] of AECOM and [REDACTED] of Airservices met with the following PAPL representatives;

- [REDACTED] (Manager Environment and Sustainability).
- [REDACTED] (Environmental Coordinator).

Separate interviews were also undertaken with the following staff of the Perth ARFF service:

- [REDACTED] (Fire Station Manager).
- [REDACTED] (Fire Commander).

During the site visit with the ARFF Station Manager a visual inspection of the airport and areas that might be impacted with PFAS were undertaken. A photo log of the Site inspection is provided in **Appendix H**. The areas of the Site that were inspected included:

- Fire Training Ground, Current ARFF Fire Station and Incinerator (Airport North)
- Soil Stockpiles and Northern Main Drain (Airport North and East)
- Runway, taxiways and location of former ARFF Fire Station (Airfield)
- T1 aprons and BP Fuel Farm (Airport Central)
- Former combined training area (Airport West – north of new public viewing area)
- Former maintenance building and surrounding industrial area (Airport West)

Several Airservices operations hold no association with the ARFF function and the following facilities form no part of this study:

- Operations Centre and Office
- Navigation Equipment and Office
- Current Air Traffic Control Tower.

5.1 Observations, Interviews and Anecdotal Information

Observations made during the Site inspection are summarised in **Table 8** below. The information provided in the discussions and during the Site inspections was largely anecdotal and, in most cases, has not been verified and should not be relied upon without substantiating further.

Table 8 Summary of Observations and Anecdotal Information

Observed Anecdotal Information		
#	Site Area	Detail
1	Fire Training Ground – Airport North	The FTG was inspected and a mock aircraft and helicopter were located on the central concrete pad. This pad was submerged by surface water and the ponded water presented a hydrocarbon sheen. A kerosene odour was noted in the area.
2	Fire Training Ground – Airport North	A drain directs runoff to the treatment/evaporation pond, which held standing water at the time of the inspection due to recent rainfall. Discharge appeared to be pumped to a mains sewer connection.
3	Fire Training Ground – Airport North	Burning fuel storage at the FTG included an AST located within a bund structure (at eastern boundary of FTG) and four waste drums containing waste aviation fuel (also located within the bund structure). A rusted gas AST was also observed and was reported to be empty.
4	Airport North	The Airport incinerator building was observed on the northern boundary.
5	Airport North and North Airport East	HDPE contained soil stockpiles generated from the former ARFF station were observed to the east of the current ARFF Fire Station.
6	South West Airport Central	A fire training area where combined ARFF and DFES had historically been undertaken was viewed from the public viewing area off Dunreath Road. The area is now covered in low bushland intersected by numerous off-road access tracks. No car bodies or the reported bus were observed.
7	Airport East	Larger stockpiles of soils, asphalt and concrete were observed along the eastern boundary and the origin of these was not known.
8	Airport South, Airport North and Airport East.	The Northern Main Drain and Southern Main Drain and several connecting drains were observed.
9	Airfield	Surface runoff drains were observed at edges of most taxiways and runways.
10	South of T4 Airport West	A large dam with bird netting placed over it was observed within the precinct adjacent to the Western boundary. This was identified as a storage and supply dam for irrigation water.
11	South of T2 - Airport Central	The BP fuel depot was noted to include three large ASTs. No close inspection of the fuel depot was made and the type of fire suppression / protection measures employed at the fuel farm facilities are not yet understood.
12	Northwest – Airport North and Airport west	Several aircraft hangars used by Virgin, Qantas, Cobham and Skippers were observed in the north west of the airport but not inspected in detail and no knowledge of fire suppression systems were available.
13	George Wjencke Drive – Airport West	The Former Workshop & Tyre Store area previously leased by Airservices was observed. The area was fenced and access was limited.

PAPL Representatives Comments		
#	Site Area	Detail
1	Perth Airport	Runoff and stormwater discharged offsite via the Northern and Southern main drains, as well as the drainage network on the western side of the site typically passes through triple interceptors prior to entering the main drainage networks.
2	Perth Airport	Waste water from the airport is directed to municipal sewer systems offsite.
3	Airport South (Southeast)	An old sewage dumping area was formerly sited to the south east of the airport. Possibly including a holding basin until up to 1983.
4	Perth Airport	The Airport were aware of three environmental reports pertaining to AFFF contamination and these reports were supplied by Airservices for the former maintenance area within the western precinct, the former ARFF Fire Station and the Fire Training Ground.
5	Perth Airport	PAPL representatives were unaware if AFFF had been used at other Airport locations (for example in hangar fire suppression systems, fuel depots etc.).
6	Airport West	In late 2015 the state fire service (Department of Fire and Emergency Services - DFES) used the cleared area of bushland in the southwest for training activities and it was not known if similar activities had previously occurred. Specifically there was no knowledge of whether DFES or combined DFES/ARFF activities had ever involved AFFF training in areas around the southern perimeters of the airport.
7	Perth Airport	Since October 2015 PAPL have analysed water samples for PFAS compounds on a quarterly basis and as part of routine groundwater and surface water monitoring events. These works have confirmed: • a relatively widespread distribution of PFAS compounds exists in groundwater and surface water • the highest concentrations of PFOS in groundwater were in samples collected from near the roundabout of Brearley and George Wjencke Drives • water samples collected from the Northern Main Drain sampling point contained PFOS/ PFOA concentrations above drinking water guidelines
8	Perth Airport	Perth Transport Authority (PTA) investigations associated with the Forrestfield Airport Link (FAL) project including sediment of the Southern Main Drain found no detectable PFAS concentrations in the sediment but did detect PFAS in groundwater and surface water. The FAL project incorporates significant tunnelled rail lines and during and after construction may interact significantly with local drainage.
9	Perth Airport	Groundwater is used for irrigation purposes (referred to as 'reticulation' water) and is not used for potable water supply. Water for irrigation is currently drawn from the surface water dam and approximately 15 abstraction-bores across the Airport.
10	Perth Airport / Airport North	An inner perimeter security fence was constructed approximately 4 years ago separating several functioning areas around the periphery of the airport including the FTG, Bureau of Meteorology, navigation stations and several other facilities.
11	Airport West	A carpark area near the former ARFF workshop/ maintenance building area formerly housed the 'Hooker Hangar' (used for aircraft maintenance) which was demolished in 2007-2008. PAPL intend to install an additional groundwater well in this area for monitoring purposes.
12	Airport West (George Wencke Drive)	Discussion was held in relation to another building located to the south west of the western industrial precinct, which was potentially leased by Airservices until 2009 when it was demolished and the site was cleared. Airservices () subsequently confirmed the building was associated with other Airservices functions and housed Navigational Equipment. No potential for AFFF related issues therefore exist at that site.
13	Off Site	Noted the potential for unregistered groundwater abstraction bores in residences and commercial premises located to the west of the airport.

ARFF Station Representatives Comments		
#	Site Area	Detail
1	Airport North, East, South	Areas to the northwest, northeast and southeast have undergone significant development as industrial estates.
2	Perth Airport	AFFF volumes used during training and incidents were manually recorded prior to 2006 but the archived records may no longer be available.
3	Airport North	No AFFF has been used by the ARFF since relocation of the Fire Station in 2010.
4	Airport North (FTG)	Fire training activities occurred within the FTG and in bushland to the North (near the airport radar) where AFFF was used from approximately 1980 – 2010.
5	Airport North (FTG)	Training at the FTG occurred at least once a week but potentially up to four times a week as there were four different shifts from 1980 – 2010.
6	Airport North (FTG) and Airfield	Potential volumes of AFFF used during training were not known, but fire trucks included Walter, Carmichaels, Mark 3, 5, and 6.
7	Airport North (FTG)	Combustible fuels used in training included kerosene and drums of waste from the airlines that may have contained thinners and hydraulic oils. Some such drums are still located within the bunded area of the FTG.
8	Airport North (FTG)	Waste water generated from the FTG concrete pad is directed to an evaporation and treatment facility that pumps excess water to the municipal sewer.
9	Airport North (south)	AFFF impacted soil, concrete and asphalt generated in the demolition of the former Fire Station are contained in HDPE covered/wrapped stockpiles, located east of the new Fire Station.
10	Airport West	Within the vicinity of 'Gate 6' there was an old bus and car wrecks that were less frequently used for fire training activities. These were used in annual combined emergency services training activities and AFFF foams may have been used.
11	Airport Central (south of current runways)	ARFF have been called upon to extinguish car fires when cars are dumped in bushland surrounding the airport and AFFF may have been used historically.
12	Airport West	Some AFFF was previously stored in the former maintenance facility (decommissioned in 2011 and now vacant) located within the western precinct.
13	Airfield (Western Boundary)	AFFF was used and sprayed during training activities at the Former ARFF Fire Station. During monthly maintenance on fire truck outlet valves, AFFF may have been released at the Former Fire Station
14	Airport West and Airport Central (Eastern boundary)	Fire suppression systems used by other stakeholders were not well understood (BP, Shell and Hangars).
15	Airport West (Western boundary)	AFFF was used to douse a tyre fire on the western boundary of the airport within the vicinity of the area now occupied by Tyre Power. However, this anecdotal evidence has not been substantiated with incident logs.
16	Off Site	It was stated that that ARFF attended two known offsite incidents where AFFF may have been used (unsubstantiated by incident log records): - Roe Highway fire to the north of the airport - Scrap heap fire on the corner of Collier Road and Tonkin Highways

6.0 Data Quality Objectives

The Data Quality Objectives (DQOs) process is used to define the type, quantity and quality of data needed to support decisions relating to the environmental condition of a site. DQOs were developed in accordance with the ASC NEPM (Schedule B2). The process consists of seven distinct steps, as shown below:

- State the problem;
- Identify the decision;
- Identify inputs to the decision;
- Define the study boundaries;
- Develop a decision rule;
- Specify limits on decision errors; and
- Optimise the design for obtaining data.

A summary of the DQO definition process for the APECs that require investigation is provided in **Table 9** below.

Table 9 Summary of Data Quality Objectives

	Data Gap 1: Presence/Absence of PFAS Impacts in Soil and/or Sediment	Data Gap 2: Presence/Absence of PFAS Impacts in Groundwater	Data Gap 3: Presence/Absence of PFAS Impacts at Site Boundaries
Step 1 Problem Statement	Problem Statement: Confirmation of presence or absence of PFAS or other identified COPC impacts to soil or sediment (in surface drains). Decision Makers/Stakeholders: AECOM, Airservices and PAPL Resources: Intrusive site investigation resources: surface and shallow depth soil samples collected by hand-auger and small drill rig	Problem Statement: Confirmation of presence or absence of PFAS impacts within shallow groundwater. Decision Makers/Stakeholders: AECOM, Airservices and PAPL Resources: Intrusive site investigation resources. Installation of shallow groundwater monitoring wells with a small drilling rig.	Problem Statement: Confirmation of the presence or absence of PFAS impacts at inferred APEC or at overall Airport Estate boundaries to inform of the potential risks posed to potential off-site receptors. Decision Makers/Stakeholders: AECOM, Airservices and PAPL Resources: Site investigation resources required for the collection of surface water, sediment and groundwater samples.
Step 2 Decision Identification	<i>Are PFAS impacts present within surficial soils and/or shallow soil horizons within all APEC or can some of these areas be ruled out as potential Source Zones?</i>	<i>Have PFAS impacts migrated to groundwater within those APEC where PFAS in soil has previously been detected (or inferred by analyses of excavated soils)?</i>	<i>Have PFAS impacts migrated beyond specific APEC or Airport boundaries? To what extent do surface water pathways cause direct off-site discharge of AFFF derived contaminants?</i>
Step 3 Decision Inputs	Conduct a soil and sediment sampling program within and close to APECs. <u>APEC 3b: Old Incinerator Building</u> - Installation of 5 soil bores (SB1711-SB1714 and 17071) <u>APEC 4: Current ARFF Fire Station</u> - Installation of 4 soil bores (SB1722 – SB1725) <u>APEC 5: Suspected Former Fire Training Area A (Airport Central)</u> - Installation of 7 soil bores (SB1715 – SB1721) <u>APEC 6: Suspected Former Fire Training Area B (Airport West)</u> - Installation of 10 soil bores (SB1701 – SB1710).	Conduct monitoring well installation and site wide groundwater sampling event: <u>APEC 1: Former Workshop and Tyre Store</u> - Conducted groundwater sampling utilising the existing (6) monitoring wells <u>APEC 2: Former ARFF Fire Station</u> - Conducted groundwater sampling utilising the existing (2) monitoring wells <u>APEC 3a: Current Fire Training Ground</u> - Conducted groundwater sampling utilising the existing (3) monitoring wells <u>APEC 3b: Old Incinerator Building</u> - Conversion of SB1712 into groundwater monitoring well MW1708 - Conducted groundwater sampling utilising the existing (1) monitoring well and the newly installed monitoring well. <u>APEC 4: Current ARFF Fire Station</u> - Conversion of SB1724 into groundwater monitoring well MW1706 - Conducted groundwater sampling utilising the existing (1) monitoring well and the newly installed (1) monitoring well. <u>APEC 5: Suspected Former Fire Training Area A (Airport Central)</u> - Conversion of SB1716 into groundwater monitoring well MW1705 - Conversion of SB1717 into groundwater monitoring well MW1704 - Conducted groundwater sampling utilising the existing (1) monitoring well (shallow and deep) and the newly installed (2) monitoring wells. <u>APEC 6: Suspected Former Fire Training Area B (Airport West)</u> - Conversion of SB1701 into groundwater monitoring well MW1701 - Conversion of SB1702 into groundwater monitoring well MW1702 - Conversion of SB1709 into groundwater monitoring well MW1703 - Conducted groundwater sampling utilising the existing (1) monitoring well and the newly installed (3) monitoring wells. <u>Site wide:</u> - Sampling of selected wells (6) from the pre-existing monitoring network to delineate impact (if any) outside of established APECs.	As indicated in relation to Data Gaps 1 and 2, several sampling locations were located at APEC / cadastral / Airport boundaries, in order to best utilise the limited investigation scope to evaluate potential cross-boundary impacts. Conducted groundwater sampling from new and selected existing groundwater monitoring infrastructure at locations close to APEC / Airport boundaries. 6 monitoring wells were sampled outside of the established APECs (MW0120N, MW0135, MW0146, MW0154, MW0172 and MW0180) 12 surface water samples were collected outside of the established APECs (SW1701, SW1702, SW1705, SW1708-SW1716). See Figure 3 for the locations of these additional samples.

	Data Gap 1: Presence/Absence of PFAS Impacts in Soil and/or Sediment	Data Gap 2: Presence/Absence of PFAS Impacts in Groundwater	Data Gap 3: Presence/Absence of PFAS Impacts at Site Boundaries
Step 4 Study Boundaries	Spatial: Within or at the Site boundaries as shown in Figures 4a – 4d Temporal: Timely consultation with Airservices and PAPL to allow access to proposed sampling locations. Constraints: Approvals from PAPL, Airservices and other site users/stakeholders and potential conflicts between investigation locations and critical services.	Spatial: Within the Site boundaries only and specifically at APEC 1, 2, 3a, 3b, 4, 5 and 6 as shown by Figures 5a – 5g Temporal: Timely consultation with Airservices and PAPL to allow access to proposed locations. Constraints: Approvals from PAPL, Airservices and other site users/stakeholders. Potential conflicts between investigation locations and critical airport services may exist.	Spatial: In proximity to APEC and the Site boundaries as shown in Figure 3 and Figure 5h. Temporal: Timely consultation with Airservices and PAPL to allow access to proposed locations. Constraints: Approvals from PAPL, Airservices and other site users/stakeholders. Potential conflicts between investigation locations and critical airport services may exist.
Step 5 Decision Rules	Soil analytical data was assessed against adopted Assessment Criteria (refer Section 10.0). The initial soil quality studies undertaken in this Limited investigation, as per the SAQP (AECOM, 2017b) were designed to confirm presence or absence of PFAS only.	Groundwater analytical data was assessed against the adopted Assessment Criteria (refer Section 10.0). The initial groundwater quality studies undertaken in this Limited investigation, as per the SAQP (AECOM, 2017b) were designed to confirm presence or absence of PFAS only. Full delineation may not be achieved based on the limited number of investigation locations proposed.	Analytical data was assessed against the adopted Assessment Criteria (refer Section 10.0).
Step 6 Decision Error Limitation	The potential for significant decision errors was minimised via a robust QA/QC program in accordance with NEPM guideline requirements. Standard operating procedures were followed to ensure accurate and representative data acquisition. Data quality indicators (DQIs) were applied to assess the usability of data based on precision, accuracy, representativeness, comparability and completeness. The acceptable limit on decision error is 100% compliance with the applied DQIs. If any of the DQIs are not met, further assessment will be necessary to evaluate the significance of any non-conformance and any necessary corrective actions.		
Step 7 Design Optimisation	Soil and sediment sampling locations were selected on the basis of accessibility and proximity to potential or suspected PFAS impacted areas. Note that not all proposed sampling locations were utilised (refer to deviations from SAQP in Section 1.3) as some locations were inaccessible.	Proposed monitoring well locations were selected to confirm the presence or absence of PFAS impacts. Existing monitoring wells were utilised for the collection of groundwater samples	Sampling locations were refined based on site observations and: - The ability to safely access sampling locations - The likelihood of the location being a continuous or ephemeral surface water feature

7.0 Areas of Potential Environmental Concern

As a result of the combined information searches, site inspections and site interviews, the following key Areas of Potential Environmental Concern (APEC) have been identified (within the Site) as summarised in **Table 10**.

Table 10 Areas of Potential Environmental Concern

APEC	APEC Description	Airport Zone	Known Issues	COPC
1	Former Workshop and Tyre Store	Airport West	Historical AFFF storage and maintenance-related discharge. Reported impacts to soil, groundwater, surface water and concrete	PFAS
2	Former ARFF Fire Station	Airfield	- Historical AFFF use and reported impacts to soil, groundwater, surface water and concrete - Excavated materials from site demolition remain stockpiled east of current Fire Station - ARFF operational area and surrounds, including soil impacts caused by washing of hoses and testing of firefighting trucks	PFAS
3a	Fire Training Ground	Airport North	- Controlled burn and fire training activities since 1980's - ASTs (kerosene and LPG) - AFFF use and storage from 1980-2010	TPH, PFAS, heavy metals
3b	Incinerator Building	Airport North	- Used in training activities, potentially involving AFFF - AFFF use and storage	TPH, PFAS
4	Current ARFF Fire Station	Airport North	- Diesel AST's - Solberg Foam Stored - HDPE Contained waste materials from Former Station	TPH
5	Suspected Former Fire Training Area A	Airport Central	Mock-up fire training ground and drills undertaken in the early 1980's in the area between the T1 complex and the Northern Main Drain	TPH, PFAS
6	Suspected Former Fire Training Area B	Airport West	Anecdotal reports of combined drills between DFES and ARFF in vacant bushland west of main runway	TPH, PFAS

8.0 Limited Sampling Methodology

Field activities were conducted at the site in accordance with:

- Australian Standard 4482.0, Guide to Sampling and Investigation of Potentially Contaminated Soil.
- Australian Standard 5667.11, Water Quality - Sampling - Guidance on Sampling of Groundwaters.
- DER, 2014. Contaminated Sites Guidelines: Assessment and Management of Contaminates Sites, Issued: December 2014.
- DER, 2017. Contaminated Sites Guidelines: Interim Guideline on the Assessment and Management of Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS), Version 2.1; Issued: January 2017.
- AECOM, 2017c. PFAS Sampling Guidance (AECOM Internal Use Only)

A summary of works is provided in **Table 11** below:

Table 11 Field Work Activity Summary

Dates	Activities	Contractors / AECOM
31 August 2017	Services / utilities clearance was undertaken at all new soil bore locations using GPR (ground penetrating radar) and CAT (cable avoidance tool) methods. Cleared locations were then surveyed and demarcated (with additional space for variation, as required) for future intrusive works.	 AECOM
12 September and 2-3 October 2017.	Supervision of the advancement of 26 soil bores to a maximum depth of 8.5 m below ground level (bgl) (SB02/MW1708), comprising: • APEC 3b: 5 soil bores (SB1711-SB1714 and SB17071). • APEC 4: 4 soil bores (SB1722 – SB1725) • APEC 5: 7 soil bores (SB1715 – SB1721) • APEC 6: 10 soil bores (SB1701 – SB1710). Conversion of 7 soil bores into groundwater monitoring wells to a maximum depth of 8.5 m bgl, comprising: • APEC 3b: 1 monitoring well: - SB1712 into MW1708. • APEC 4: 1 monitoring well: - SB1724 into MW1706. • APEC 5: 2 monitoring wells: - SB1716 into MW1705. - SB1717 into MW1704. • APEC 6: 3 monitoring wells: - SB1701 into MW1701. - SB1702 into MW1702. - SB1709 into MW1703. Collection of 52 primary soil samples for laboratory analysis of PFAS and hydrocarbons; Drilling methods applied were push tube and hollow stem auger with a Geoprobe® rig	 (Heritage Monitors) AECOM

Dates	Activities	Contractors / AECOM
21 September, 3 – 9 and 17 – 19 October	Completion of a GME with a peristaltic pump including the gauging and sampling of 23 groundwater monitoring using low-flow sampling techniques; Collection of 29 primary groundwater samples for laboratory analysis of PFAS and hydrocarbon compounds. Groundwater samples were collected from 7 newly installed monitoring wells and selected pre-existing wells.	AECOM
5 December 2017	Surveying of newly installed groundwater monitoring wells to m AHD.	██████████ AECOM

8.1 Health and Safety Planning

Prior to commencement of site works, a site-specific Health, Safety and Environment Plan (HSEP) was developed accordance with AECOM and Airservices Australia policy. All Site works undertaken by AECOM, and AECOM preferred subcontractors (██████████ - subsurface clearance and surveying, ██████████ – non-destructive digging (NDD)) was conducted in accordance with the AECOM HSEP titled: *Limited Site Investigations – Perth Airport, Reference 60543717 dated 20 June 2017*.

All AECOM subcontractors and AECOM field personnel undertaking the works at Perth International Airport completed the Airservices Australia Contractor General Induction Course and undertook the Drug and Alcohol Testing according to the Airservices Requirements and to the following Standards:

- AS 4760:2006 Procedures for specimen collection and the detection and quantitation of drugs in oral fluid.
- AS 4308:2008 Recommended practices for the collection, detection and quantitation of drugs of abuse in urine.

Due to intrusive and sampling works being conducted Air Side at the Perth International Airport, permits were obtained for AECOM and subcontracted staff.

A copy of the HSEP was available at the work site at all times during the fieldworks.

8.2 Underground Services Identification (Subsurface Clearance)

Prior to any intrusive works being conducted on Site, AECOM supervised the completion of underground service clearance for all proposed soil bore and monitoring well locations on site.

Dial before you dig (DBYD) utility plans were obtained by AECOM from ATCO Gas, NextGen Networks, Perth Airport, NBN, City of Swan Council, Pipe Networks, Horizon Power, Telstra, Water Corporation WA. DBYD Job Numbers 12715806 (APEC 1), 12715885 (APEC 2), 12715955 (APEC 3A), 12715979 (APEC 3B), 12716092 (APEC 4), 12716050 (APEC 5) and 12716122 (APEC 6).

The service identification and clearance was informed by current Dial Before you Dig (DBYD) plan and site utility information provided by discussions on site with Airport and Fire Station personnel.

██████████ were engaged to identify and mark out underground services and clear proposed investigation locations prior to the commencement the intrusive works. All subsurface clearance works were undertaken under the supervision of AECOM personnel. Subsurface clearance techniques included Ground Penetrating Radar (GPR) and Cable Avoidance Tools (CAT).

AECOM Service identification and Clearance Procedure (S4AN-783-PR1) was followed with regards to obtaining Service Identification and Clearance Variation Approval for drilling in proximity to services and amendments to the hand clearance requirements.

8.3 Non-Destructive Digging

In addition, to the service clearance of all locations using GPR and CAT, all drill locations were cleared by non-destructive digging (NDD) methods by [REDACTED] using a hand auger to remove soil. Non-destructive clearance was advanced to a minimum of 1.5 m bgl at each location. Each location was cleared to a minimum of 30% greater than the diameter of the proposed drill stem to ensure that the area has been safely cleared of services before drilling commences. NDD was undertaken in order to prevent damage to any unrecorded/undetected underground services encountered.

8.4 Drilling Methodology

The advancement of soil bores and the conversion of select bores to monitoring wells was undertaken by AECOM's preferred supplier [REDACTED].

8.4.1 Advancement of Soil Bores

Once the location was cleared, soil bores were advanced using a Geoprobe[®] rig. Where ground conditions allowed, the soil bores were advanced using direct push techniques to allow the collection of relatively undisturbed soil samples for logging and sub-sampling for laboratory analysis.

8.4.2 Groundwater Monitoring Well Installation

Select soil bores were converted to groundwater monitoring wells utilising hollow stem auger drilling methods. Monitoring wells were 50 mm in diameter and constructed using Class 18 uPVC. Monitoring wells were constructed with a minimum 3.0 m screen length attached to plain casing screw fitting installed in an approximately 225 mm diameter bore. The 3 m screen length was installed to allow collection of samples from the shallow groundwater and to account for seasonal groundwater fluctuations. Screened sections were installed in a gravel filter pack, placed approximately 0.5 to 1.0 m above the top of the screen and to be isolated with a bentonite seal with any remaining void to the ground surface backfilled with bentonite cement grout.

The annulus around the screen was backfilled with a clean sand filter pack. The screened section was isolated with a 0.5 m thick bentonite seal, with the remaining void to the ground surface backfilled with cement grout.

Each well was constructed with a lockable well cap and fitted with steel risers secured in concrete, with the exception of MW1701 which was constructed as a trafficable flush-mounted gatic cover secured into position with concrete.

Groundwater monitoring wells were developed to remove any drilling water and fines caused during the installation process before sampling is undertaken. All water generated was contained within 205L sealed drums to be removed and disposed of off-site by a licensed waste disposal contractor.

All wells were developed immediately following installation using a 12V submersible pump to purge the remaining drill cutting, fines/ and or mud and any introduced water following installation. Each bore was developed until the purge water turned clear, or to a minimum purge volume of 50L of purge water. The screened section of the wells was targeted during the well development.

The monitoring wells were left to reach equilibrium for a minimum of one week prior to groundwater sampling.

Well construction details are shown along with the soil bore logs in **Appendix K**.

8.4.3 Decontamination and Waste Management

Hand auger, drilling equipment and the 12V submersible pump were decontaminated between sampling locations, by removing any adhered soils and by scrubbing with brushes and Liquinox detergent (suitable for PFAS decontamination), followed by rinsing. Liquinox mixed with water was applied to the drilling equipment using a pressure washer between drill locations to avoid potential cross-contamination. Excess waste soil was temporarily stored in 205 L drums, for subsequent collection, transport and disposal by a licensed waste disposal contractor (certificates presented in **Appendix J**).

8.5 Soil Bore Logging and Sampling Methodology

The handling, collection and preservation of all soil samples submitted for laboratory analysis complied with the practices detailed in Australian Standards AS 4482.1 2005, with additional requirements in relation to using PTFE-free materials in all aspects of the fieldworks.

Soil samples were collected at regular intervals down the profile and at points of change in geology. The exact depth of soil sampling was determined in the field during drilling activities.

Collection of soil cores via the use of percussive push-tube sampling was not possible for all soil bores. As such, representative samples of sub-surface soils for some wells were recovered from the drill arising's on the rotary augers.

Soil samples were collected using field equipment including a stainless a hand-auger to advance shallow soil bores.

Hand auger advanced soil bores were completed using the following methodology:

- Soil bores were advanced using a hand auger to a target depth of 1.5m bgl. In some locations, the depth of 1.5m bgl could not be achieved due to ground conditions (refusal).
- Disturbed soil samples were collected from 0.0- 0.2 m bgl (surface) and 0.5 - 1.5 m bgl.
- Soil samples were collected directly from the hand auger into laboratory prepared sample jars for PFAS and hydrocarbons. Note: when specific PFAS sampling containers, ran out, samples were collected in glass jars with 'Teflon' Liners' removed.

Representative soil samples were recovered and placed into laboratory prepared glass (TRH/ BTEXN) or plastic (PFOS) sample jars. Sealed jars were placed into an ice-filled esky or refrigerator immediately following collection for subsequent delivery via courier to the nominated National Association of Testing Authorities (NATA) accredited laboratory.

To provide an indication of potential organic contaminants within soil, sub-samples were obtained at regular depth intervals, placed in a half-full zip-lock plastic bag and screened for volatile organic compounds (VOCs) using a photo-ionisation detector (PID) with a 10.6 volt bulb. Samples for hydrocarbon analysis were selected based the likelihood of contamination being present and on visual/olfactory observations, PID readings, and depth.

To support subsequent data interpretation, soil bores were logged in general accordance with the Unified Soil Classification System (USCS) and graphically transcribed into soil-logging software.

All field equipment was calibrated prior to use on-site and calibration records are provided in **Appendix I**. The specific depths for the soil samples collected are detailed on the soil bore logs in **Appendix K**.

8.6 Groundwater Sampling

Gauging of static water level (SWL) was completed on 18 October 2017 prior to the commencement of the GME sampling program.

All groundwater monitoring wells were purged using low-flow techniques², consistent with standard AECOM practices and in general accordance with AS/NZS 5667.11:1998 *"Water Quality – Sampling, Part 11: Guidance on Sampling of Groundwaters"* (AS/NZS 5667.11:1998). A peristaltic pump was used to recover groundwater samples dependent on response zone depth, with the pump inlet positioned 0.5m below the SWL in each well screen for all shallow wells.

Groundwater samples (representative of formation water) were collected following observed stabilisation of field indicator parameters including dissolved oxygen, oxidation-reduction potential (redox), electrical conductivity, temperature and pH.

² As described in US EPA Standard Operating Procedure GW0001 Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells.

The key procedures undertaken during the Groundwater Monitoring Event (GME) were:

- Measurement of the depth to water prior to sampling;
- Identification of any non-aqueous phase liquid, if present, and measurement of thickness;
- Measurement of the depth to the base of the well following sampling;
- Groundwater purging of each well using a low flow peristaltic pump, including dedicated tubing for each groundwater monitoring well;
- Recording of groundwater quality parameters during purging using a multi-parameter meter fitted with a flow-through-cell;
- All field equipment was calibrated prior to use on-site and calibration records are provided in **Appendix I**.
- Collection of groundwater samples directly into laboratory supplied and appropriately preserved bottles;
- Collection of groundwater samples and field QA/QC samples for laboratory analysis;
- Temporary storage of purged water on-site in 205 L sealed drums prior to removal and disposal in an appropriate manner by a licensed waste disposal contractor; and
- Decontamination of all non-dedicated sampling equipment between sample locations.

8.7 Groundwater Monitoring Well Elevation Surveying

All new groundwater monitoring well locations were surveyed on 5 December 2017 by [REDACTED] Surveyors, a licenced surveying company for horizontal location and elevation to metres Australian Height Datum (m AHD) to enable interpretation of groundwater gradients. Horizontal Datum was provided in Map Grid Australia (MGA94), Zone 50 to an accuracy of 50mm in the x, y plane and to +/- 2mm vertically, relative to AHD. A copy of the survey data is provided in **Appendix L**. [REDACTED] conducted the survey of 7 wells.

8.8 General Field Practices

8.8.1 Fieldwork Documentation

Field data and observations were recorded on field sheets and included but not be limited to:

- Project name and number
- Date, time, weather conditions
- Personnel present
- Site diary detailing all activities undertaken during the day
- Health and safety observations
- All aspects of sample collection (including sample type, location, time of collection, sampling method, visual description and primary/duplicate sample names)
- Field measurements
- Equipment calibration documentation

8.8.2 Field Equipment Calibration

Equipment used to perform testing or data recording (PID, water quality meter and water level meter) was calibrated prior to use. Calibration checks and adjustments were performed before equipment the equipment as used in field operations. Calibration records are provided in **Appendix I**.

8.8.3 Sample Labelling

Each sample container was clearly labelled and marked with waterproof ink in the field. Sample labels included at least the following information:

- Project number
- Sampling date
- Unique sample number
- Sample point number/designation

8.8.4 Sample Storage and Transport

As each sample was collected, it was placed into a chilled Eskey. Samples were kept secure and chilled during the field program and during subsequent transportation to the laboratory. Samples were stored and transported by courier under chain of custody documentation, completed during the field program.

8.9 Laboratory Analysis

8.9.1 Laboratory Selection

AECOM utilised the services of Australian Laboratory Group (ALS) based in Perth as the primary laboratory and Eurofins as the secondary laboratory to conduct the analysis of soil and groundwater. The two laboratories were selected as they were:

- Accredited by the National Association of Testing Authorities (NATA);
- Certified by NATA to conduct the specific tests required, unless NATA does not certify a particular analysis or method specified; and
- Able to demonstrate that it can achieve the required analytical limits of reporting (typically an order of magnitude below the respective assessment criteria for the matrix and parameter).

8.9.2 Soil and Groundwater Analytical Suites

A summary of the laboratory analysis suite, methods and Limit of Reporting (LOR) is presented in **Table 12** (below). Based on the chemicals of potential concern (COPCs) for the Site, the proposed analytes were chosen based on the CSM and to meet the DQOs. The detailed analytical suite is presented in **Table 13**(below).

Table 12 Analysis Suites and Methods

Sample Type	Parameter	Analytical Method Reference	LOR
Soil (Solid)	PFAS	LC/MS-MS	0.0002 - 0.001 mg/kg
	BTEXN and TRH C ₆ – C ₄₀ fractions	P&T/HC-GC/MS	0.2 – 100 mg/kg
Water	PFAS	LC/MS-MS	0.02- 50 µg/L
	BTEXN and TRH C ₆ – C ₄₀ fractions	P&T/HC-GC/MS	1 – 100 µg/L

Table 13 Detailed Analyte suite (COPC)

PFAS Group	Compound	CAS No.
Perfluoroalkyl Sulfonic Acids	Perfluorobutane sulfonic acid (PFBS)	375-73-5
	Perfluoropentane sulfonic acid (PFPeS)	2706-91-4
	Perfluorohexane sulfonic acid (PFHxS)	355-46-4
	Perfluoroheptane sulfonic acid (PFHpS)	375-92-8
	Perfluorooctane sulfonic acid (PFOS)	1763-23-1
	Perfluorodecane sulfonic acid (PFDS)	335-77-3
Perfluoroalkyl Carboxylic Acids	Perfluorobutanoic acid (PFBA)	375-22-4
	Perfluoropentanoic acid (PFPeA)	2706-90-3
	Perfluorohexanoic acid (PFHxA)	307-24-4
	Perfluoroheptanoic acid (PFHpA)	375-85-9
	Perfluorooctanoic acid (PFOA)	335-67-1
	Perfluorononanoic acid (PFNA)	375-95-1
	Perfluorodecanoic acid (PFDA)	335-76-2
	Perfluoroundecanoic acid (PFUnDA)	2058-94-8
	Perfluorododecanoic acid (PFDoDA)	307-55-1
	Perfluorotridecanoic acid (PFTTrDA)	72629-94-8
	Perfluorotetradecanoic acid (PFTeDA)	376-06-7
Perfluoroalkyl Sulfonamides	Perfluorooctane sulphonamide (FOSA)	754-91-6
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2
	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7
	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2
	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6
(n:2) Fluorotelomer Sulfonic Acids	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4
	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4
	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0
Petroleum Hydrocarbons		
Total Recoverable Hydrocarbons C ₆ – C ₄₀ Fractions		TRH (C ₆ – C ₄₀)
Benzene, Toluene, Ethylbenzene, Xylene, Naphthalene		BTEXN

9.0 Quality Assurance / Quality Control

Quality Assurance protocols applicable to the field and analytical program allow the assessment and verification of the accuracy, repeatability and reliability of the generated analytical data set.

9.1 QA/QC Samples

The quality control procedures are outlined in SAQP (AECOM, 2017b) and any deviation to the quality control procedures is outlined in the Data Validation Summaries below. Field Quality Control Data are provided in **Appendix M**.

The following Quality Control (QC) samples were collected during the field program:

- Duplicate samples to allow for intra-laboratory analysis
- Triplicate samples to allow for inter-laboratory analysis
- Trip Blank samples to examine the potential for sample cross contamination (during sample storage and transit and only for volatile contaminants)
- Field Blank samples were collected in order to monitor the introduction of sample contamination from background field conditions
- Rinsate samples to check the precision and accuracy of sampling equipment decontamination procedures

All QA/QC samples collected during the project (for all types of samples collected) had the naming convention of **[MediaType][QA](number) -YYMMDD**, where:

- MediaType is either S (soil) or W (water).
- QA (number) is a QA/QC sample with a specific number
- YYMMDD provides date information i.e. year / month /date

9.2 Laboratory Analysis Plan

The selected laboratories employed the following methods to ensure quality, accuracy, precision and completeness of the analytical data generated as part of this investigation.

All primary and duplicate samples were submitted to the primary laboratory (ALS). Triplicate samples were submitted to a secondary laboratory (Eurofins). Both analytical laboratories were NATA accredited and perform all laboratory testing to the appropriate standards required for environmental assessment.

The performance of the lab QA/QC measures were assessed in accordance with the PARCC parameters (precision, accuracy, representativeness, comparability and completeness). Independent assessment of the laboratory QA/QC measures was undertaken during the preparation of site investigation reports and assessed the following:

- Method Blanks
- Laboratory control samples
- Matrix Spike and Matrix Spike Duplicates
- Laboratory Duplicates
- Surrogates

9.3 Analytical Data Validation

Analytical data validation is the process of assessing if data are in compliance with method requirements and project specifications as outlined in the ASC NEPM. The primary objectives of this process are to ensure that data of known quality are reported, and to identify if the data can be used to fulfil the overall project objectives.

Specific elements of data validation that will be checked and assessed for this project are:

- preservation and storage of samples upon collection and during transport to the laboratory
- sample holding times
- required limits of reporting
- frequency of conducting quality control measurements
- laboratory blanks
- rinsate blanks
- trip blanks
- field duplicates
- laboratory duplicates
- inter-laboratory duplicates
- laboratory control samples
- matrix spike/matrix spike duplicates
- surrogates
- the occurrence of apparently unusual or anomalous results, e.g. laboratory results that appear to be inconsistent with field observations or measurements.

9.4 Corrective Actions

Analytical data that fail to meet the predetermined data quality indicators were managed using the following corrective actions on a case-by-case basis:

- reanalyse suspect samples, provided sample or extract is within holding time
- evaluate and amend sampling and/or analytical procedures
- resampling and reanalysis
- accept the data as an estimate with an acknowledged level of bias and imprecision

In the event that data of questionable reliability are used, restrictions and limitations associated with the use of such data are clearly identified and discussed.

A summary of the data validation undertaken as part of the soil sampling program is provided below. All relevant laboratory reports (including the laboratory QA/QC reports) are included in **Appendix N**. Field Quality Assurance / Quality Control (QA/QC) data are included in **Appendix M**.

9.5 Soil Data Validation

Validation of the soil data is discussed below:

- Soil samples were collected in laboratory supplied sample containers.
- A field blank (SQA08_120917) was collected at a frequency of one each per day of soil sampling. Field blank concentrations were below the LOR for all analytes. A rinsate blank (SQA07_120917) was collected as part of this investigation for which all analytes were below LOR. One trip blank (SQA03_041017) was submitted and analysed for volatile hydrocarbon fractions, all analytes were below LOR.

- Primary and duplicate soil samples were received correctly preserved with ice, noting that samples were sent by road. ALS laboratory received the samples at temperatures of 3.8 °C (EP1710035) and 19.3 °C (EP1710913). The recommended temperature range for sample preservation is 4 °C ± 2 °C. The sample receipt temperature is not considered to affect the integrity of the PFAS soil samples and there were no observations of hydrocarbon impact in the field as confirmed by the laboratory analysis suggesting that the sample receipt temperature for hydrocarbons would have had no influence.
- The triplicate soil samples were received at the Eurofins laboratory with ice at a temperature of 18.8 °C (562900), 20.0 °C (565739), 17.4 °C (565919) and 4.6 °C (566735) and without ice at a temperature of 20.0 °C (565739). The sample receipt temperature for the secondary laboratory is also not considered to affect the integrity of the PFAS soil samples and there were no observations of hydrocarbon impact in the field as confirmed by the laboratory analysis suggesting that the sample receipt temperature for hydrocarbons would have had no influence.
- A total of 4 field duplicates and 3 field triplicates (inter-laboratory duplicates) were collected for PFAS analysis meeting the frequency of one in twenty primary samples (i.e. one of each). Field relative percentage differences (RPDs) exceeded control limits between the primary and duplicate/triplicate sample for some samples with the following COPCs:
 - Sum of PFAS
 - PFOS
 - Sum (PFHxS + PFOS)
 - PFHxS (RPD: 143%)
 - PFOA (RPD: 111%)
 - PFOS (RPD: 199%)
 - 8:2 FTS
 - FOSA
 - PFDS
 - PFTTrDA
 - PFDcA
 - PFHpA
 - PFHxA
 - PFDoA
 - PFNA
 - PFUnA
 - >C10-C16 fraction
 - >C10-C16 (minus Naphthalene)(F2)
 - >C16-C34 fraction
 - >C34-C40 fraction
 - >C10-C40 fraction (sum)
- All soil samples were extracted and analysed within recommended holding times.
- Method blanks were within control limits.
- Laboratory duplicates were within control limits.
- No laboratory control outliers were reported.
- No surrogate outliers were reported.

- Matrix spike recoveries were within control limits, the exception of matrix spike recoveries not determined for: PFOS (SB1715_0.0_0.1 and SB1717_0.1_0.5) due to the background level greater than or equal to 4x spike level and for SB1701_021017-0.0-0.10 (PFBS, PFPeS, PFHxS, PFHpS, PFOS, PFDS, PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDA, PFUnDA, PFDoDA, PFTTrDA, PFTeDA, FOSA, MeFOSE, EtFOSE, 4:2 FTS, 8:2 FTS & 10:2 FTS) and SQA11_021017 (PFBS, PFPeS, PFHxS, PFHpS, PFOS, PFDS, PFBA, PFPeA, PFHpA, PFOA, PFNA, PFDA, PFUnDA, PFDoDA, PFTeDA, FOSA, MeFOSE, EtFOSE, 6:2 FTS, 8:2 FTS & 10:2 FTS) due to recovery of less than lower data quality objective.
 - No samples required dilution due to the presence of high concentrations of contaminants.
- No apparent anomalies between field observations and resultant data occurred.

Refer to **Appendix N** for the laboratory documentation and **Appendix M** for the Field QAQC tables.

9.6 Surface Water Validation

- Surface water samples were collected in laboratory supplied sample containers
- A field blank, trip blank and rinsate sample was collected at a frequency of one each per day of sampling. Field and rinsate blank concentrations were below the LOR for all analytes (**Appendix M**)
- Primary and duplicate groundwater samples were received correctly preserved with ice, noting that samples were sent by road. ALS laboratory received the samples at temperatures of 13.2 °C (EP1710405), 7.1 °C (EP1711124), 5.3 °C (EP1711070) and 3.8 °C (EP1710035). The recommended sample temperature is 4 °C ± 2 °C, for which some of these batches fall outside of.
- Triplicate samples were received by Eurofins at a temperature of 18.8 °C (562900).

For each of these batches the samples were submitted on the day of sampling, in some instances leaving insufficient time for the samples to cool from ambient surface water temperature. Furthermore, PFAS compounds, the primary COPCs of this investigation are relatively stable compounds not prone to volatilisation or thermal degradation.

- At total of 2 field duplicate and 2 field triplicate (inter-laboratory duplicates) were collected at a frequency of one in ten primary samples (i.e. one of each). Where field relative percentage differences (RPDs) were outside of control limits between the primary and duplicate sample and between the primary and triplicate sample, the highest value was presented for conservatism (**Appendix M**)
 - Field relative percentage differences (RPDs) exceeded control limits between the primary and duplicate/triplicate sample for some samples with the following COPCs:
 - PFHxS
 - >C16-C34 fraction
 - PFOA
 - PFHpA
- All surface water samples were extracted and analysed within recommended holding times.
- Method blanks were within control limits.
- Laboratory duplicates were within control limits.
- Lab control outliers were not reported.
- No surrogate outliers were reported.
- Matrix spike recoveries were within control limits, the exception of matrix spike recoveries not determined for SW1708_200917 for PFOS due to the background level greater than or equal to 4x spike level.

- No samples required dilution due to the presence of high level contaminants; or dilution due high conductivity. LOR values have not been adjusted by the laboratory.

No apparent anomalies between field observations and resultant data occurred.

Refer to **Appendix N** for the laboratory documentation and **Appendix M** for the Field QAQC tables.

9.7 Groundwater Data Validation

Validation of the groundwater data is discussed below:

- Groundwater samples were collected in laboratory supplied sample containers
- A field blank, trip blank and rinsate sample was collected at a frequency of one each per day of sampling. Field and rinsate blank concentrations were below the LOR for all analytes (**Appendix M**)
- Field blanks (WQA06_200917, WQA08_210917, WQA10_021017, WQA03_031017, WQA07_031017, WQA09_041017, WQA13_061017, WQA19_091017, WQA03_171017, WQA05_181017, WQA09_191017) and rinsate samples (WQA04_031017, WQA04_171017, WQA06_171017, WQA07_210917, WQA08_031017, WQA09_021017, WQA10_041017, WQA10_191017, WQA14_061017, WQA18_091017) were collected at a minimum frequency of one each per day of sampling. Field blank concentrations were below the LOR for all analytes. Rinsate blank concentrations were also below the LOR for all analytes (**Appendix M**).
- Trip blank samples (LR TBS395, LR TBS398, LR TBS399, TBS451, TBS450, TBS425, SQA03_041017) were collected at a frequency of one per esky and reported concentrations below the LOR for all analytes (**Appendix M**).
- Primary and duplicate groundwater samples were received correctly preserved with ice, noting that samples were sent by road. ALS laboratory received the primary samples at temperatures of 13.2 °C (EP1710405), 1.1 °C (EP1710473), 19.3 °C (EP1710913), 5.3 °C (EP1711070), 7.1 °C (EP1711124), 14.7 °C (EP1711196) and 13.4 °C (EP1711644). The recommended sample temperature is 4 °C ± 2 °C, for which some of these batches fall outside of.
- The triplicate samples were received correctly preserved at the Eurofins laboratory. Eurofins received the samples at temperatures of 10.5 °C (564136), 4.6 °C (566735), 3.3 °C (566601), 15.4 °C (566796) and 11.1 °C (568454). The recommended sample temperature is 4 °C ± 2 °C, for which some of these batches fall outside of.

For each of these batches the samples were submitted on the day of sampling, in some instances leaving insufficient time for the samples to cool from ambient groundwater. Furthermore, PFAS compounds, the primary COPCs of this investigation are relatively stable compounds not prone to volatilisation or thermal degradation.

- At total of 3 field duplicate and 3 field triplicate (inter-laboratory duplicates) were collected at a frequency of one in ten primary samples (i.e. one of each). Where field relative percentage differences (RPDs) were outside of control limits between the primary and duplicate sample and between the primary and triplicate sample, the highest value was presented for conservatism (**Appendix M**). RPD exceedances occurred for some duplicate/triplicate samples in the following COPCs:
 - Perfluorobutanoic acid
 - Sum of PFAS
 - Sum of PFAS (WA DER List)
 - PFPeS
 - PFHpS
 - PFHxS
 - 6:2 FTS
 - PFOA
 - PFOS

- PFPeA
- Sum (PFHxS + PFOS)
- PFBS
- PFHpA
- PFHxA
- All groundwater samples were extracted and analysed within recommended holding times, with the exception of MWFTG-1_041017 and MWFTG-2_041017 080617 for Anionic Surfactants and MBAs.
- Method blanks were within control limits.
- Laboratory duplicates were within control limits.
- Lab control outliers were not reported.
- No surrogate outliers were reported.
- Matrix spike recoveries were within control limits, the exception of matrix spike recoveries not determined for MW1702_081117 for PFHxS and PFOS due to the background level greater than or equal to 4x spike level.
- No samples required dilution due to the presence of high level contaminants; or dilution due high conductivity. LOR values have not been adjusted by the laboratory.

No apparent anomalies between field observations and resultant data occurred.

Refer to **Appendix N** for the laboratory documentation and **Appendix M** for the Field QAQC tables.

10.0 Adopted PFAS Assessment Criteria

10.1 Overview

Identifying and selecting appropriate scientifically robust assessment criteria for a site can be a detailed process. Selection and use of assessment criteria were considered in the context of the CSM to ensure appropriate evaluation of potential human health and ecosystem risks.

The adopted PFAS assessment criteria are intended to be conservative, for the initial assessment of human health and ecological risk (i.e. Tier 1).

It is noted that overall risks to human health or the environment from PFAS cannot be evaluated simply by comparison of reported PFAS concentrations with the criteria discussed below, because PFAS has the potential to bioaccumulate within the food chain and the criteria do not take into consideration the potential for bioaccumulation via all potential pathways.

Adopted PFAS assessment criteria and reference documents are summarised below and in **Table 14**.

10.2 Human Health

10.2.1 Soil

- WA DER (2017) Interim Guideline on the Assessment and Management of PFAS – Health Based Screening Level (Commercial and Industrial land use).
- Airservices (GHD, 2017) Derivation of PFAS Soil and Water Criteria (HBSC) – Commercial / Industrial land use – Based on FSANZ TDI 2017.
- Airservices (GHD, 2015) Derivation of PFAS Soil and Water Criteria – Human Health Screening Levels (HILs) – Industrial land use (direct contact only).

10.2.2 Groundwater and Surface Water

- WA DER (2017) Non-potable and Recreational Use Guideline.
- WA DER (2017) Drinking Water Guideline.
- DoH (2017) Drinking Water Guideline – Based on FSANZ (2017) Health Based Guidance Values for PFAS.

10.3 Ecological

10.3.1 Soil

- Airservices (GHD, 2015) Derivation of PFAS Soil and Water Criteria – Ecological Screening Levels (EILs) – Commercial and Industrial land use at 60% protection, low reliability.

10.3.2 Groundwater and Surface Water

- WA DER (2017) Freshwater Guideline for Highly Disturbed Systems – 80% and 90% species protection.
- Airservices (GHD, 2015) Derivation of PFAS Soil and Water Criteria – Ecological Interim Screening Levels (EISLs) – toxicity effects on aquatic organisms.

Table 14 Adopted PFAS Assessment Criteria Summary

Receptor	Media	PFOS+PFHxS	PFHxS	PFOA	PFOS	8:2 FTS	6:2 FTS	Reference
Human Health	Soil (mg/kg)	--	100	--	--	--	--	WA DER (2017) Health Based Screening Level (Commercial and Industrial land use).
		--	--	680	--	--	--	Airservices (GHD, 2017) Commercial / Industrial land use – Based on FSANZ TDI 2017.
		--	--	240	90	240	900	Airservices (GHD, 2015) Human Health Screening Levels (HILs) – Industrial land use (direct contact only).
	Groundwater (µg/L)	5	5	50	5	--	--	WA DER (2017) Non-potable and Recreational Use Guideline.
		0.5	--	5	--	--	--	WA DER (2017) Drinking Water Guideline.
		0.07	--	0.56	--	--	--	DoH (2017) Drinking Water Guideline – Based on FSANZ (2017)
Ecological	Soil (mg/kg)	--	--	3.73	4.71	3.73		Airservices (GHD, 2015) EILs – Commercial and Industrial land use at 60% protection, low reliability.
	Groundwater (µg/L)	2	2	632	2	--	--	WA DER (2017) Freshwater Guideline for Highly Disturbed Systems – 90% species protection.
		31	31	1824	31	--	--	WA DER (2017) Freshwater Guideline for Highly Disturbed Systems – 80% species protection.
		--	--	2900	6.66	2900	--	Airservices (GHD, 2015) EISLs – toxicity effects on aquatic organisms.

11.0 Results

11.1 Field Observations

11.1.1 Lithology

Table 15 below provides a summary of the subsurface conditions encountered at each APEC during the September to October 2017 limited investigation. Refer to **Appendix K** for the Bore logs. No visual and/or olfactory observations of potential contamination were reported any of the soil bores.

Table 15 Summary of Lithology – June 2017

Depth intervals (m bgl)	Typical Lithology
APEC 1 – Former Workshop and Tyre Store. No new wells/bores installed at this location	
APEC 2 – Former ARFF Fire Station. No new wells/bores installed at this location	
APEC 3A – Current Fire Training Ground. No new wells/bores installed at this location	
APEC 3B – Incinerator Building	
0 – 0.75	SAND, grey-yellow, coarse grains, sub rounded to sub angular
0.75 – 1.5	SAND, yellow, coarse grains, sub angular, poorly graded
1.5 – 4.5	Sandy CLAY, grey-orange with red mottling, medium plasticity, 15% sand
4.5 – 5.5	CLAY, grey, highly plastic, grades to orange grey
5.5 – 6.0	Sandy CLAY, grey, medium plasticity,
6.0 – 8.5	SAND, grey, coarse grains, sub angular, poorly graded.
APEC 4 – Current ARFF Fire Station	
0 – 0.5	SAND, grey-brown, coarse grains, sub angular, well graded, some fines
0.5 – 4.0	SAND, yellow-brown, medium grains, sub angular, well graded, some fines
APEC 5 – Suspected Former Fire Training Area A (Airport Central)	
0 – 0.5	SAND, grey, coarse grains, sub rounded with organic matter, poorly graded
0.5 – 1.0	SAND, yellow-brown, coarse grains, sub rounded, poorly graded
1.0 – 1.5	SAND with gravels, red-brown mottling
1.5 – 3.0	Clayey SAND, brown-grey, coarse grains, poorly graded
3.0 – 4.5	Clayey SAND, grey, coarse grains, poorly graded, non-plastic
APEC 6 – Suspected Former Fire Training Area B (Airport West)	
0 – 0.5	SAND, brown, coarse grains, sub rounded to sub angular with organic matter, poorly graded
0.5 – 2.0	SAND, grey, coarse grains, sub rounded to sub angular, poorly graded
2.0 – 2.5	Gravelly SAND, red-brown, medium grained, sub angular to sub rounded, trace clay
2.5 – 4.0	SAND, light brown, coarse grained, sub angular to sub rounded

11.1.2 Groundwater

Table 16 below provides a summary of groundwater elevation and field groundwater chemistry observed during the GME. Refer to **Appendix O** for the field groundwater purging data, **Table T2** and **Table T4** (attached) for groundwater elevation and field chemistry data.

Table 16 Summary of Groundwater Field Observations

Field Observation	October 2017 GME
Groundwater Elevation (m AHD)	Groundwater elevation beneath the Site (18 October 2017) was calculated at each of the newly installed monitoring wells, ranging between 15.282 to 16.991 m AHD in the unconfined superficial aquifer at APEC 5 and APEC 6. Within the confined aquifer at APEC 3b the groundwater elevation was calculated to be 11.277 m AHD. Groundwater flow direction is inferred to flow in a north westerly direction. One outstanding data gap in determining the nature of groundwater flow at the site is casing RL data for the existing monitoring well network.
Dissolved Oxygen (DO) (mg/L)	DO ranged between 0.17 (MW26 - APEC 1) to 13.8 mg/L (MW0172 – Overall Wells) indicating anaerobic to aerobic conditions.
pH (pH units)	pH was similar across the APECs, from 4.38 (MW1701 – APEC 6) to 7.73 (MW0220 – APEC 2), indicating acidic to neutral conditions.
Electrical Conductivity (EC) (µS/cm)	Electrical conductivity across the site ranged between 136.8 (MW0221 – APEC 2) and 4,911 µS/cm (MWFTG-3 – APEC 3 A)
Total Dissolved Solids (TDS)* (mg/L)	Total dissolved solids across the site ranged between 79 (MW0120N – Overall Wells) and 3,192 mg/L (MWFTG-3 – APEC 3A) indicating fresh to brackish conditions across the site.
Redox Potential (mV)	Reduction-oxidation potential across the site ranged between -224 (ONW5 – APEC 4) and 234 mV (MW0216 – APEC 3B) indicating reducing to oxidising conditions are present across the site.
Temperature (°C)	Temperature across the site ranged from 17.2 (MW1706 – APEC 4) to 24.7 °C (MW34 – APEC 1)
General Comments and evidence of impact	Purged water was generally noted to be light yellow to brown, transparent to slightly turbid and odourless. Olfactory/visual observations of potential contamination were noted at wells MW22 and MW35 (APEC 1), MWFTG-2 (APEC 3A), MW1706 (APEC 4), ONW6, MW1701 and MW1703 (APEC 6).

Notes: * TDS calculated from EC readings: EC x 0.65

11.2 Analytical Results

11.2.1 Soil

Sample location and analytical results for soil samples are presented in the following attached Table and Figures.

- **Table T1a** Laboratory Analytical Results – PFAS Concentrations Detected in Soil
- **Table T1b** Laboratory Analytical Results – Hydrocarbon Concentrations Detected in Soil
- **Figures 2a** Sampling and Monitoring Well Locations – APEC 1, 2, 3a and 3b
- **Figures 2b** Sampling and Monitoring Well Locations – APEC 4, 5 and 6
- **Figure 4a** Soil Analytical Results - APEC 3b
- **Figure 4b** Soil Analytical Results - APEC 4
- **Figure 4c** Soil Analytical Results - APEC 5
- **Figure 4d** Soil Analytical Results - APEC 6

PFAS concentrations in all soil and sediment samples were reported less than the adopted assessment criteria for human health at all locations within each APEC.

PFAS concentrations in all soil samples were reported less than the adopted ecological assessment criteria at all locations sampled within each APEC.

PFOS concentrations in all soil and sediment samples were reported less than the adopted assessment criteria for human health and ecological health at all locations within each APEC.

Reported concentrations of TRH/ BTEXN were less than the LOR in all samples analysed except for SB1714 (APEC 3B) and SB1725 (APEC 4) which were both below the adopted human and ecological health screening criteria.

11.2.2 Surface Water

Sample location and analytical results for groundwater samples are presented in the following attached Table and Figures.

- **Table T5a** Laboratory Analytical Results – PFAS Concentrations Detected in Surface Water
- **Table T5b** Hydrocarbon Concentrations Detected in Surface Water
- **Figure 2a** Sampling and Monitoring Well Locations – APEC 1, 2, 3a and 3b
- **Figure 2b** Sampling and Monitoring Well Locations – APEC 4, 5 and 6
- **Figure 3** Surface Water Sampling Locations
- **Figure 5a** Groundwater and Surface Water Analytical Results - APEC 1
- **Figure 5b** Groundwater & Surface Water Analytical Results - APEC 2
- **Figure 5c** Groundwater & Surface Water Analytical Results - APEC 3a
- **Figure 5e** Groundwater & Surface Water Analytical Results - APEC 4
- **Figure 5f** Groundwater & Surface Water Analytical Results - APEC 5
- **Figure 5g** Groundwater & Surface Water Analytical Results - APEC 6
- **Figure 5h** Groundwater & Surface Water Analytical Results – Locations Outside of APECs (Overall)

PFAS impacts in surface water were observed within all APECs except for APEC 3b (no surface water samples collected), with PFAS concentrations reported above the adopted assessment criteria summarised in **Table 17** below.

Table 17 PFAS impacts exceeding adopted screening criteria in surface water samples

Adopted Screening Criteria*	Analyte			
	PFOA	PFOS	PFHxS	Sum (PFHxS + PFOS)
DoH (2017) Drinking water	APEC 3A: SW1720			APEC 1: SW05
				APEC 2: SW1717, SW1718
				APEC 3A: SW1720
				APEC 4: SW1721
				APEC 5: SW1722, SW1723, SW1724
				APEC 6: SW1703, SW1704, SW1706
				Overall: SW1702, SW1705, SW1708, SW1709, SW1710, SW1714
WA DER (2017) Drinking Water				APEC 2: SW1717, SW1718
				APEC 3A: SW1720
				APEC 5: SW1722, SW1724
				Overall: SW1705, SW1708, SW1709, SW1714
WA DER (2017) Non-Potable Use and Recreational		APEC 2: SW1717		APEC 2: SW1717
		APEC 3A: SW1720		APEC 3A: SW1720
				APEC 5: SW1722
WA DER 2017 Highly disturbed systems FW 90% species protection		APEC 2: SW1717	APEC 2: SW1717	APEC 2: SW1717, SW1718
		APEC 3A: SW1720		APEC 3A: SW1720
		APEC 5: SW1722, SW1724		APEC 5: SW1722, SW1724
		Overall: SW1708		Overall: SW1708
WA DER 2017 Highly disturbed systems FW 80% species protection		APEC 3A: SW1720		APEC 3A: SW1720
Airservices (GHD) (2015) EISLs (toxicity effects on aquatic organisms)		APEC 3A: SW1720		APEC 3A: SW1720

* TRH/BTEXN concentrations were generally below LOR (with low concentrations at SW1720, SW1722, SW1704 and SW1707) and did not exceed adopted screening criteria.

11.2.3 Groundwater

Sample location and analytical results for groundwater samples are presented in the following attached Table and Figures.

- **Table T6a** Laboratory Analytical Results – PFAS Concentrations Detected in Groundwater
- **Table T6b** Hydrocarbon Concentrations Detected in Groundwater
- **Figures 2a** Sampling and Monitoring Well Locations – APEC 1, 2, 3a and 3b
- **Figures 2b** Sampling and Monitoring Well Locations – APEC 4, 5 and 6
- **Figure 5a** Groundwater & Surface Water Analytical Results - APEC 1
- **Figure 5b** Groundwater & Surface Water Analytical Results - APEC 2
- **Figure 5c** Groundwater & Surface Water Analytical Results - APEC 3a
- **Figure 5d** Groundwater & Surface Water Analytical Results - APEC 3b
- **Figure 5e** Groundwater & Surface Water Analytical Results - APEC 4
- **Figure 5f** Groundwater & Surface Water Analytical Results - APEC 5
- **Figure 5g** Groundwater & Surface Water Analytical Results - APEC 6
- **Figure 5h** Groundwater & Surface Water Analytical Results – Locations Outside of APECs (Overall)

PFAS impacts in groundwater were observed within all APECs and at selected down-gradient monitoring well locations, with PFAS concentrations reported above the adopted assessment criteria summarised in the **Table 18**.

Table 18 PFAS impacts exceeding adopted screening criteria in groundwater

Screening Criteria	Analyte			
	PFHxS	PFOA	PFOS	Sum (PFHxS + PFOS)
DoH (2017) Drinking water		APEC 1: MW22, MW29, MW35		APEC 1: MW22, MW26, MW29, MW34, MW35, MW37
		APEC 2: MW0220		APEC 2: MW0220, MW0221
		APEC 3A: MW-FTG1, MW-FTG2, MW-FTG3		APEC 3A: MW-FTG1, MW-FTG2, MW-FTG3
		APEC 3B: MW0216, MW1708		APEC 3B: MW0216, MW1708
				APEC 4: ONW5
				APEC 5: ME1704, MW1705, MW0179, MW0179D
				APEC 6: MW1701, MW1702, MW1703, ONW6
				Overall: MW0120N, MW0135, MW0172, MW0180
WA DER (2017) Drinking Water				APEC 1: MW22, MW26, MW29, MW34, MW35, MW37
		APEC 2: MW0220		APEC 2: MW0220, MW0221
		APEC 3A: MW-FTG1, MW-FTG2, MW-FTG3		APEC 3A: MW-FTG1, MW-FTG2, MW-FTG3
		APEC 3B: MW0216, MW1708		APEC 3B: MW0216, MW1708
				APEC 4: ONW5
				APEC 5: MW1704, MW1705, MW0179D
				APEC 6: MW1701, MW1702, MW1703
				Overall: MW0180, MW0172

Screening Criteria	Analyte			
	PFHxS	PFOA	PFOS	Sum (PFHxS + PFOS)
WA DER (2017) Non-Potable Use and Recreational	APEC 1: MW22, MW29, MW34, MW35		APEC 1: MW22, MW26, MW29, MW34, MW35	APEC 1: MW22, MW26, MW29, MW34, MW35
	APEC 2: MW0220		APEC 2: MW0220	APEC 2: MW0220
	APEC 3A: MW-FTG1, MW-FTG2, MW-FTG3	APEC 3A: MW-FTG2	APEC 3A: MW-FTG1, MW-FTG2, MW-FTG3	APEC 3A: MW-FTG1, MW-FTG2, MW-FTG3
	APEC 3B: MW0216, MW1708	APEC 3B: MW0216	APEC 3B: MW0216, MW1708	APEC 3B: MW0216, MW1708
	APEC 4: ONW5		APEC 4: ONW5	APEC 4: ONW5
	APEC 5: MW1704, MW0179D		APEC 5: ME1704, MW1705, MW0179D	APEC 5: MW1704, MW0179D
				APEC 6: MW1702
				Overall: MW0172
WA DER 2017 Highly disturbed systems FW 90% species protection	APEC 1: MW22, MW29, MW34, MW35		APEC 1: MW22, MW26, MW29, MW34, MW35	APEC 1: MW22, MW26, MW29, MW34, MW35
	APEC 2: MW0220			APEC 2: MW0220
	APEC 3A: MW-FTG1, MW-FTG2, MW-FTG3		APEC 3A: MW-FTG1, MW-FTG2, MW-FTG3	APEC 3A: MW-FTG1, MW-FTG2, MW-FTG3
	APEC 3B: MW0216, MW1708		APEC 3B: MW0216, MW1708	APEC 3B: MW0216, MW1708
	APEC 4: ONW5			APEC 4: ONW5
	APEC 5: MW1704, MW0179D		APEC 5: ME1704, MW1705, MW0179D	APEC 5: MW1704, MW1705, MW0179D
			APEC 6: MW1702	APEC 6: MW1702
	Overall: MW0172			Overall: MW0172
WA DER 2017 Highly disturbed systems FW 80% species protection			APEC 1: MW22, MW29, MW35	APEC 1: MW22, MW29, MW35
	APEC 2: MW0220		APEC 2 MW0220	APEC 2: MW0220
	APEC 3A: MW-FTG1, MW-FTG2, MW-FTG3		APEC 3A: MW-FTG1, MW-FTG2	APEC 3A: MW-FTG1, MW-FTG2, MW-FTG3
	APEC 3B: MW0216, MW1708		APEC 3B: MW0216	APEC 3B: MW0216, MW1708
Airservices (GHD) (2015) EISLs (toxicity effects on aquatic organisms)			APEC 1: MW22, MW26, MW29, MW34, MW35	
			APEC 2: MW0216	
			APEC 3A: MW-FTG1, MW-FTG2, MW-FTG3	
			APEC 3B: MW0216, MW1708	
			APEC 4: ONW5	
			APEC 5: MW1704, MW0179D	

* TRH/BTEXN concentrations were below adopted screening criteria in all samples.

12.0 Updated Conceptual Site Model (CSM)

A preliminary CSM was developed as part of the PSI (AECOM, 2017a). The outcomes of the PSI identified several data gaps for each APEC, which were further refined in the SAQP (AECOM, 2017b). The limited sampling undertaken by AECOM in September to October 2017 in general accordance with the SAQP (AECOM, 2017b) addressed the following data gaps:

- The presence/absence of PFAS impacts in soil and/or sediment;
- The presence/absence of PFAS impacts in groundwater; and
- The presence/absence of PFAS impacts at the Site boundaries.

The updated CSM is provided in **Table 20** (below).

Best-practice risk-based contaminated site management involves the development of a conceptual site model (CSM) to examine the source, nature and extent of contamination and to evaluate the potential effects of contamination on human health and the environment. Land is considered to be 'contaminated' where there is a risk of harm, or potential harm, to human health, the environment or environmental values from a substance present at or above background concentrations.

The assessment of whether a site is 'contaminated' is founded on this risk-based approach; and the iterative development of the CSM. Development of the CSM is therefore a standard preliminary step in the process of human health and ecological risk assessment. For a particular contaminant to pose a risk to receptors, three components must exist:

- **Source** – A potentially hazardous substance that has been released into the environment;
- **Pathway** – the mechanism by which receptors may be exposed to the source or derivatives of the source;
- **Receptors** – The human or ecological component potentially at risk of experiencing an adverse response from exposure to the source, or derivatives of the source.

If one of these three components is missing from an exposure scenario, then there can be no risk.

The fundamental aim of the risk evaluation process is to identify any complete source-pathway-receptor (SPR) linkages that may present an unacceptable level of risk to a receptor; and to formulate an appropriate management strategy to mitigate identified risks to acceptable levels.

Based on the findings of desktop investigations, site inspections and site interviews conducted at the Site, a tabulated preliminary CSM is presented below (**Table 20**).

12.1 Potential Sources of Contamination

The current scope of works pertains to the historical use of AFFF by ARFF services at the Site. As such, the preliminary CSM focuses primarily on AFFF sources of contamination. However, as requested by Airservices, the CSM also identifies other COPC's related to ARFF activities.

Seven APECs are listed and detailed in the preliminary CSM presented in **Table 20** below, with the other APECs from **Table 10** above excluded. The exclusions are due to the wide spatial distribution of impacts (in the case of fire incident responses and the drainage networks) or because insufficient information was made available to confirm other specific locations of AFFF use or storage (in the case of fuel depots or within aircraft hangars).

AFFF related sources of contamination from ARFF operations are therefore further examined in **Table 20** as:

- APEC 1 Former Workshop and Tyre Store
- APEC 2 Former ARFF Fire Station
- APEC 3a Fire Training Ground
- APEC 3b Incinerator Building
- APEC 4 Current ARFF Fire Station
- APEC 5 Suspected Former Fire Training Area A
- APEC 6 Suspected Former Fire Training Area B

12.2 Potential Receptors

Potential receptors to AFFF related contamination at the Site are summarised in **Table 19**. Further details in relation to receptors exposed to potentially affected groundwater are provided in **Section 12.2.1**.

Table 19 Potential Receptors

Receptor(s)	Description
On-site workers / operators	Persons routinely working at the airport. The site is an operational airport and commercial and business precincts are present within the site boundary.
On-site intrusive maintenance workers	There is a potential for maintenance worker exposure, particularly where works require ground-breaking or excavation activities within APECs.
Down-gradient users of non-potable groundwater or surface water	Users of groundwater or surface water may be exposed to AFFF related contaminants in neighbouring properties. A large number of non-potable bores exist in the surrounding metropolitan area.
Aquatic and Terrestrial ecological receptors within waterways of the Airport and within receiving aquatic environments beyond the Airport boundaries	Invertebrates and macrofauna may be directly exposed. Higher order species (predation) may lead to wider exposure within the open and underground drainage channels of Perth Airport, and off-site waterways, including: • Munday Swamp • Limestone Creek • Helena River • Swan River • Sewer and stormwater networks
	The NMD is an open unlined channel for most of its length through the Airport estate and drains much of the Airport Central and Airport North areas towards the Swan River. Two smaller open channels within this catchment discharge into Munday Swamp. When this reaches capacity, overflow occurs into Limestone Creek, which flows directly to the Swan River.
	The North East catchment is a small catchment within the Airport estate. It is an underground piped network originating from the industrial area and neighbouring residential properties, which drain into the Helena River.
	The SMD is an open unlined channel for most of its length through the Airport estate, but flows through several culverts across the estate before being discharged into a reserve that drains into the Swan River.
	The Fauntleroy catchment is a small catchment within the Airport estate. It is an underground piped network for the majority of its length and drains into the Swan River.
	Discharge from numerous facilities, including overflow from the FTG facilities occurs to the trade waste and sewer system of the Perth Airport, presenting the potential for PFAS transport through the waste-water network.

Drinking water supplies in WA are protected under the *Metropolitan Water Supply Sewerage and Drainage Act 1909*. It is noted that the Site is not located within a Public Drinking Water Source Protection Area (PDWSA), with the closest PDWSA located approximately 6 km to the east of the Site. Since metropolitan Perth is supplied with a reticulated water supply, it is unlikely that residents near the Airport would use groundwater as a drinking water source; however, there remains the potential for private unregistered bores to be used for irrigation purposes. (AECOM, 2012b).

12.2.1 Licenced Groundwater Abstraction

The DoW maintains a Register of Licenced Extraction Bores. Search results from those records for the vicinity of the Airport are shown in **Appendix C - Figure C-1**. Groundwater abstraction within the Site is primarily for irrigation water supply for landscaped areas. The DoW records indicated that 31 licenced bores were located within a 500 metre radius of the Site boundary. These records represent groundwater abstraction bores and do not include bores installed for monitoring purposes.

12.2.2 Other Registered Groundwater Bores

The results of a groundwater bore search on the DoW, Water Information Reporting Database for registered bores found 150 bores within a 500 m radius from the Site boundary (**Appendix C – Figure C-2**). The on-Site network of monitoring bores is regularly monitored within the Site. A further set of groundwater monitoring wells exists within the Firefighting Training Ground, which is monitored by Airservices.

12.3 Potential Transport Mechanisms and Exposure Pathways

Potential mechanisms of contamination transport through soil, groundwater, vapour media and the environment include:

- Direct releases and/or spillages into the ground;
- Leaching of contaminants from impacted soils to groundwater;
- Lateral migration of contaminants in groundwater, in the direction of groundwater flow;
- Surface water run-off into drainage systems and the migration of contaminants within surface water catchments, either in soluble and/or soil/sediment adsorbed forms; and
- Ecological uptake in vegetation and/or fauna.

Potential exposure pathways between the key AFFF contaminant sources identified in **Section 12.1** and relevant receptors identified in **Section 12.2** include:

- Direct contact with impacted soils (including oral ingestion, dermal contact and dust inhalation);
- Direct contact with groundwater or impacted surface water (encountered or abstracted);
- Ingestion of home-grown produce (bio-accumulated uptake into plants and/or animals); and
- Direct discharge or migration of contaminants into surface waters.

12.4 Source, Pathway and Receptor Linkages

A tabulated representation of the preliminary CSM describing potential SPR linkages and based on the findings of this PSI report is provided in **Table 20**, which includes an assessment of the status of each identified SPR linkage for on-site and off-site receptors and an associated evaluation of residual data gaps relevant to each SPR linkage of concern.

The preliminary CSM identifies linkages as either *probable* or *possible*, based on the likelihood of occurrence and the availability of data. Probable indicates that the SPR linkage is more likely, whereas possible suggests that the SPR linkage may occur, although, there is insufficient information to determine if the linkage is credible.

Table 20 Preliminary Conceptual Site Model

APEC 1 & 2 - Former Workshop and Tyre Store, Former ARFF Fire Station							
Source	Transport Mechanisms	Exposure Pathway	Receptors	SPR Status	Data Gap	Discussion	Data Gap Status
Soils impacted from historical AFFF use from fire maintenance activities	Direct contact with historically impacted soils	Ingestion, dermal contact and dust inhalation	On-site intrusive maintenance workers	Probable	<u>The presence/absence of PFAS impacts in soil and/or sediment.</u>	- PFAS impacts were reported at concentrations in a number of samples greater than the LOR in both APECs. - Impacts did not exceed the adopted screening criteria and tended to be greater at deeper sample depths.	<u>Data gap considered closed based on the presence of PFAS in soil and sediment samples in and adjacent to APECs 1 and 2.</u> <u>It is noted that the SPR linkages remain possible based on the data collected during the limited sampling.</u>
			On-site Airport workers / operators	Unlikely based on sealed areas			
	Further migration in dissolved phase and/or adsorbed to soil/sediment	Direct contact with impacted ground water (Ingestion and dermal contact)	On-site intrusive maintenance workers	Probable	<u>The presence/absence of PFAS impacts in groundwater and/or surface water.</u>	- Surface water PFAS impacts reported in all samples collected with exceedances against screening criteria noted in each sample. - Groundwater flow is inferred to be in a north-westerly direction towards the Swan River.	<u>Data gap considered closed based on the presence of PFAS in groundwater and surface water samples in and adjacent to APECs 1 and 2.</u> <u>It is noted that the SPR linkages remain possible based on the data collected during the limited sampling.</u>
	Vertical infiltration of contaminants or leaching of (soil-bound) contaminants into groundwater and lateral migration of soluble contaminants in the direction of groundwater flow.		On-site Airport workers / operators	Possible			
	Further migration within receiving catchments – in dissolved form and/or adsorbed to soil/sediment.	Direct contact with impacted surface water or stormwater (Ingestion and dermal contact)	On-site Airport workers / operators	Possible			
	Contaminants in storm water run-off via discharge to drainage systems and further migration within receiving catchments (Fauntleroy Avenue Catchment and Swan River) – in dissolved form and/or adsorbed to soil/sediment.		On-site intrusive maintenance workers.	Probable			
				Down-gradient users of non-potable groundwater			
	Ecological uptake into vegetation and/or fauna, which may introduce more complex contaminant transport vectors, when food-chain or fauna mobility factors are considered.	Ingestion via harvest of home-grown produce or animals within the Fauntleroy Avenue Catchment and Swan River. (Ingestion)	Residential properties down-gradient of surface water flow	Probable			

APEC 3 – (a) Fire Training Ground (FTG) and (b) Incinerator Building							
Source	Transport Mechanisms	Exposure Pathway	Receptors	SPR Status	Data Gaps	Discussion	Data Gap Status
Soils impacted from historical AFFF use from fire training activities On-site soils impacted by current, TPH, TRH, Heavy Metals resulting from current fire training activities	Direct spills or releases of contaminants into soil profiles	Direct contact with historically impacted soils (Ingestion, dermal contact, and dust inhalation).	On-site intrusive maintenance workers	Probable	The presence/absence of PFAS impacts in soil and/or sediment.	APEC 3b ³ . Incinerator Building Soil samples collected around the old incinerator building indicate PFAS impacts present but do not exceed the adopted screening criteria	Data gap considered closed based on the presence of PFAS in soil samples in and adjacent to APECs 3b. It is noted that the SPR linkages remain possible based on the data collected during the limited sampling.
			On-site Airport workers / operators	Possible			
	Further migration in dissolved phase and/or adsorbed to soil/sediment. Vertical infiltration of contaminants or leaching of (soil-bound) contaminants into groundwater and lateral migration of soluble contaminants in the direction of groundwater flow.	Direct contact with impacted groundwater (Ingestion and dermal contact)	On-site intrusive maintenance workers	Possible	The presence/absence of PFAS impacts in groundwater and/or surface water.	APEC 3.a. Fire Training Ground - The discharge from the receiving pond is monitored quarterly and indicates PFAS impacts discharging to the sewerage system. - TPH/ TRH, BTEXN impacts are noted in the groundwater wells, however, no TPH/TRH or BTEXN concentrations were reported above LOR in the soil surrounding the cleared area of the FTG. - Groundwater flow is inferred to be in a north-westerly direction towards the Swan River. - PFAS impacts exceeding adopted screening criteria are reported within the three groundwater monitoring wells at the FTG. APEC 3b. Incinerator Building - PFAS impacts were detected at newly installed MW1708 and pre-existing MW0216 with exceedances against the adopted screening criteria noted in both.	Data gap considered closed based on the presence of PFAS in groundwater and surface water samples in and adjacent to APECs 3a and 3b. It is noted that the SPR linkages remain possible based on the data collected during the limited sampling.
			On-site Airport workers / operators	Possible			
			Down-gradient users of non-potable groundwater	Possible			
	Contaminants in storm water run-off via discharge to drainage systems and further migration within receiving catchments (e.g. via Northern Main Drain Catchment which drains to the Swan River) – in dissolved form and/or adsorbed to soil/sediment.	Direct contact with impacted surface water or stormwater (Ingestion and dermal contact)	On-site intrusive maintenance workers	Probable			
			On-site Airport workers / operators	Probable			
			Residential property and public areas hydraulically down-gradient	Probable			
			Ecological receptors	Probable			
	Ecological uptake into vegetation and/or fauna, which may introduce more complex contaminant transport vectors, when food-chain or fauna mobility factors are considered.	Ingestion via harvest of irrigated home-grown produce or animals. (Ingestion)	On-site Airport workers / operators	Possible			
			Down-gradient users of non-potable groundwater or surface water	Possible			

³ No soil/sediment sampling conducted in APEC 3a as per the SAQP (AECOM 2017b).

APEC 4 – Current ARFF Fire Station							
Source	Transport Mechanisms	Exposure Pathway	Receptors	SPR Status	Data Gaps	Discussion	Data Gap Status
Diesel AST and Solberg Form stored Potential Soil Impacts associated with storage and handling of Diesel include: TPH, TRH and BTEXN	Direct spills or releases of contaminants into soil profiles	Direct contact with historically impacted soils (Ingestion, dermal contact and dust inhalation).	On-site intrusive maintenance workers	Probable	<u>The presence/absence of PFAS impacts in soil and/or sediment.</u>	Samples collected from soil bores indicate PFAS impacts but no exceedances of screening criteria were noted.	<u>Data gap considered closed based on the presence of PFAS in soil samples in and adjacent to APEC 4.</u> <u>It is noted that the SPR linkages remain possible based on the data collected during the limited sampling.</u>
			On-site Airport workers / operators	Possible			
	Further migration in dissolved phase and/or adsorbed to soil/sediment	Direct contact with impacted ground water (Ingestion and dermal contact)	On-site intrusive maintenance workers	Probable	<u>The presence/absence of PFAS impacts in groundwater and/or surface water.</u>	- The newly installed MW1706 noted PFAS impacts but no exceedances of the adopted screening criteria. The adjacent ONW5 to the east of APEC 4 also noted PFAS impacts and had exceedances of the adopted screening criteria. - Surface water sampled to the south east of APEC 4 noted PFAS impacts and had exceedances against the adopted screening criteria.	<u>Data gap considered closed based on the presence of PFAS in groundwater and surface water samples in and adjacent to APEC 4.</u> <u>It is noted that the SPR linkages remain possible based on the data collected during the limited sampling.</u>
	Vertical infiltration of contaminants or leaching of (soil-bound) contaminants into groundwater and lateral migration of soluble contaminants in the direction of groundwater flow.		On-site Airport workers / operators	Probable			
			Down-gradient users of non-potable groundwater	Possible			
	Contaminants in storm water run-off or in wash water via discharge to drainage systems and further migration (via Northern Main Drain Catchment which drains to the Swan River) – in dissolved form and/or adsorbed to soil/sediment.	Direct contact with impacted surface water or stormwater (Ingestion and dermal contact)	On-site Airport workers / operators	Possible			
			Residential property and public areas hydraulically down-gradient	Possible			
			Ecological receptors	Possible			

APEC 5 & 6 – Suspected Former Fire Training Areas (A and B)							
Source	Transport Mechanisms	Exposure Pathway	Receptors	SPR Status	Data Gaps	Discussion	Data Gap Status
On-site soils impacted by AFFF, resulting from fire training activities	Direct spills or releases of contaminants into soil profiles	Direct contact with historically impacted soils (Ingestion, dermal contact and dust inhalation).	On-site intrusive maintenance workers	Probable	<u>The presence/absence of PFAS impacts in soil and/or sediment.</u>	APEC 5: - PFAS impacts were detected in each of the soil bores at APEC 5, with all samples returning results greater than LOR except for SB1721_0.0-0.1. No exceedances against adopted screening criteria were noted. APEC 6: - Limited PFAS impacts were detected in four of the ten soil bores advanced with no exceedances to adopted screening criteria noted.	<u>Data gap considered closed based on the presence of PFAS in soil samples in and adjacent to APEC 4.</u> <u>It is noted that the SPR linkages remain possible based on the data collected during the limited sampling.</u>
			On-site Airport workers / operators	Possible			
	Further migration within receiving catchments – in dissolved phase and/or adsorbed to soil/sediment. Vertical infiltration of contaminants or leaching of (soil-bound) contaminants into groundwater and lateral migration of soluble contaminants in the direction of groundwater flow.	Direct contact with impacted ground water (Ingestion and dermal contact)	On-site intrusive maintenance workers	Probable	<u>The presence/absence of PFAS impacts in groundwater and/or surface water.</u>	APEC 5: - PFAS impacts were detected in each of the monitoring wells within and adjacent to APEC 5, with exceedances against the adopted screening criteria noted in each. - Surface water samples were collected from drainage to the east, west and north east of the APEC with PFAS concentration exceeding the adopted screening criteria noted in each. APEC 6: - PFAS impacts were detected in each of the newly installed wells and existing well with exceedances against the adopted screening criteria noted in all samples. - Surface water samples were collected from the east and the west of APEC 6 with PFAS compounds detected in each of the samples and exceedances against the screening criteria in each of the samples collected to the west of APEC 6 (SW1704 and SW1706).	<u>Data gap considered closed based on the presence of PFAS in groundwater and surface water samples in and adjacent to APEC 5 and 6.</u> <u>It is noted that the SPR linkages remain possible based on the data collected during the limited sampling.</u>
			On-site Airport workers / operators	Possible			
			Down-gradient users of non-potable groundwater	Possible			
	Contaminants in storm water run-off via discharge to drainage systems and further migration within receiving catchments (Southern Main Drain Catchment which drains to the Swan River) – in dissolved form and/or adsorbed to soil/sediment.	Direct contact with impacted surface water or stormwater (Ingestion and dermal contact)	On-site intrusive maintenance workers	Probable			
			On-site Airport workers / operators	Probable			
			Residential property and public areas hydraulically down-gradient	Possible			
			Ecological receptors	Possible			
	Ecological uptake into vegetation and/or fauna, which may introduce more complex contaminant transport vectors, when food-chain or fauna mobility factors are considered.	Ingestion via harvest of irrigated home-grown produce or animals. (Ingestion)	On-site Airport workers / operators	Possible			
			Residential property and public areas hydraulically down-gradient	Possible			

13.0 Conclusions

13.1 Summary of Findings

The PSI documented that multiple areas may have been impacted by historical AFFF use at the Site before and during the presence of Airservices on the Site since 1995, including:

- Fuels and AFFF were used at the FTG in training exercises. Intrusive investigations undertaken by GHD in 2008 confirmed TRH, PAHs, PFOS and PFOA were present in surface soils at the FTG.
- AFFF was stored at the former ARFF fire station between approximately 1980 and 2010. Investigations by AECOM prior to the demolition of the former Fire Station area confirmed PFAS in soils and concrete. Demolition and remediation work wastes from that project remain stored in sealed stockpiles in the Airport North area.
- PFAS has also been confirmed in groundwater in the vicinity of the Former Workshop and Tyre Store located in the Airport West commercial/industrial precinct, west of the T3/T4 complex.
- PFAS has been identified in soil, concrete, sediment and surface water across various other locations, confirming a relatively widespread distribution of PFAS at the Site, not necessarily solely related to ARFF activities, given the presence of other non-ARFF PFAS related sources. This extent of PFAS distribution has been exaggerated as a result of the abstraction and reticulation of groundwater for irrigation purposes and by the hydraulic interaction between shallow groundwater and the open channel drainage network.

The results of the limited sampling indicated:

- PFAS concentrations in all soil samples were reported less than the adopted assessment criteria for human health at all locations sampled within each APEC.
- PFAS concentrations in all soil samples were reported less than the adopted assessment criteria for ecological health at all locations sampled within each APEC sampled.
- Reported recoverable hydrocarbon concentrations in soil samples were reported at concentrations either less than the laboratory LOR or the adopted assessment criteria for human and environmental health at all locations within each APEC.
- PFAS concentrations in surface water were greater than the adopted assessment criteria for human and environmental health within all APECs where surface water was sampled.
- PFAS concentrations in groundwater were greater than the adopted assessment criteria for human and environmental health within all APECs and at selected down-gradient monitoring well locations.
- Reported recoverable hydrocarbon concentrations did not exceed the adopted HSL for surface water and groundwater samples.

13.2 Conclusions

Based on the information obtained as part of the PSI and limited sampling, the following conclusions can be made:

- The data gaps determined in the SAQP (AECOM 2017b) have been assessed and closed:
 - **Data Gap 1:** PFAS concentrations are marginally present in soil in the areas investigated.
 - **Data Gap 2:** PFAS impacts are present in groundwater and surface water in the areas investigated.
 - **Data Gap 3:** PFAS impacts are present at the Site boundary in surface water and present in groundwater at the APEC boundaries.
- The updated CSM indicates that SPR linkages remain “possible” to “probable” based on the data collected during the limited sampling.

14.0 Key References

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QED (2009a) Ground Water and Soil Quality Testing, Fire Training Facility, Perth Domestic Airport, July 2009;

QED (2009b) Ground Water and Soil Quality Testing, Fire Training Facility, Perth Domestic Airport, October 2009

QED (2009c) Industrial Discharge Water Quality Testing, Fire Training Facility, Perth Domestic Airport, October 2009;

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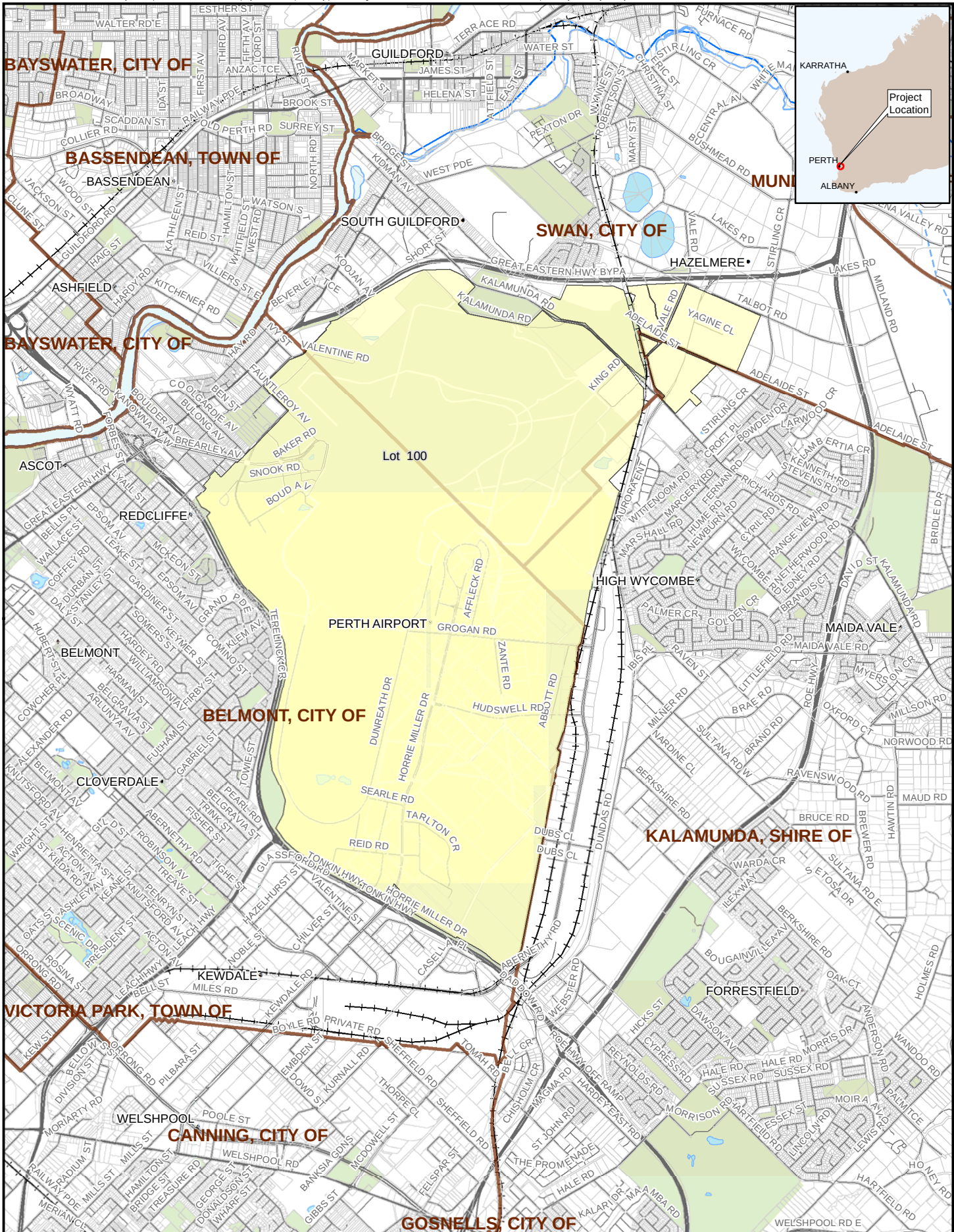
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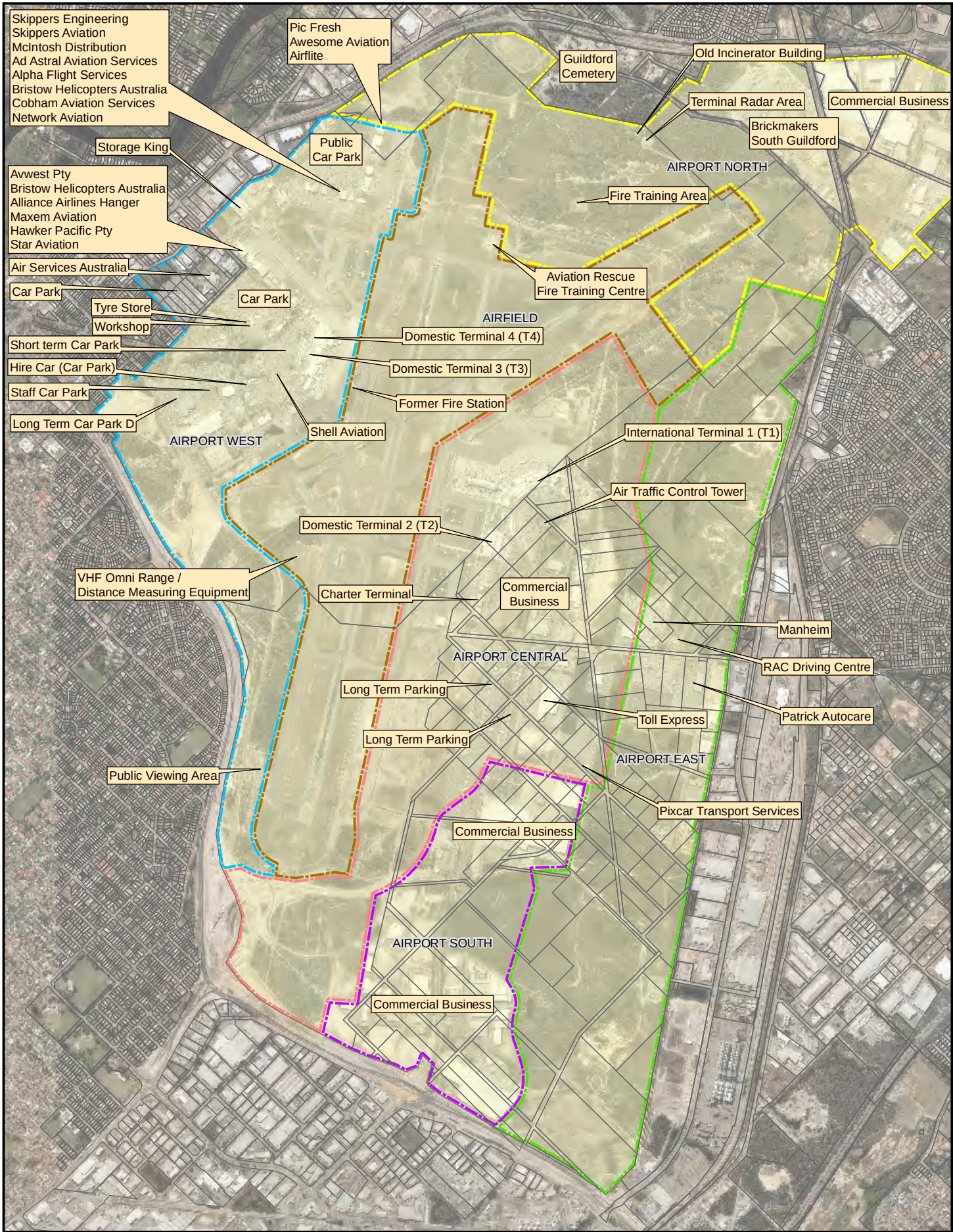
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Figures



PROJECT ID 60543717 CREATED BY [Logo] APPROVED BY BEismen LAST MODIFIED 09 FEB 2018 AECOM www.aecom.com DATUM GDA 1994, PROJECTION MGA ZONE 50 0 0.5 1 1.5 2 Kilometers 1:50,000 when printed at A4	LEGEND - Perth Airport Estate - Cadastral Boundary - Parks - Lakes - Watercourses - Highway - Major Road - Minor Road - Track - Railways Data sources: Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).	Site Location AIRSERVICES AUSTRALIA PSI AND LIMITED SAMPLING, PERTH AIRPORT	Figure 1a
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LEGEND

Perth Airport Estate

Cadastral Boundary

Zones

- Airfield
- Airport Central
- Airport East
- Airport North
- Airport South
- Airport West

Map sources:
Landgate Imagery (Feb. 2016)

Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).

Site Layout

AIRSERVICES AUSTRALIA

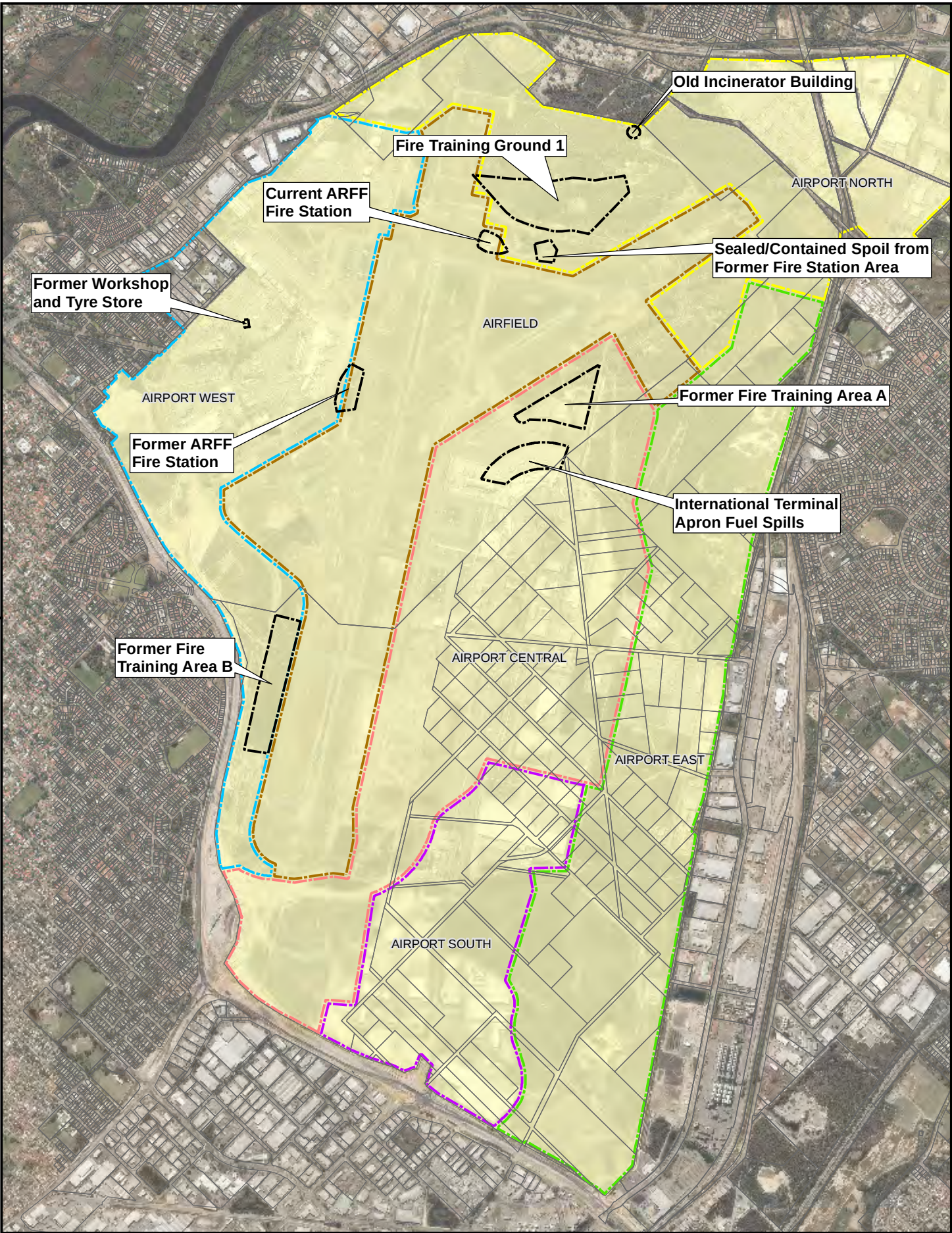
PSI AND LIMITED SAMPLING, PERTH AIRPORT

Figure

1b

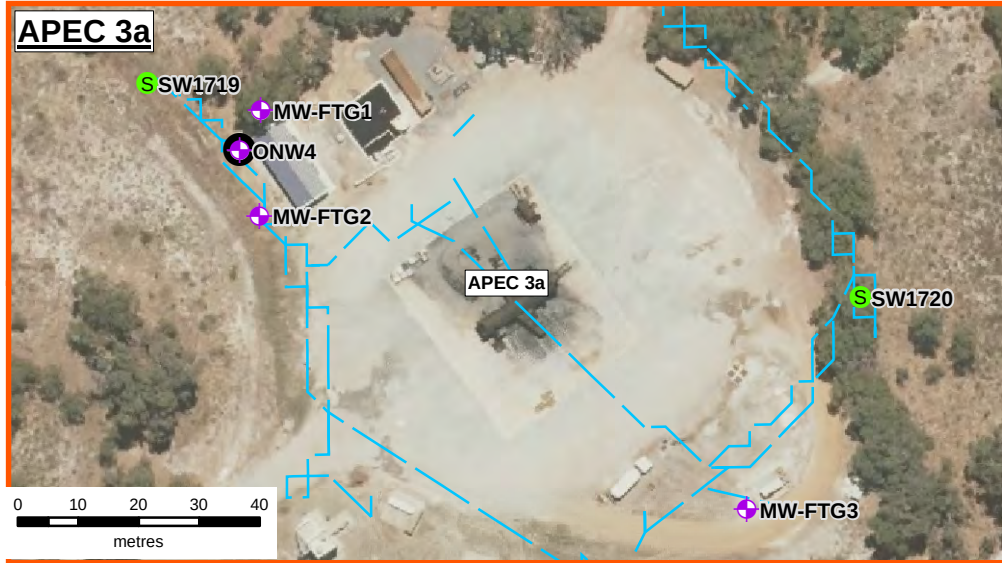
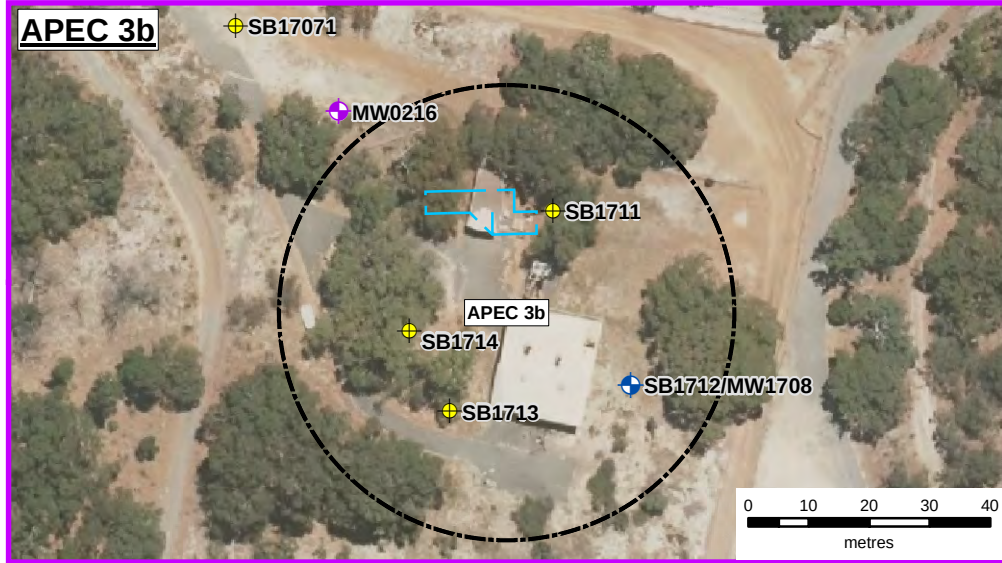
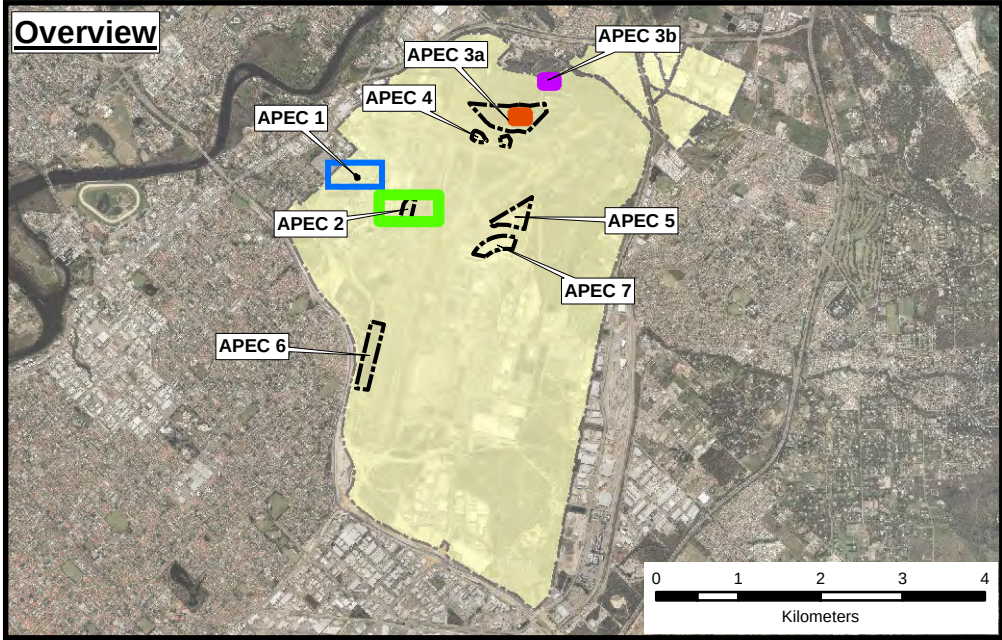
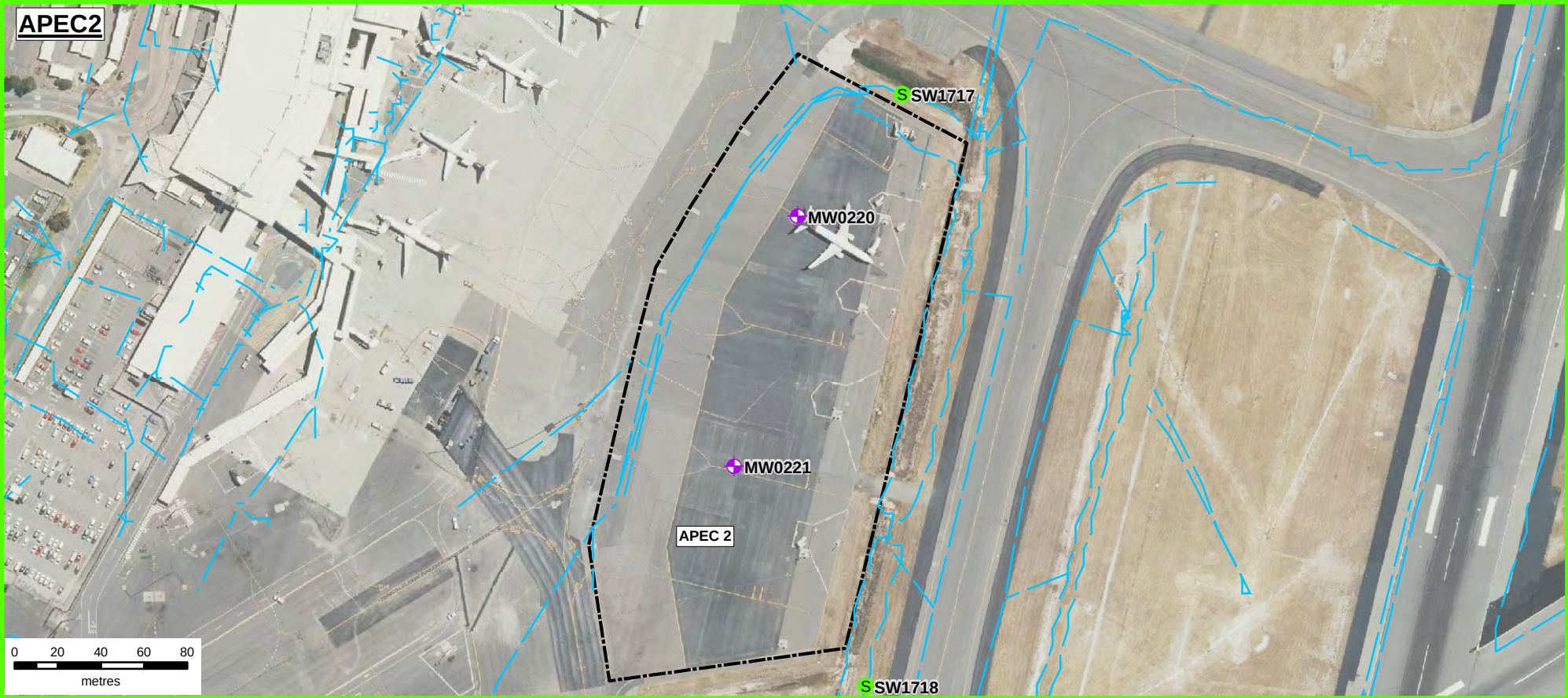
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A4 size



PROJECT ID 60543717 CREATED BY [Redacted] APPROVED BY BEIsman LAST MODIFIED 09 FEB 2018 AECOM www.aecom.com DATUM GDA 1994, PROJECTION MGA ZONE 50 0 200 400 600 800 metres 1:30,000 when printed at A4	LEGEND Perth Airport Estate Areas of Potential Concern Cadastral Boundary Zones Airfield Airport Central Airport East Airport North Airport South Airport West Data sources: Landgate Imagery (Feb. 2016) Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).	Areas of Potential Environmental Concern	
		AIRSERVICES AUSTRALIA PSI AND LIMITED SAMPLING, PERTH AIRPORT	Figure 1c

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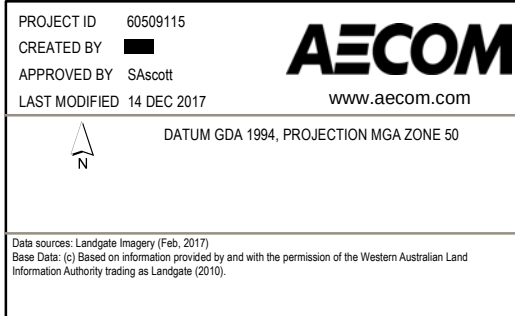
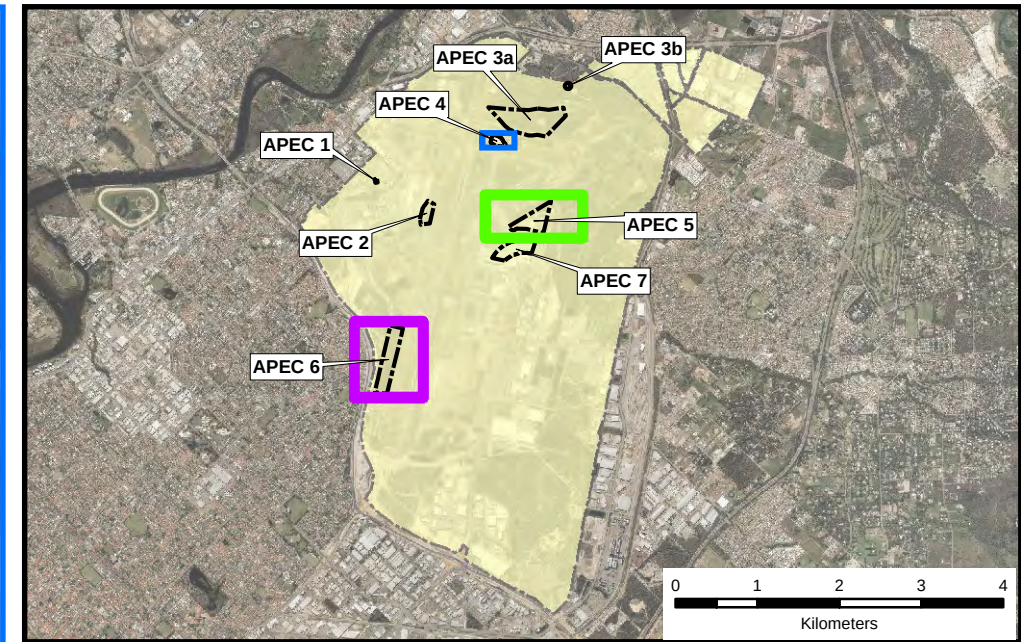


PROJECT ID 60509115 CREATED BY [Redacted] APPROVED BY SAscott LAST MODIFIED 14 DEC 2017 DATUM GDA 1994, PROJECTION MGA ZONE 50 Data sources: Landgate Imagery (Feb, 2017) Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).	AECOM www.aecom.com	LEGEND - Existing Monitoring Well - Monitoring Well (AECOM, 2017) - Surfacewater Sampling Location (AECOM, 2017) - Soil Bore (AECOM, 2017) - Wells Not Located / Sampled - Areas of Potential Environmental Concern - Perth Airport Estate - Surface Water Drainage Open and Underground	Notes: - MW0120, MW0135, MW0147 - Not Sampled Data Logger In Bore - MW0120N - Data Logger installed in MW0120, sampled well further north picked up with no Well ID on well - MW0123 (MB12s) - Not Sampled (not accessible due to flooding) - ONW4 - Not Found/Located - SW1719 - Dry	Samplings and Monitoring Well Locations - APEC 1 and 2, 3a and 3b AIRSERVICES AUSTRALIA PSI AND LIMITED SAMPLING, PERTH AIRPORT	Figure 2a
---	--	--	--	---	--------------------------------

This aerial map displays the APEC 4 site, which is outlined by a thick black dashed line. The site includes several buildings, a parking lot, and a road. Key features and labels include:

- SB1724/MW1706**: A blue diamond marker with a crosshair, located near the top left of the site.
- SB1725**: A yellow diamond marker with a crosshair, located near the top right of the site.
- SB1723**: A yellow diamond marker with a crosshair, located on the left side of the site.
- SB1722**: A yellow diamond marker with a crosshair, located at the bottom of the site.
- APEC 4**: A white rectangular label with a black border, located in the center of the site.
- ONW5**: A purple diamond marker with a crosshair, located to the right of the site, near a road and some trees.

A scale bar at the bottom left indicates distances in metres, ranging from 0 to 40. The map also shows surrounding fields, roads, and a small airplane on the right side.



 Areas of Potential Environmental Concern
 Perth Airport Estate
 Surface Water Drainage Open and Underground

Notes:

MW0120, MW0135, MW0147 - Not Sampled Data Logger In Bore

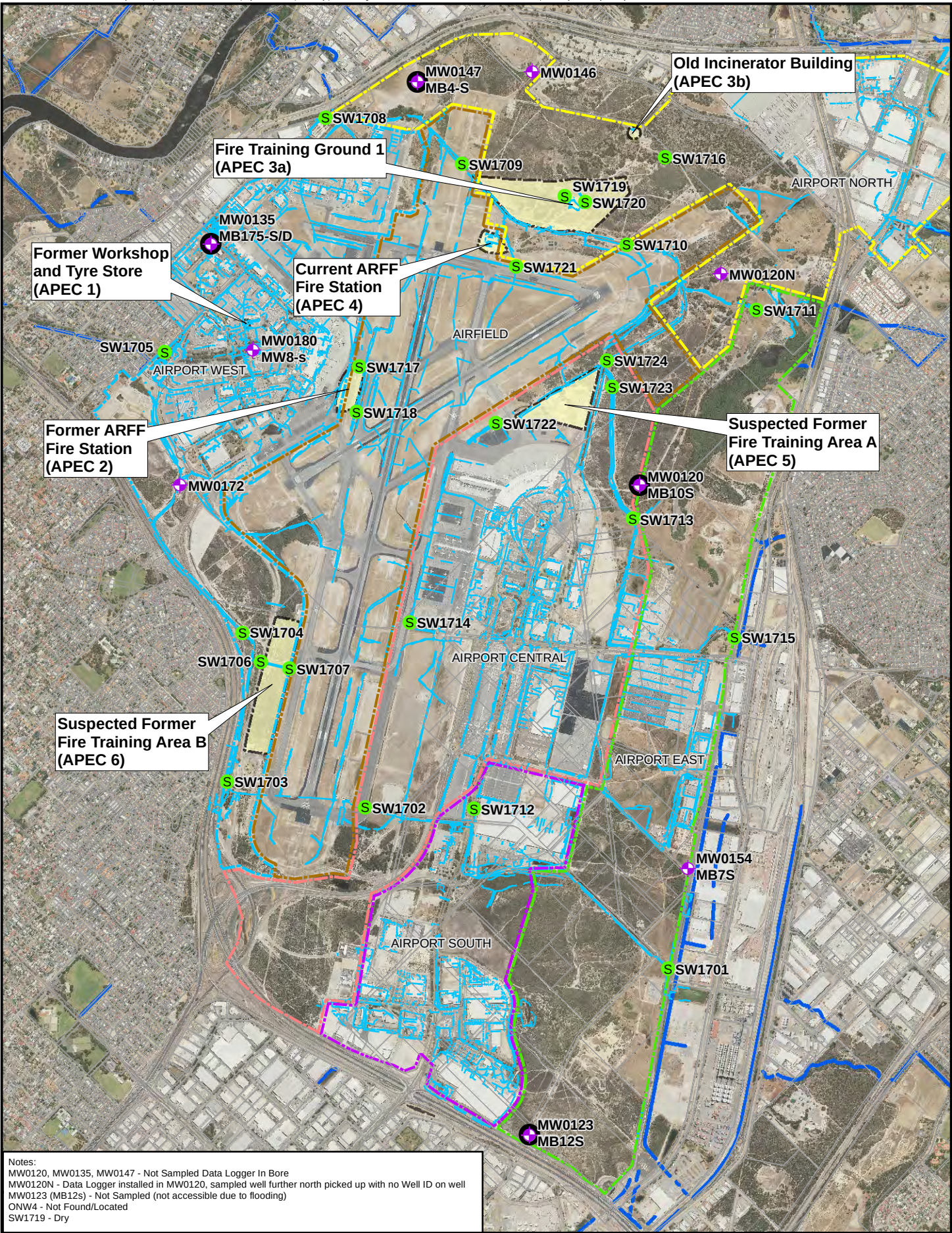
MW0120N - Data Logger installed in MW0120, sampled well further north picked up with no Well ID on well

MW0123 (MB12s) - Not Sampled (not accessible due to flooding)

ONW4 - Not Found/Located

SW1719 - Dry

2b



PROJECT ID 60543717
CREATED BY [Logo]
APPROVED BY CRitchie
LAST MODIFIED 02 MAR 2018

AECOM
www.aecom.com

1:30,000 when printed at A4
DATUM GDA 1994, PROJECTION MGA ZONE 50
0 200 400 600 800 metres

Data sources:
Landgate Imagery (Feb. 2017)
Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).

LEGEND

- Existing Monitoring Well
- Surfacewater Sampling Location (AECOM, 2017)
- Surface Water Drainage Open and Underground
- Drain - major (DoW)
- Areas of Potential Concern
- Cadastral Boundary

Zones

- Airfield
- Airport Central
- Airport East
- Airport North
- Airport South
- Airport West

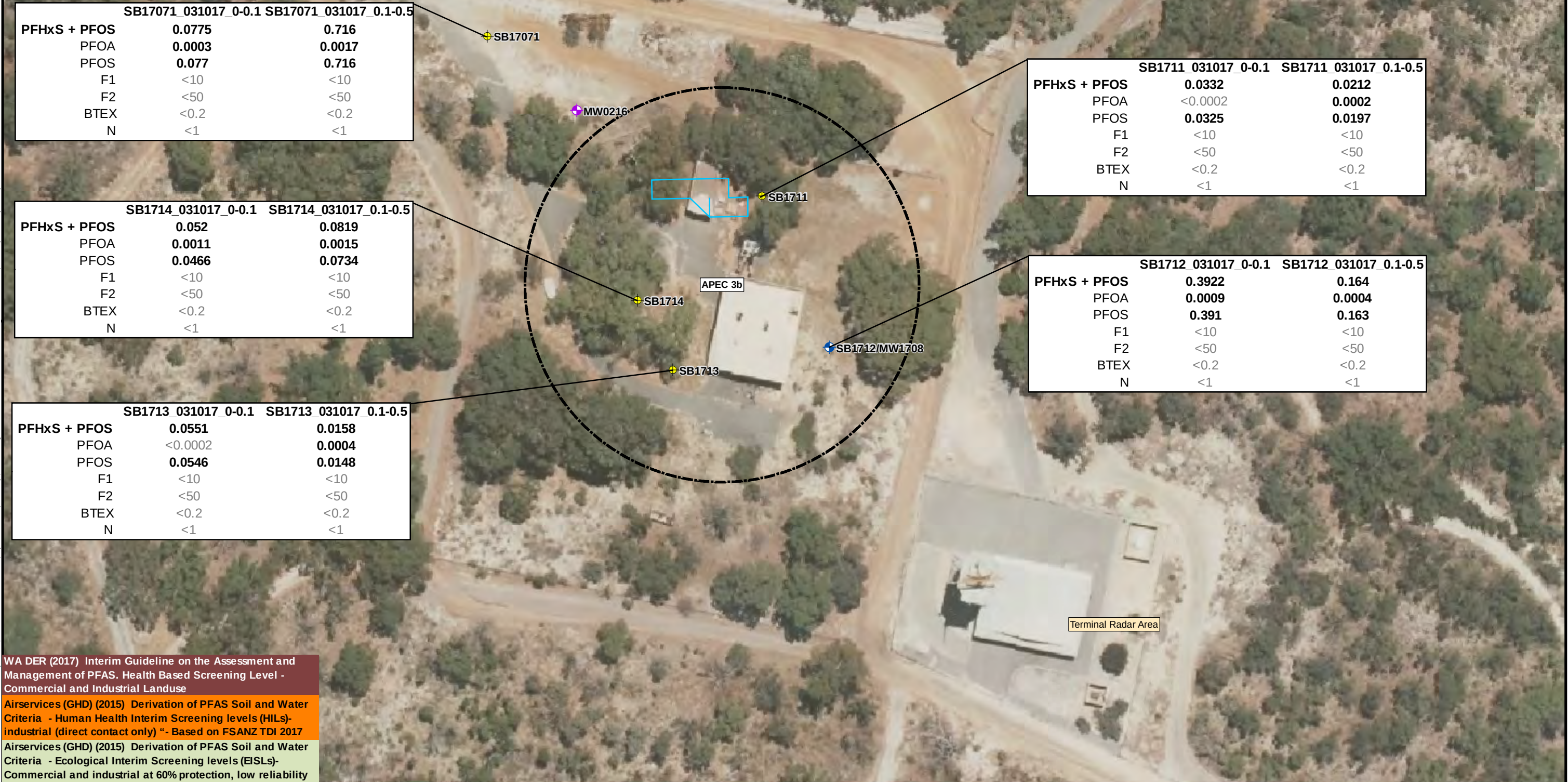
Monitoring Wells Outside of APECs and Airport Wide Surfacewater Sampling Locations

AIRSERVICES AUSTRALIA

PSI AND LIMITED SAMPLING, PERTH AIRPORT

Figure 3

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PROJECT ID60543717

CREATED BY

APPROVED BYCRitchie

LAST MODIFIED02 MAR 2018

1:750 (when printed at A3)

DATUM GDA 1994, PROJECTION MGA ZONE 50

0 10 20 30 40 metres

Data sources: Landgate Imagery (Feb, 2017)

Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).

Existing Monitoring Well

Monitoring Well (AECOM, 2017)

Surfacewater Sampling Location (AECOM, 2017)

Soil Bore (AECOM, 2017)

Wells Not Located / Sampled

Areas of Potential Environmental Concern

Perth Airport Estate

Surface Water Drainage Open and Underground

PFOS = Perfluorooctane sulfonic acid

PFOS + PFHxS = Sum of Perfluorooctane sulfonic acid and Perfluorohexane sulfonic acid

PFOA = Perfluorooctanoic acid

F1 = C6-C10 fraction (minus BTEX)(F1)

F2 = >C10-C16 (minus Naphthalene)(F2)

BTEX = Total BTEX

N = Naphthalene

All units are in mg/kg

- not analysed

* = duplicate sample value adopted for conservatism

** = triplicate sample value adopted for conservatism

Notes:

MW0120, MW0135, MW0147 - Not Sampled Data Logger In Bore

MW0120N - Data Logger installed in MW0120, sampled well further north picked up with no Well ID on well

MW0123 (MB12s) - Not Sampled (not accessible due to flooding)

ONW4 - Not Found/Located

SW1719 - Dry

It is noted that the APEC boundaries were broadly identified based on historical land use activities and are not directly correlated with the current Airservices lease areas.

Soil Analytical Results - APEC 3b

AIRSERVICES AUSTRALIA

PSI AND LIMITED SAMPLING, PERTH AIRPORT

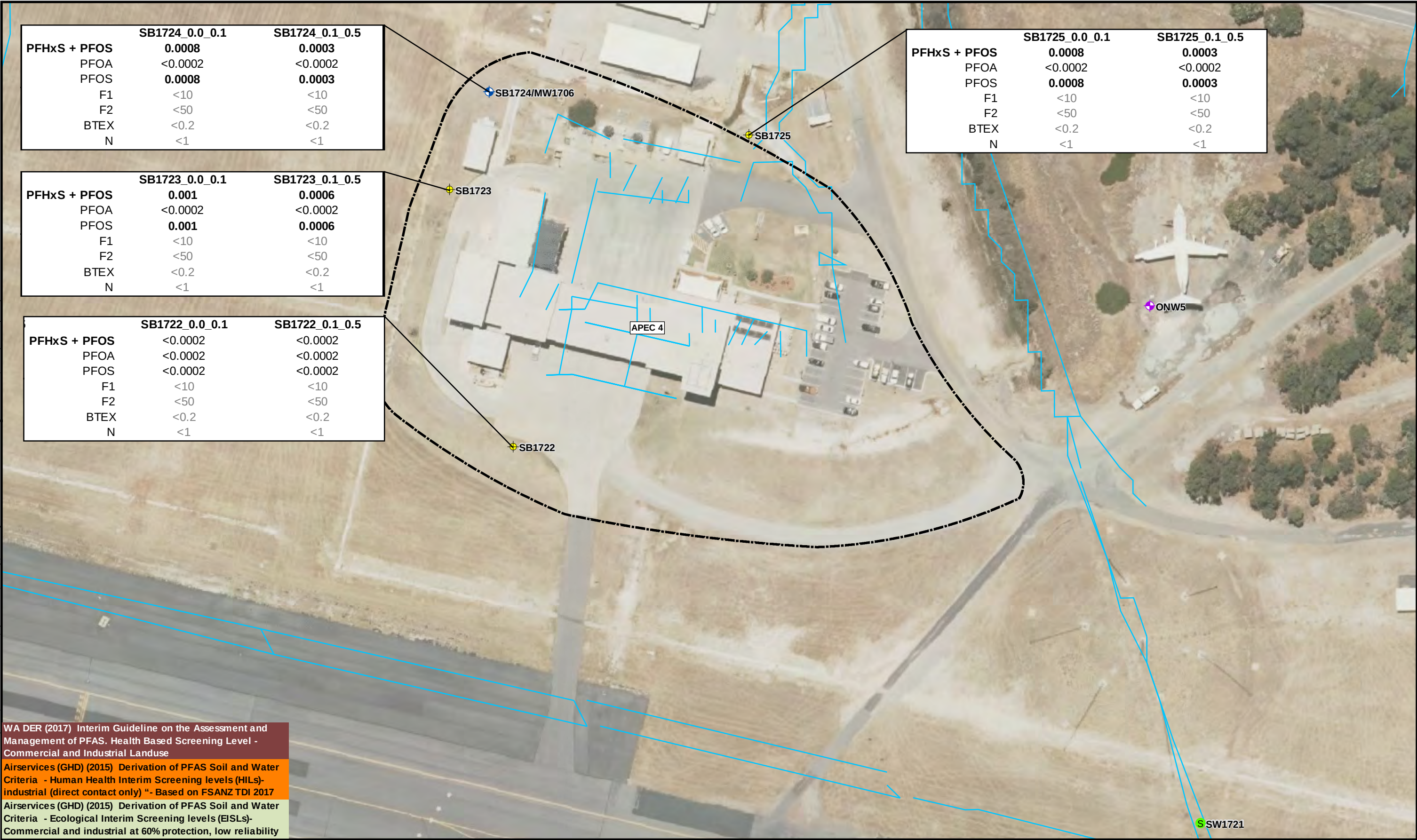
Figure

4a

Map Document: \\AUPER1FP001.au.aecomnet.com\Projects\605X\605091154. Tech Work Area\4.99 GIS\02_MXD\PSI_LIPER_Perth_Airport_Oct2017\IG60543717_Fig 4a_SoilSampling_APEC3b_v1_A3L.mxd

A3 size

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PROJECT ID 60543717

CREATED BY [redacted]

APPROVED BY CRitchie

LAST MODIFIED 09 JUL 2018

1:1,000 (when printed at A3)

DATUM GDA 1994, PROJECTION MGA ZONE 50

0 10 20 30 40 metres

Data sources: Landgate Imagery (Feb, 2017)

Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).

Existing Monitoring Well

Monitoring Well (AECOM, 2017)

Surfacewater Sampling Location (AECOM, 2017)

Soil Bore (AECOM, 2017)

Not Located / Sampled (See Notes)

Areas of Potential Environmental Concern

Perth Airport Estate

Surface Water Drainage Open and Underground

PFOS = Perfluorooctane sulfonic acid
PFOS + PFHxS = Sum of Perfluorooctane sulfonic acid and Perfluorohexane sulfonic acid
PFOA = Perfluorooctanoic acid
F1 = C6-C10 fraction (minus BTEX)(F1)
F2 = >C10-C16 (minus Naphthalene)(F2)
BTEX = Total BTEX
N = Naphthalene
All units are in mg/kg
- not analysed
* = duplicate sample value adopted for conservatism
** = triplicate sample value adopted for conservatism

Notes:
MW0120, MW0135, MW0147 - Not Sampled Data Logger In Bore
MW0120N - Data Logger installed in MW0120, sampled well further north picked up with no Well ID on well
MW0123 (MB12s) - Not Sampled (not accessible due to flooding)
ONW4 - Not Found/Located
SW1719 - Dry

It is noted that the APEC boundaries were broadly identified based on historical land use activities and are not directly correlated with the current Airservices lease areas.

Soil Analytical Results - APEC 4

AIRSERVICES AUSTRALIA

PSI AND LIMITED SAMPLING, PERTH AIRPORT

Figure 4b

WA DER (2017) Interim Guideline on the Assessment and Management of PFAS. Health Based Screening Level - Commercial and Industrial Landuse

Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Human Health Interim Screening levels (HILs)- industrial (direct contact only) "- Based on FSANZ TDI 2017

Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Ecological Interim Screening levels (EISLs)- Commercial and industrial at 60% protection, low reliability

	SB1715_0.0_0.1	SB1715_0.1_0.5
PFHxS + PFOS	0.0272	0.0872
PFOA	0.0261	0.0864
PFOS	<0.0002	<0.0002
F1	<10	<10
F2	<50	<50
BTEX	<0.2	<0.2
N	<1	<1

	SB1717_0.0_0.1	SB1717_0.1_0.5
PFHxS + PFOS	0.0047	0.1801
PFOA	<0.0002	<0.0002
PFOS	0.0042	0.179
F1	<10	<10
F2	<50	<50
BTEX	<0.2	<0.2
N	<1	<1

	SB1716_0.0_0.1	SB1716_0.1_0.5
PFHxS + PFOS	0.0077	0.0084
PFOA	0.0072	0.0084
PFOS	<0.0002	<0.0002
F1	<10	<10
F2	<50	<50
BTEX	<0.2	<0.2
N	<1	<1

	SB1719_0.0_0.1	SB1719_0.1_0.5
PFHxS + PFOS	0.0221	0.006
PFOA	<0.0002	<0.0002
PFOS	0.0214	0.0028
F1	<10	<10
F2	<50	<50
BTEX	<0.2	<0.2
N	<1	<1

	SB1718_0.0_0.1	SB1718_0.1_0.5
PFHxS + PFOS	0.0015	0.0027
PFOA	<0.0002	<0.0002
PFOS	0.001	0.002
F1	<10	<10
F2	<50	<50
BTEX	<0.2	<0.2
N	<1	<1

	SB1720_0.0_0.1	SB1720_0.1_0.5
PFHxS + PFOS	0.0003	0.0007
PFOA	<0.0002	<0.0002
PFOS	0.0003	0.0007
F1	<10	<10
F2	<50	<50
BTEX	<0.2	<0.2
N	<1	<1

LEGEND

-  Existing Monitoring Well
-  Monitoring Well (AECOM, 2017)
-  Surfacewater Sampling Location (AECOM, 2017)
-  Soil Bore (AECOM, 2017)
-  Not Located / Sampled (See Notes)
-  Areas of Potential Environmental Concern
-  Perth Airport Estate

Notes:

MW0120, MW0135, MW0147 - Not Sampled Data Logger In Bore

MW0120N - Data Logger installed in MW0120, sampled well further north picked up with no Well ID on well

MW0123 (MB12s) - Not Sampled (not accessible due to flooding)

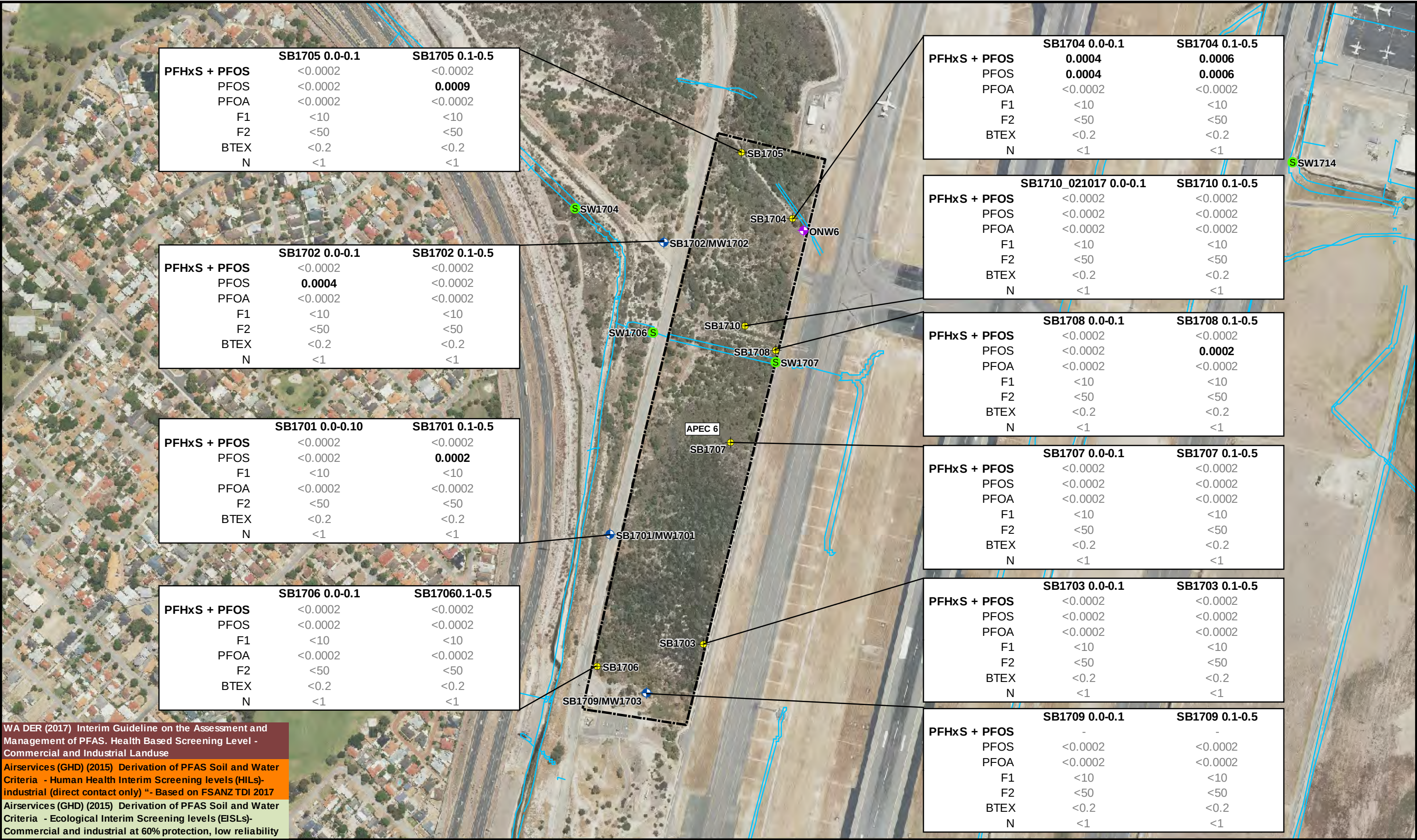
ONW4 - Not Found/Located

SW1719 - Dry

It is noted that the APEC boundaries were broadly identified based on historical land use activities and are not directly correlated with the current Aircservices lease areas.

Soil Analytical Results - APEC 5	
AIRSERVICES AUSTRALIA <i>PSI AND LIMITED SAMPLING, PERTH AIRPORT</i>	Figure 4c

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WA DER (2017) Interim Guideline on the Assessment and Management of PFAS. Health Based Screening Level - Commercial and Industrial Landuse

Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Human Health Interim Screening levels (HILs)-Industrial (direct contact only) "- Based on FSANZ TDI 2017

Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Ecological Interim Screening levels (EISLs)-Commercial and industrial at 60% protection, low reliability

PROJECT ID 60543717

CREATED BY [Redacted]

APPROVED BY CRitchie

LAST MODIFIED 02 MAR 2018

1:5,000 (when printed at A3)

DATUM GDA 1994, PROJECTION MGA ZONE 50

0 50 100 150 200 metres

Data sources: Landgate Imagery (Feb, 2017)

Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).

Existing Monitoring Well

Monitoring Well (AECOM, 2017)

Surfacewater Sampling Location (AECOM, 2017)

Soil Bore (AECOM, 2017)

Not Located / Sampled (See Notes)

Areas of Potential Environmental Concern

Perth Airport Estate

Surface Water Drainage Open and Underground

PFOS = Perfluorooctane sulfonic acid

PFOS + PFHxS = Sum of Perfluorooctane sulfonic acid and Perfluorohexane sulfonic acid

PFOA = Perfluorooctanoic acid

F1 = C6-C10 fraction (minus BTEX)(F1)

F2 = >C10-C16 (minus Naphthalene)(F2)

BTEX = Total BTEX

N = Naphthalene

All units are in mg/kg

- not analysed

* = duplicate sample value adopted for conservatism

** = triplicate sample value adopted for conservatism

Notes:

MW0120, MW0135, MW0147 - Not Sampled Data Logger In Bore

MW0120N - Data Logger installed in MW0120, sampled well further north picked up with no Well ID on well

MW0123 (MB12s) - Not Sampled (not accessible due to flooding)

ONW4 - Not Found/Located

SW1719 - Dry

It is noted that the APEC boundaries were broadly identified based on historical land use activities and are not directly correlated with the current Airservices lease areas.

Soil Analytical Results - APEC 6

AIRSERVICES AUSTRALIA

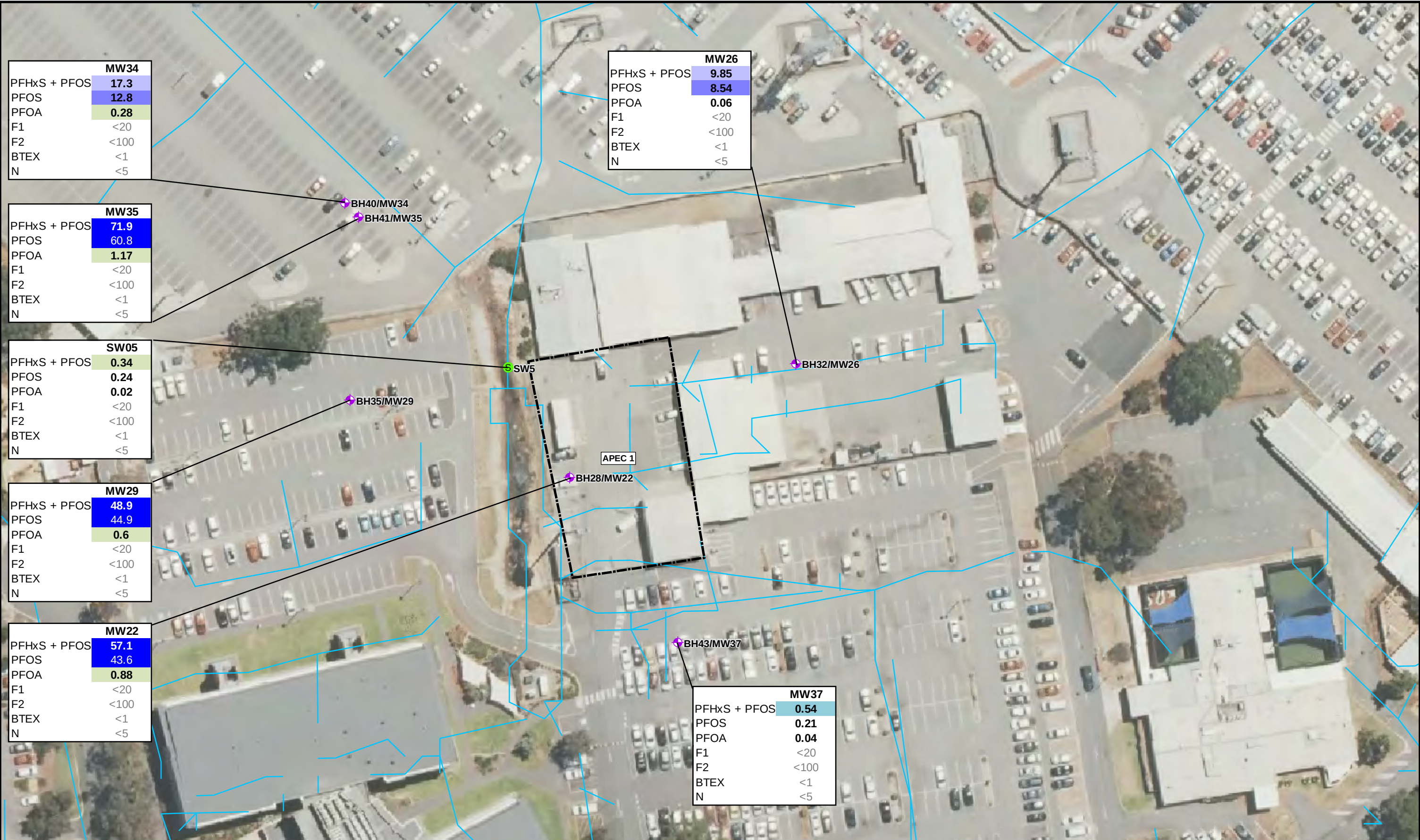
PSI AND LIMITED SAMPLING, PERTH AIRPORT

Figure 4d

Map Document: \\AUPER1\FP001.au.aecomnet.com\Projects\605X\6050911514. Tech Work Area\4.99 GIS\02_MXD\PSI_LIPER_Pertth_Airport_Oct2017\IG60543717_Fig 4d_SoilSampling_APEC6_v1_A3L.mxd

A3 size

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PROJECT ID60543717

CREATED BY

APPROVED BYCRitchie

LAST MODIFIED02 MAR 2018



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1:750

(when printed at A3)

DATUM GDA 1994, PROJECTION MGA ZONE 50

010203040

metres

Data sources: Landgate Imagery (Feb, 2017)

Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).

Existing Monitoring Well

Monitoring Well (AECOM, 2017)

Surfacewater Sampling Location (AECOM, 2017)

Soil Bore (AECOM, 2017)

Not Located / Sampled (See Notes)

Areas of Potential Environmental Concern

Perth Airport Estate

Surface Water Drainage Open and Underground

PFOS = Perfluorooctane sulfonic acid
PFOS + PFHxS = Sum of Perfluorooctane sulfonic acid and Perfluorohexane sulfonic acid
PFOA = Perfluorooctanoic acid
F1 = C6-C10 fraction (minus BTEX)(F1)
F2 = >C10-C16 (minus Naphthalene)(F2)
BTEX = Total BTEX
N = Naphthalene
All units are in µg/L
NA = not analysed
* Duplicate value adopted

It is noted that the APEC boundaries were broadly identified based on historical land use activities and are not directly correlated with the current Airservices lease areas.

DoH (2017) Australian Drinking Water Guideline - Based on FSANZ (2017) Health Based Guidance Values for PFAS

WA DER (2017) Drinking Water

WA DER (2017) Non-potable and recreational

WA DER (2017) Highly disturbed systems - 90% species protection

WA DER (2017) Highly disturbed systems - 80% species protection

Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Ecological Interim Levels (EISLs) (toxicity effects on aquatic organisms)

Notes:

MW0120, MW0135, MW0147 - Not Sampled Data Logger In Bore

MW0120N - Data Logger installed in MW0120, sampled well further north picked up with no Well ID on well

MW0123 (MB12s) - Not Sampled (not accessible due to flooding)

ONW4 - Not Found/Located

SW1719 - Dry

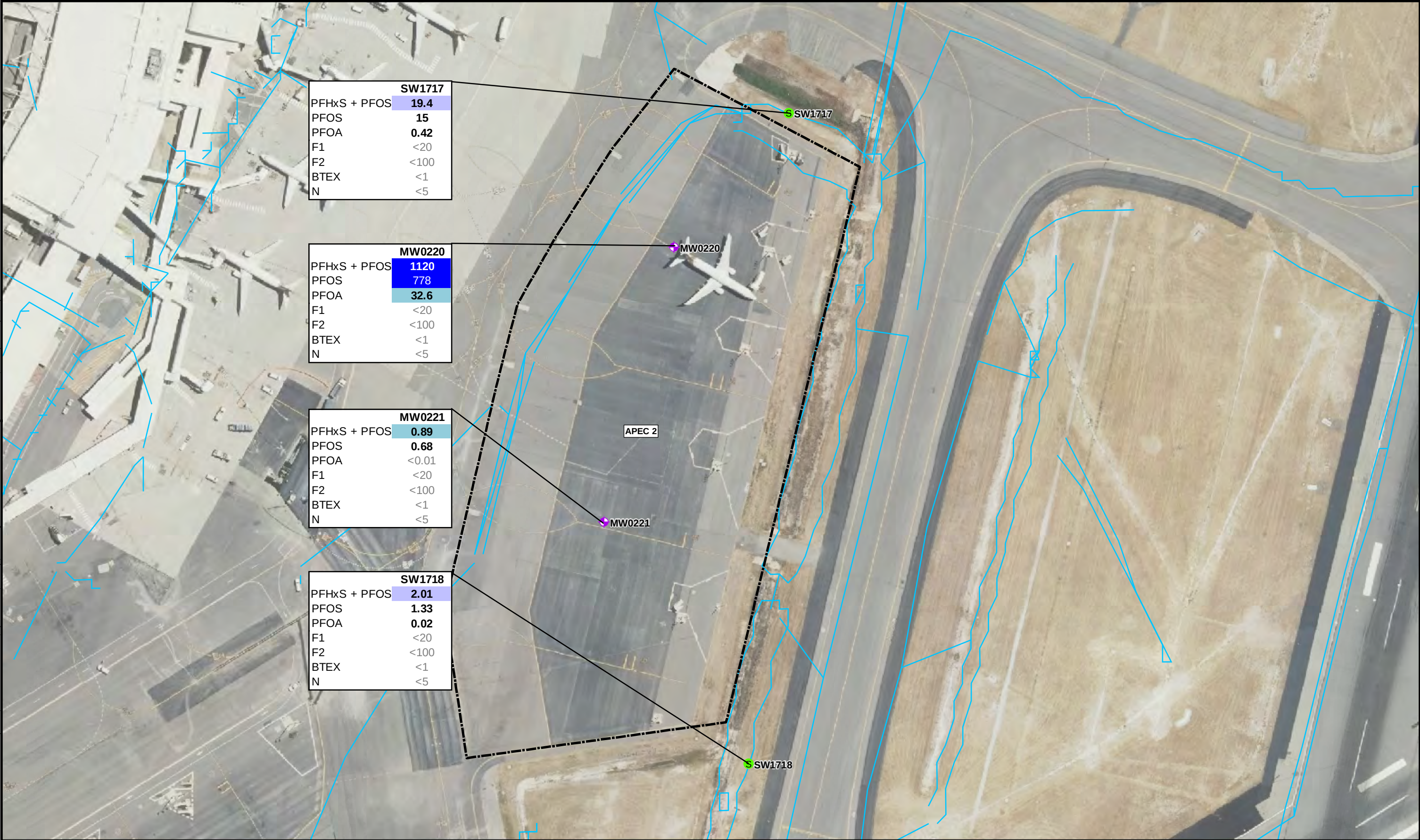
Groundwater and Surface Water Analytical Results - APEC 1

AIRSERVICES AUSTRALIA

PSI AND LIMITED SAMPLING, PERTH AIRPORT

Figure 5a

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PROJECT ID60543717

CREATED BY

APPROVED BYCRitchie

LAST MODIFIED02 MAR 2018

1:1,500 (when printed at A3)

DATUM GDA 1994, PROJECTION MGA ZONE 50

0 10 20 30 40 metres

Data sources: Landgate Imagery (Feb, 2017)

Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).

LEGEND

Existing Monitoring Well

Monitoring Well (AECOM, 2017)

Surfacewater Sampling Location (AECOM, 2017)

Soil Bore (AECOM, 2017)

Not Located / Sampled (See Notes)

Areas of Potential Environmental Concern

Perth Airport Estate

Surface Water Drainage Open and Underground

PFOS = Perfluorooctane sulfonic acid
PFOS + PFHxS = Sum of Perfluorooctane sulfonic acid and Perfluorohexane sulfonic acid
PFOA = Perfluorooctanoic acid
F1 = C6-C10 fraction (minus BTEX)(F1)
F2 = >C10-C16 (minus Naphthalene)(F2)
BTEX = Total BTEX
N = Naphthalene
All units are in µg/L
NA = not analysed
* Duplicate value adopted

It is noted that the APEC boundaries were broadly identified based on historical land use activities and are not directly correlated with the current Airservices lease areas.

DoH (2017) Australian Drinking Water Guideline - Based on FSANZ (2017) Health Based Guidance Values for PFAS

WA DER (2017) Drinking Water

WA DER (2017) Non-potable and recreational

WA DER (2017) Highly disturbed systems - 90% species protection

WA DER (2017) Highly disturbed systems - 80% species protection

Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Ecological Interim Levels (EISLs) (toxicity effects on aquatic organisms)

Notes:

MW0120, MW0135, MW0147 - Not Sampled Data Logger In Bore

MW0120N - Data Logger installed in MW0120, sampled well further north picked up with no Well ID on well

MW0123 (MB12s) - Not Sampled (not accessible due to flooding)

ONW4 - Not Found/Located

SW1719 - Dry

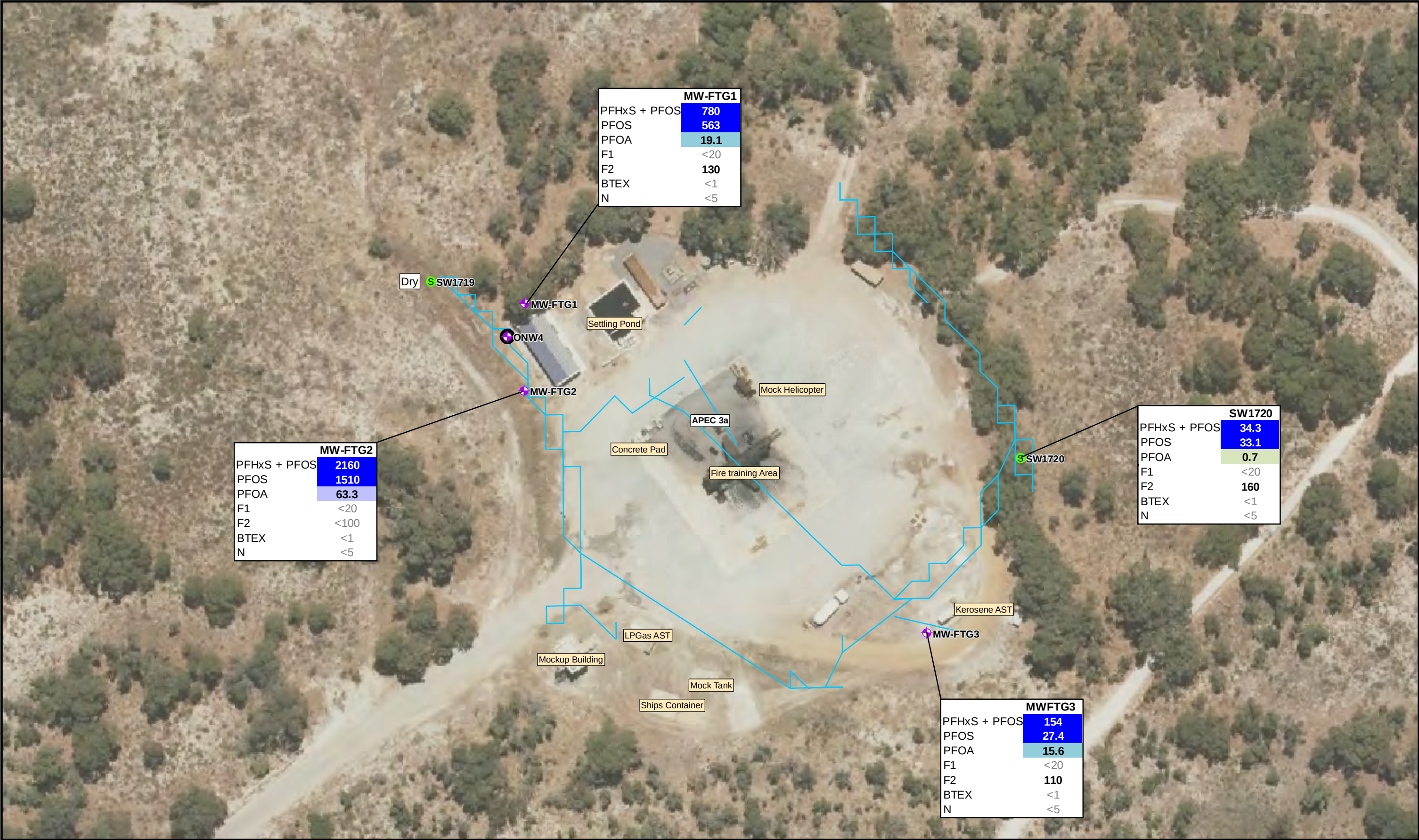
Groundwater and Surface Water Analytical Results - APEC 2

AIRSERVICES AUSTRALIA

PSI AND LIMITED SAMPLING, PERTH AIRPORT

Figure 5b

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PROJECT ID
60543717

CREATED BY
[Redacted]

APPROVED BY
CRitchie

LAST MODIFIED
02 MAR 2018

AECOM

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N

010203040

1:750 (when printed at A3)

DATUM GDA 1994, PROJECTION MGA ZONE 50

metres

Data sources: Landgate Imagery (Feb, 2017)

Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).

- LEGEND**
- Existing Monitoring Well
 - Monitoring Well (AECOM, 2017)
 - Surfacewater Sampling Location (AECOM, 2017)
 - Soil Bore (AECOM, 2017)
 - Not Located / Sampled (See Notes)
 - Areas of Potential Environmental Concern
 - Perth Airport Estate
 - Surface Water Drainage Open and Underground

PFOS = Perfluorooctane sulfonic acid
PFOS + PFHxS = Sum of Perfluorooctane sulfonic acid and Perfluorohexane sulfonic acid
PFOA = Perfluorooctanoic acid
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BTEX = Total BTEX
N = Naphthalene
All units are in µg/L
NA = not analysed
* Duplicate value adopted

It is noted that the APEC boundaries were broadly identified based on historical land use activities and are not directly correlated with the current Airservices lease areas.

DoH (2017) Australian Drinking Water Guideline - Based on FSANZ (2017) Health Based Guidance Values for PFAS
WA DER (2017) Drinking Water
WA DER (2017) Non-potable and recreational
WA DER (2017) Highly disturbed systems - 90% species protection
WA DER (2017) Highly disturbed systems - 80% species protection
Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Ecological Interim Levels (EISLs) (toxicity effects on aquatic organisms)

Notes:
MW0120, MW0135, MW0147 - Not Sampled Data Logger In Bore
MW0120N - Data Logger installed in MW0120, sampled well further north picked up with no Well ID on well
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ONW4 - Not Found/Located
SW1719 - Dry

Groundwater and Surface Water Analytical Results - APEC 3a

AIRSERVICES AUSTRALIA

PSI AND LIMITED SAMPLING, PERTH AIRPORT

Figure

5c

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PROJECT ID60543717

CREATED BY

APPROVED BYBEIsmen

LAST MODIFIED09 FEB 2018



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010203040

metres

1:750 (when printed at A3)

DATUM GDA 1994, PROJECTION MGA ZONE 50

Data sources: Landgate Imagery (Feb, 2017)

Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).

LEGEND

 Existing Monitoring Well

 Monitoring Well (AECOM, 2017)

 Surfacewater Sampling Location (AECOM, 2017)

 Soil Bore (AECOM, 2017)

 Wells Not Located / Sampled

 Areas of Potential Environmental Concern

 Perth Airport Estate

 Surface Water Drainage Open and Underground

PFOS = Perfluorooctane sulfonic acid
PFOS + PFHxS = Sum of Perfluorooctane sulfonic acid and Perfluorohexane sulfonic acid
PFOA = Perfluorooctanoic acid
F1 = C6-C10 fraction (minus BTEX)(F1)
F2 = >C10-C16 (minus Naphthalene)(F2)
BTEX = Total BTEX
N = Naphthalene
All units are in µg/L
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* Duplicate value adopted

It is noted that the APEC boundaries were broadly identified based on historical land use activities and are not directly correlated with the current Airservices lease areas.

DoH (2017) Australian Drinking Water Guideline - Based on FSANZ (2017) Health Based Guidance Values for PFAS

WA DER (2017) Drinking Water

WA DER (2017) Non-potable and recreational

WA DER (2017) Highly disturbed systems - 90% species protection

WA DER (2017) Highly disturbed systems - 80% species protection

Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Ecological Interim Levels (EISLs) (toxicity effects on aquatic organisms)

Notes:

MW0120, MW0135, MW0147 - Not Sampled Data Logger In Bore

MW0120N - Data Logger installed in MW0120, sampled well further north picked up with no Well ID on well

MW0123 (MB12s) - Not Sampled (not accessible due to flooding)

ONW4 - Not Found/Located

SW1719 - Dry

Groundwater Sampling Analytical Results - APEC 3b

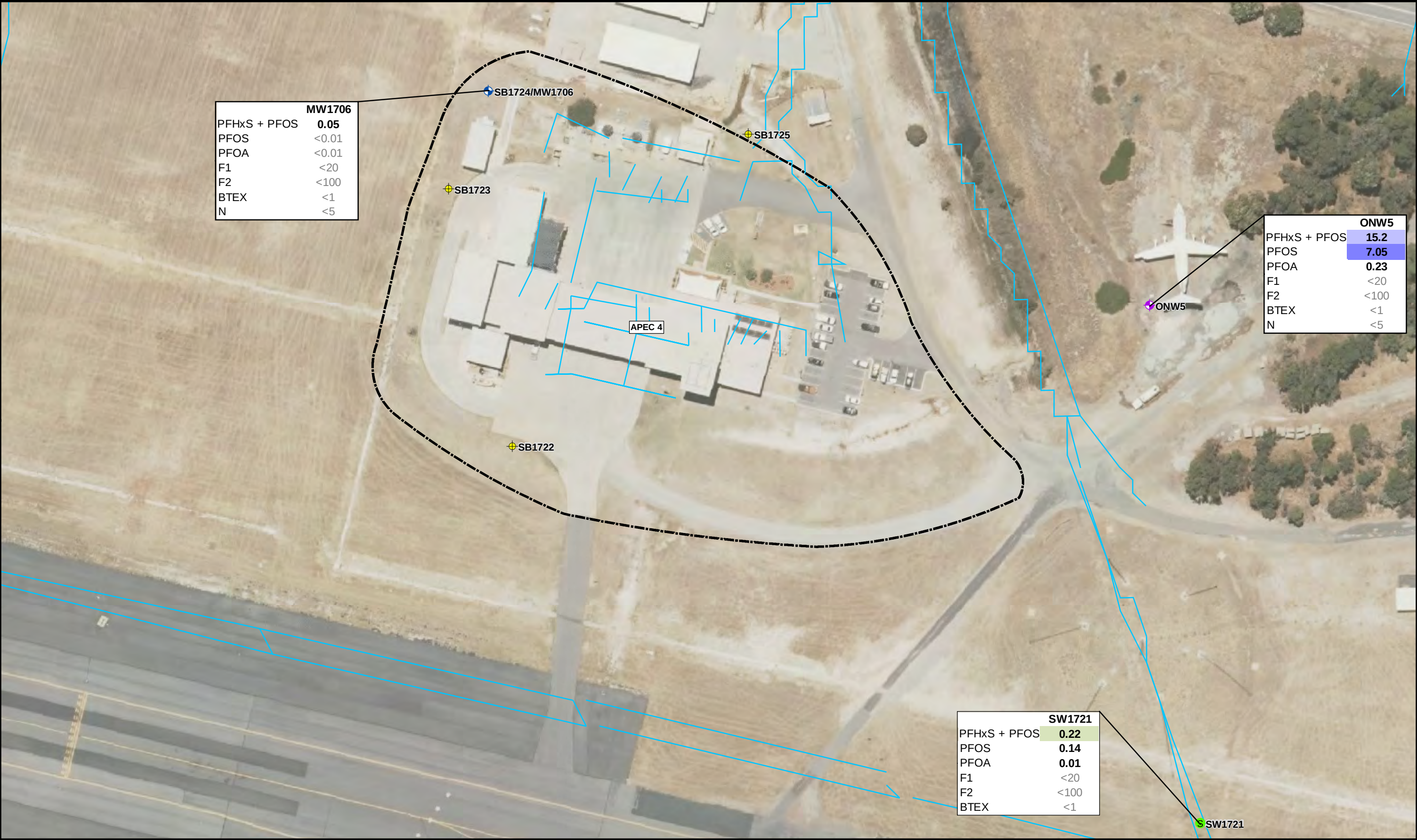
AIRSERVICES AUSTRALIA

PSI AND LIMITED SAMPLING, PERTH AIRPORT

Figure

5d

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PROJECT ID
60543717

CREATED BY
[Redacted]

APPROVED BY
CRitchie

LAST MODIFIED
02 MAR 2018

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1:1,000
(when printed at A3)

DATUM GDA 1994, PROJECTION MGA ZONE 50

0 10 20 30 40
metres

Data sources: Landgate Imagery (Feb, 2017)
Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).

LEGEND

- Existing Monitoring Well
- Monitoring Well (AECOM, 2017)
- Surfacewater Sampling Location (AECOM, 2017)
- Soil Bore (AECOM, 2017)
- Not Located / Sampled (See Notes)
- Areas of Potential Environmental Concern
- Perth Airport Estate
- Surface Water Drainage Open and Underground

PFOS = Perfluorooctane sulfonic acid
PFOS + PFHxS = Sum of Perfluorooctane sulfonic acid and Perfluorohexane sulfonic acid
PFOA = Perfluorooctanoic acid
F1 = C6-C10 fraction (minus BTEX)(F1)
F2 = >C10-C16 (minus Naphthalene)(F2)
BTEX = Total BTEX
N = Naphthalene
All units are in µg/L
NA = not analysed
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It is noted that the APEC boundaries were broadly identified based on historical land use activities and are not directly correlated with the current Airservices lease areas.

DoH (2017) Australian Drinking Water Guideline - Based on FSANZ (2017) Health Based Guidance Values for PFAS

WA DER (2017) Drinking Water

WA DER (2017) Non-potable and recreational

WA DER (2017) Highly disturbed systems - 90% species protection

WA DER (2017) Highly disturbed systems - 80% species protection

Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Ecological Interim Levels (EISLs) (toxicity effects on aquatic organisms)

Notes:

MW0120, MW0135, MW0147 - Not Sampled Data Logger In Bore

MW0120N - Data Logger installed in MW0120, sampled well further north picked up with no Well ID on well

MW0123 (MB12s) - Not Sampled (not accessible due to flooding)

ONW4 - Not Found/Located

SW1719 - Dry

Groundwater and Surface Water Analytical Results - APEC 4

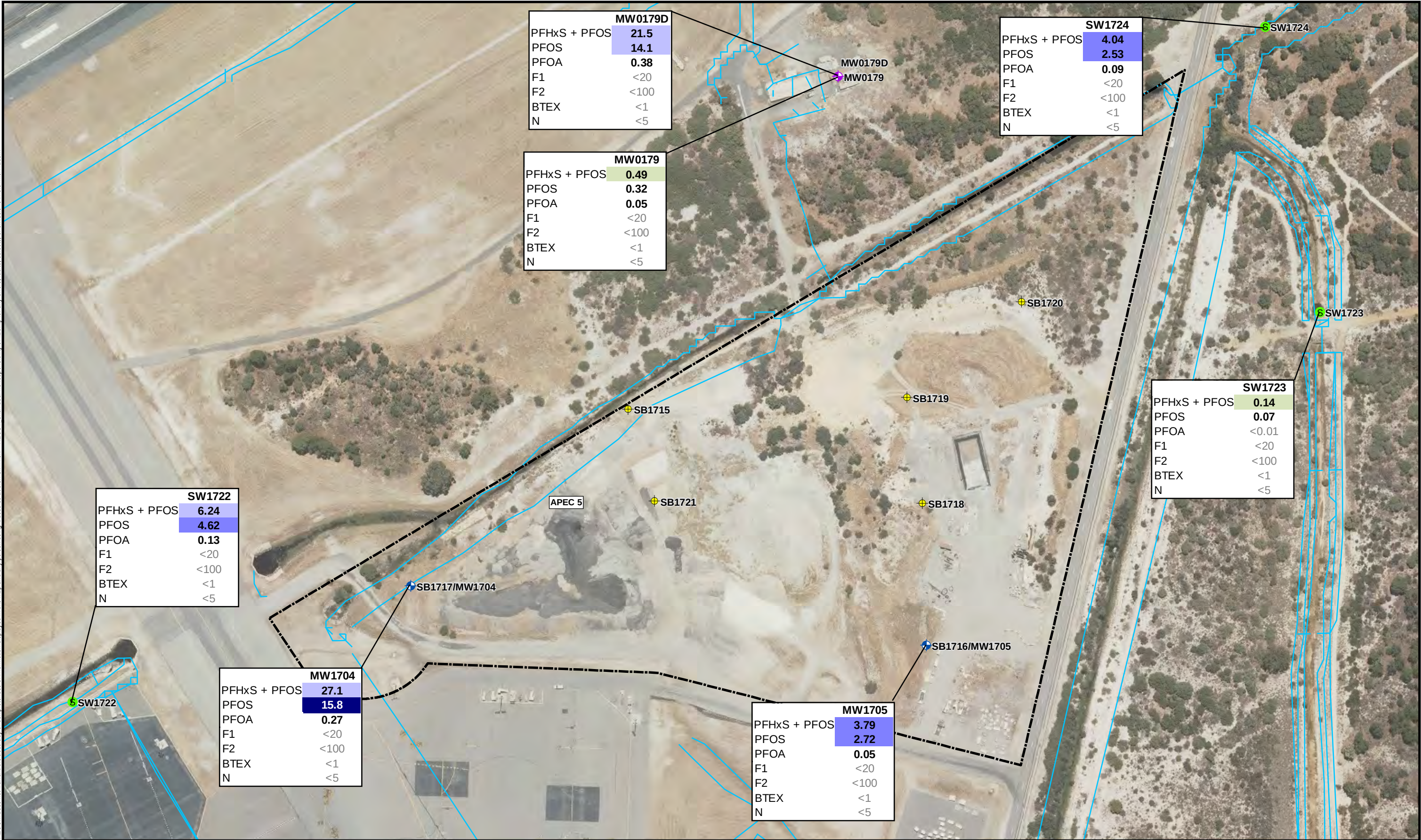
AIRSERVICES AUSTRALIA

PSI AND LIMITED SAMPLING, PERTH AIRPORT

Figure

5e

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PROJECT ID60543717

CREATED BY

APPROVED BYCRitchie

LAST MODIFIED02 MAR 2018

AECOM

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1:2,000

(when printed at A3)

DATUM GDA 1994, PROJECTION MGA ZONE 50

Information Authority trading as Landgate (2010).

020406080

metres

- LEGEND**
- Existing Monitoring Well
 - Monitoring Well (AECOM, 2017)
 - Surfacewater Sampling Location (AECOM, 2017)
 - Soil Bore (AECOM, 2017)
 - Not Located / Sampled (See Notes)
 - Areas of Potential Environmental Concern
 - Perth Airport Estate
 - Surface Water Drainage Open and Underground

PFOS = Perfluorooctane sulfonic acid
PFOS + PFHxS = Sum of Perfluorooctane sulfonic acid and Perfluorohexane sulfonic acid
PFOA = Perfluorooctanoic acid
F1 = C6-C10 fraction (minus BTEX)(F1)
F2 = >C10-C16 (minus Naphthalene)(F2)
BTEX = Total BTEX
N = Naphthalene
All units are in µg/L
NA = not analysed
* Duplicate value adopted

It is noted that the APEC boundaries were broadly identified based on historical land use activities and are not directly correlated with the current Airservices lease areas.

DoH (2017) Australian Drinking Water Guideline - Based on FSANZ (2017) Health Based Guidance Values for PFAS
WA DER (2017) Drinking Water
WA DER (2017) Non-potable and recreational
WA DER (2017) Highly disturbed systems - 90% species protection
WA DER (2017) Highly disturbed systems - 80% species protection
Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Ecological Interim Levels (EISLs) (toxicity effects on aquatic organisms)

Notes:
MW0120, MW0135, MW0147 - Not Sampled Data Logger In Bore
MW0120N - Data Logger installed in MW0120, sampled well further north picked up with no Well ID on well
MW0123 (MB12s) - Not Sampled (not accessible due to flooding)
ONW4 - Not Found/Located
SW1719 - Dry

Groundwater and Surface Water Analytical Results - APEC 5

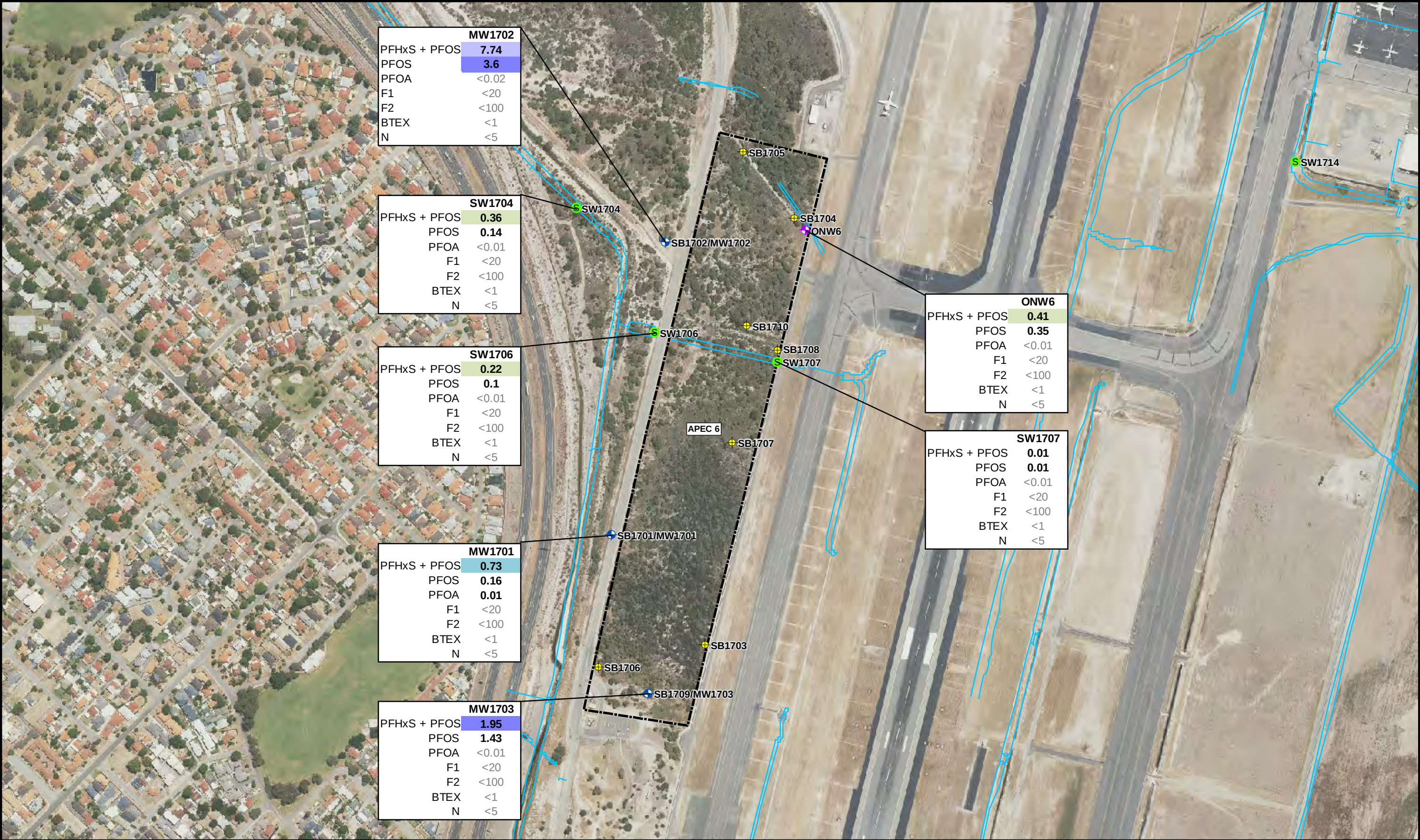
AIRSERVICES AUSTRALIA

PSI AND LIMITED SAMPLING, PERTH AIRPORT

Figure

5f

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PROJECT ID 60543717
CREATED BY
APPROVED BY CRitchie
LAST MODIFIED 02 MAR 2018

www.aecom.com

1:5,000 (when printed at A3)
DATUM GDA 1994, PROJECTION MGA ZONE 50

0 50 100 150 200 metres

Data sources: Landgate Imagery (Feb, 2017)
Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).

Groundwater and Surface Water Analytical Results - APEC 6

AIRSERVICES AUSTRALIA

PSI AND LIMITED SAMPLING, PERTH AIRPORT

Figure 5g

Tables

								APEC 3B							
Location								SB1711		SB1712		SB1713		SB1714	
Field ID								SB1711_031017_0-0.1	SB1711_031017_0.1-0.5	SB1712_031017_0.0-0.1	SB1712_031017_0.1-0.5	SB1713_031017_0.0-0.1	SB1713_031017_0.1-0.5	SB1714_031017_0-0.1	SB1714_031017_0.1-0.5
Sample Depth								0-0.1	0.1-0.5	0.1-0.5	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0.1-0.5
Sample Date								03-Oct-17	03-Oct-17	03-Oct-17	03-Oct-17	03-Oct-17	03-Oct-17	03-Oct-17	03-Oct-17
Sample Type								Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Lab Report No.								EP1710913	EP1710913	EP1710913	EP1710913	EP1710913	EP1710913	EP1710913	EP1710913
				ASA (GHD) 2015. EISLs - Comm / Ind 60% species protection level	ASA (GHD) 2015. HISLs- Industrial (direct Contact)	ASA (GHD) 2017. HBSC Comm / Ind (after FSANZ TDI)	WA DER - 2017. Health Based Screening Levels Comm / Ind								
Per- & Polyfluoroalkyl Subst.	Sum of PFAS	mg/kg	0.0002					0.0217	0.0338	0.402	0.175	0.0217	0.0558	0.0902	0.0578
	Sum of PFAS (WA DER List)	mg/kg	0.0002					0.0217	0.0338	0.395	0.165	0.0169	0.0551	0.0878	0.056
	10:2 FTS	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.0005	0.001	<0.0005	<0.0005	<0.0005
	8:2 FTS	mg/kg	0.0005	3.73	240			<0.0005	<0.0005	<0.0005	<0.0005	0.0007	<0.0005	<0.0005	<0.0005
	6:2 FTS	mg/kg	0.0005	NA	900			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	4:2 FTS	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	MeFOSAA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	N-Me-FOSA	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	N-Me-FOSE	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	PFPeS	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0008	0.0004
	PFHpS	mg/kg	0.0002					<0.0002	<0.0002	0.0005	0.0002	<0.0002	<0.0002	0.0007	0.0004
	EtFOSAA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFPeA	mg/kg	0.0002					<0.0002	0.0003	0.0005	<0.0002	<0.0002	<0.0002	0.0009	0.0009
	FOSA	mg/kg	0.0002					<0.0002	<0.0002	0.0039	0.0064	0.0009	0.0003	0.0009	0.001
	PFBS	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0011	0.0005
	PFDS	mg/kg	0.0002					<0.0002	<0.0002	0.0015	0.0017	0.0002	<0.0002	<0.0002	<0.0002
	PFTeDA	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	PFTrDA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	N-Et-FOSA	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	PFDoA	mg/kg	0.0002					<0.0002	<0.0002	0.0005	0.0009	0.0017	0.0004	<0.0002	<0.0002
	PFHpA	mg/kg	0.0002					<0.0002	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	0.0002	<0.0002
	PFHxA	mg/kg	0.0002					0.0003	0.0003	0.0007	0.0004	<0.0002	<0.0002	0.0022	0.0015
	N-Et-FOSE	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	PFDoA	mg/kg	0.0002					<0.0002	<0.0002	0.0004	0.0005	0.0003	<0.0002	<0.0002	<0.0002
	PFNA	mg/kg	0.0002					<0.0002	<0.0002	0.0004	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFUnA	mg/kg	0.0002					<0.0002	<0.0002	0.0003	0.0007	0.0007	<0.0002	<0.0002	<0.0002
	PFOA	mg/kg	0.0002	3.73	240	680		0.0002	<0.0002	0.0009	0.0004	0.0004	<0.0002	0.0015	0.0011
	PFOS	mg/kg	0.0002	4.71	90			0.0197	0.0325	0.391	0.163	0.0148	0.0546	0.0734	0.0466
	PFHxS	mg/kg	0.0002				100	0.0015	0.0007	0.0012	0.001	0.001	0.0005	0.0085	0.0054
	Sum (PFHxS + PFOS)	mg/kg	0.0002					0.0212	0.0332	0.3922	0.164	0.0158	0.0551	0.0819	0.052

Data Comments
#1 Quantification of linear and branched isomers has been conducted as a single total response using the relative
Legend

WA DER (2017) Interim Guideline on the Assessment and Management of PFAS. Health Based Screening Level - Commercial and Industrial Landuse
Airservices (GHD) (2017) Derivation of PFAS Soil and Water Criteria - Health Based Screening Criteria (HBSC) - Commercial / Industrial Landuse - Based on FSANZ TDI 2017
Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Human Health Interim Screening levels (HISLs)- Industrial (direct contact only)
Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Ecological Interim Screening levels (EISLs)- Commercial and industrial at 60% protection, low reliability
LOR = Limit of Reporting
- = not analysed
mg/kg = milligrams per kilogram

				APEC 4															
				Location	SB17071		SB1722		SB1723		SB1724				SB1725		SB1715		
				Field ID	B17071_031017_0-0-0	SB17071_031017_0.1-0.5	SB1722_0-0_0.1	SB1722_0.1_0.5	SB1723_0-0_0.1	SB1723_0.1_0.5	SB1724_0-0_0.1	SB1724_0.1_0.5	SQA06_120917	SQA05_120917	SB1725_0-0_0.1	SB1725_0.1_0.5	SB1715_0-0_0.1	SB1715_0.1_0.5	
				Sample Depth	0-0-0.1	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0.1-0.5	0.1-0.5	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0.1-0.5	
				Sample Date	03-Oct-17	03-Oct-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	
				Sample Type	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Duplicate	Triplicate	Primary	Primary	Primary	Primary
				Lab Report No.	EP1710913	EP1710913	EP1710035	EP1710035	EP1710035	EP1710035	EP1710035	EP1710035	EP1710035	562900	EP1710035	EP1710035	EP1710035	EP1710035	
				ASA (GHD) 2015. EISLs - Comm / Ind 60% species protection level	ASA (GHD) 2015. HISLs- Industiral (direct Contact)	ASA (GHD) 2017. HBSC Comm / Ind (after FSANZ TDJ)	WA DER - 2017. Health Based Screening Levels Comm / Ind												
COPC	Unit	LOR	Sum of PFAS	mg/kg	0.0002	0.084	0.727	<0.0002	<0.0002	0.001	0.0006	0.0008	0.0003	0.0006	<0.05	0.0008	0.0003	0.0286	0.0872
Sum of PFAS (WA DER List)	mg/kg	0.0002	0.0793	0.718	<0.0002	<0.0002	0.001	0.0006	0.0008	0.0003	0.0006	<0.01	0.0008	0.0003	0.0272	0.0872			
10:2 FTS	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
8:2 FTS	mg/kg	0.0005	3.73	240	0.0015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
6:2 FTS	mg/kg	0.0005	NA	900	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
4:2 FTS	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
MeFOSAA	mg/kg	0.0002	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.01	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
N-Me-FOSA	mg/kg	0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
N-Me-FOSE	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
PFPeS	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
PFHpS	mg/kg	0.0002	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
EiFOSAA	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.01	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
PFPeA	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
FOSA	mg/kg	0.0002	0.0007	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
PFBS	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
PFDS	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	0.0014	<0.0002			
PFTeDA	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
PFTrDA	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
N-Et-FOSA	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
PFDCa	mg/kg	0.0002	0.0019	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
PFHpA	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
PFHxA	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
N-Et-FOSE	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
PFDoA	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
PFNA	mg/kg	0.0002	0.0021	0.0084	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
PFUnA	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
PFOA	mg/kg	0.0002	3.73	240	680	0.0003	0.0017	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
PFOS	mg/kg	0.0002	4.71	90	0.077	0.716	<0.0002	<0.0002	0.001	0.0006	0.0008	0.0003	0.0006	<0.005	0.0008	0.0003	0.0261	0.0864	
PFHxS	mg/kg	0.0002	0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	0.0011	0.0008	
Sum (PFHxS + PFOS)	mg/kg	0.0002	0.0775	0.716	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<5	0.0008	0.0003	0.0272	0.0872	

Data Comments
#1 Quantification of linear and branched isomers has been conducted as a single total response using the relative Legend

WA DER (2017) Interim Guideline on the Assessment and Management of PFAS. Health Based Screening Level - Commercial and Industrial Landuse
Airservices (GHD) (2017) Derivation of PFAS Soil and Water Criteria - Health Based Screening Criteria (HBSC) - Commercial / Industrial Landuse - Based on FSANZ TDI 2017
Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Human Health Interim Screening levels (HISLs)- Industrial (direct contact only)
Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Ecological Interim Screening levels (EISLs)- Commercial and industrial at 60% protection, low reliability
LOR = Limit of Reporting
- = not analysed
mg/kg = milligrams per kilogram

				APEC 5																	
				Location	SB1716				SB1717		SB1718		SB1719		SB1720		SB1721				
				Field ID	SB1716_0.0_0.1	SB1716_0.1_0.5	SQA01_120917	SQA02_120917	SB1717_0.0_0.1	SB1717_0.1_0.5	SB1718_0.0_0.1	SB1718_0.1_0.5	SB1719_0.0_0.1	SB1719_0.1_0.5	SB1720_0.0_0.1	SB1720_0.1_0.5	SB1721_0.0_0.1	SB1721_0.1_0.5			
				Sample Depth	0-0.1	0.1-0.5	0.1-0.5	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0.1-0.5			
				Sample Date	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17			
				Sample Type	Primary	Primary	Duplicate	Triplicate	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary			
				Lab Report No.	EP1710035	EP1710035	EP1710035	562900	EP1710035	EP1710035	EP1710035	EP1710035	EP1710035	EP1710035	EP1710035	EP1710035	EP1710035				
				ASA (GHD) 2015. EISLs - Comm / Ind 60% species protection level	ASA (GHD) 2015. HISLs- Industrial (direct Contact)	ASA (GHD) 2017. HBSC Comm / Ind (after FSANZ TDI)	WA DER - 2017. Health Based Screening Levels Comm / Ind														
Per- & Polyfluoroalkyl Subst.	COPC	Unit	LOR					0.0077	0.0084	0.0066	<0.05	0.0067	0.182	0.0015	0.0027	0.0223	0.0062	0.0003	0.0007	<0.0002	0.0002
	Sum of PFAS	mg/kg	0.0002					0.0077	0.0084	0.0066	0.015	0.0047	0.181	0.0015	0.0027	0.0221	0.006	0.0003	0.0007	<0.0002	0.0002
	Sum of PFAS (WA DER List)	mg/kg	0.0002					0.0077	0.0084	0.0066	0.015	0.0047	0.181	0.0015	0.0027	0.0221	0.006	0.0003	0.0007	<0.0002	0.0002
	10:2 FTS	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	8:2 FTS	mg/kg	0.0005	3.73	240			<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	6:2 FTS	mg/kg	0.0005	NA	900			<0.0005	<0.0005	<0.0005	<0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	4:2 FTS	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	MeFOSAA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.01	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	N-Me-FOSA	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	N-Me-FOSE	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	PFPeS	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFHpS	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	EtFOSAA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.01	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFPeA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.005	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	FOSA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.005	0.0002	0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFBS	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFDS	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.005	0.0018	<0.0002	<0.0002	<0.0002	0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFTeDA	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	PFTrDA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	N-Et-FOSA	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	PFDoA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFHpA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFHxA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.005	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	N-Et-FOSE	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	PFDoA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFNA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFUnA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFOA	mg/kg	0.0002	3.73	240	680		<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFOS	mg/kg	0.0002	4.71	90			0.0072	0.0084	0.0066	0.015	0.0042	0.179	0.001	0.002	0.0214	0.0028	0.0003	0.0007	<0.0002	0.0002	
PFHxS	mg/kg	0.0002				100	0.0005	<0.0002	<0.0002	<0.005	0.0005	0.0011	0.0005	0.0007	0.0007	0.0032	<0.0002	<0.0002	<0.0002	<0.0002	
Sum (PFHxS + PFOS)	mg/kg	0.0002					0.0077	0.0084	0.0066	0.015	0.0047	0.1801	0.0015	0.0027	0.0221	0.006	0.0003	0.0007	<0.0002	0.0002	

Data Comments
#1 Quantification of linear and branched isomers has been conducted as a single total response using the relative
Legend
WA DER (2017) Interim Guideline on the Assessment and Management of PFAS. Health Based Screening Level - Commercial and Industrial Landuse
Airservices (GHD) (2017) Derivation of PFAS Soil and Water Criteria - Health Based Screening Criteria (HBSC) - Commercial / Industrial Landuse - Based on FSANZ TDI 2017
Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Human Health Interim Screening levels (HILs)- Industrial (direct contact only)
Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Ecological Interim Screening levels (EISLs)- Commercial and industrial at 60% protection, low reliability
LOR = Limit of Reporting
- = not analysed
mg/kg = milligrams per kilogram

				APEC 6															
				Location	SB1701				SB1702				SB1703		SB1704				
				Field ID	SB1701_021017 0.0-0.10	SQA11_021017	SQA12_021017	SB1701_021017 0.1-0.5	SB1702_021017 0.0-0.1	SB1702_021017 0.1-0.5	SQA14_031017	SQA15_031017	SB1703_021017 0.0-0.1	SB1703_021017 0.1-0.5	SB1704_021017 0.0-0.1	SB1704_021017 0.1-0.5			
				Sample Depth	0-0.1	0-0.1	0-0.1	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0-0.1	0-0.1	0.1-0.5	0-0.1	0.1-0.5			
				Sample Date	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	03-Oct-17	03-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17			
				Sample Type	Primary	Duplicate	Triplicate	Primary	Primary	Primary	Triplicate	Duplicate	Primary	Primary	Primary	Primary			
Lab Report No.	EP1710915	EP1710915	565739	EP1710915	EP1710915	EP1710915	565919	EP1710913	EP1710915	EP1710915	EP1710915	EP1710915							
				ASA (GHD) 2015. EISLs - Comm / Ind 60% species protection level	ASA (GHD) 2015. HISLs- Industrial (direct Contact)	ASA (GHD) 2017. HBSC Comm / Ind (after FSANZ TDI)	WA DER - 2017. Health Based Screening Levels Comm / Ind												
COPC	Unit	LOR						<0.0002	<0.0002	<0.05	0.0002	0.0004	<0.0002	0.161	0.146	<0.0002	<0.0002	0.0004	0.0008
Sum of PFAS	mg/kg	0.0002						<0.0002	<0.0002	<0.01	0.0002	0.0004	<0.0002	0.13	0.132	<0.0002	<0.0002	0.0004	0.0008
Sum of PFAS (WA DER List)	mg/kg	0.0002						<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 FTS	mg/kg	0.0005						<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 FTS	mg/kg	0.0005		3.73	240			<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 FTS	mg/kg	0.0005		NA	900			<0.0005	<0.0005	<0.01	<0.0005	<0.0005	<0.0005	<0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
4:2 FTS	mg/kg	0.0005						<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
MeFOSAA	mg/kg	0.0002						<0.0002	<0.0002	<0.01	<0.0002	<0.0002	<0.0002	<0.01	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Me-FOSA	mg/kg	0.0005						<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Me-FOSE	mg/kg	0.0005						<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
PFPeS	mg/kg	0.0002						<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFHpS	mg/kg	0.0002						<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.005	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EtFOSAA	mg/kg	0.0002						<0.0002	<0.0002	<0.01	<0.0002	<0.0002	<0.0002	<0.01	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFPeA	mg/kg	0.0002						<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.005	0.0005	<0.0002	<0.0002	<0.0002	<0.0002
FOSA	mg/kg	0.0002						<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	0.013	0.0085	<0.0002	<0.0002	<0.0002	<0.0002
PFBS	mg/kg	0.0002						<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFDS	mg/kg	0.0002						<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	0.018	0.0031	<0.0002	<0.0002	<0.0002	<0.0002
PFTeDA	mg/kg	0.0005						<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
PFTrDA	mg/kg	0.0002						<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Et-FOSA	mg/kg	0.0005						<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
PFDCa	mg/kg	0.0002						<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.005	0.0008	<0.0002	<0.0002	<0.0002	<0.0002
PFHpA	mg/kg	0.0002						<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.005	0.0003	<0.0002	<0.0002	<0.0002	<0.0002
PFHxA	mg/kg	0.0002						<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.005	0.0008	<0.0002	<0.0002	<0.0002	<0.0002
N-Et-FOSE	mg/kg	0.0005						<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
PFDoA	mg/kg	0.0002						<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.005	0.0009	<0.0002	<0.0002	<0.0002	<0.0002
PFNA	mg/kg	0.0002						<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFUnA	mg/kg	0.0002						<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.005	0.0008	<0.0002	<0.0002	<0.0002	<0.0002
PFOA	mg/kg	0.0002		3.73	240	680		<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.005	0.0007	<0.0002	<0.0002	<0.0002	<0.0002
PFOS	mg/kg	0.0002		4.71	90			<0.0002	<0.0002	<0.005	0.0002	0.0004	<0.0002	0.13	0.128	<0.0002	<0.0002	0.0004	0.0006
PFHxS	mg/kg	0.0002					100	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.005	0.0012	<0.0002	<0.0002	<0.0002	0.0002
Sum (PFHxS + PFOS)	mg/kg	0.0002						<0.002	<0.0002	<0.005	0.0002	0.0004	<0.0002	0.13	0.1292	<0.0002	<0.0002	0.0004	0.0006

Data Comments
#1 Quantification of linear and branched isomers has been conducted as a single total response using the relative Legend

WA DER (2017) Interim Guideline on the Assessment and Management of PFAS. Health Based Screening Level - Commercial and Industrial Landuse
Airservices (GHD) (2017) Derivation of PFAS Soil and Water Criteria - Health Based Screening Criteria (HBSC) - Commercial / Industrial Landuse - Based on FSANZ TDI 2017
Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Human Health Interim Screening levels (HILs)- Industrial (direct contact only)
Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Ecological Interim Screening levels (EISLs)- Commercial and industrial at 60% protection, low reliability

LOR = Limit of Reporting
- = not analysed
mg/kg = milligrams per kilogram

				APEC 6															
				Location	SB1705		SB1706		SB1707				SB1708		SB1709		SB1710		
				Field ID	SB1705_021017 0.0-0.1	SB1705_021017 0.1-0.5	SB1706_021017 0.0-0.1	SB1706_021017 0.1-0.5	SB1707_021017 0.0-0.1	SB1707_021017 0.1-0.5	SQA13_021017	SQA14_021017	SB1708_021017 0.0-0.1	SB1708_021017 0.1-0.5	SB1709_021017 0.0-0.1	SB1709_021017 0.1-0.5	SB1710_021017 0.0-0.1	SB1710_021017 0.1-0.5	
				Sample Depth	0-0.1	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0-0.1	0-0.1	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0.1-0.5	
				Sample Date	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	
				Sample Type	Primary	Primary	Primary	Primary	Primary	Primary	Triplicate	Duplicate	Primary	Primary	Primary	Primary	Primary	Primary	
				Lab Report No.	EP1710915	EP1710915	EP1710915	EP1710915	EP1710915	EP1710915	565739	EP1710915	EP1710915	EP1710915	EP1710915	EP1710915	EP1710915	EP1710915	
				ASA (GHD) 2015. EISLs - Comm / Ind 60% species protection level	ASA (GHD) 2015. HISLs- Industrial (direct Contact)	ASA (GHD) 2017. HBSC Comm / Ind (after FSANZ TDI)	WA DER - 2017. Health Based Screening Levels Comm / Ind												
	COPC	Unit	LOR					<0.0002	0.0009	<0.0002	<0.0002	<0.0002	<0.0002	<0.05	0.0017	<0.0002	0.0002	<0.0002	<0.0002
Per- & Polyfluoroalkyl Subst.	Sum of PFAS	mg/kg	0.0002					<0.0002	0.0009	<0.0002	<0.0002	<0.0002	<0.0002	<0.01	<0.0002	<0.0002	0.0002	<0.0002	<0.0002
	Sum of PFAS (WA DER List)	mg/kg	0.0002					<0.0002	0.0009	<0.0002	<0.0002	<0.0002	<0.0002	<0.01	<0.0002	<0.0002	0.0002	<0.0002	<0.0002
	10:2 FTS	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	8:2 FTS	mg/kg	0.0005	3.73	240			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	6:2 FTS	mg/kg	0.0005	NA	900			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	4:2 FTS	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	MeFOSAA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.01	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	N-Me-FOSA	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	N-Me-FOSE	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	0.0017	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	PFPeS	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFHpS	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	EtFOSAA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.01	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFPeA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	FOSA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFBS	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFDS	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFTeDA	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	PFTrDA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	N-Et-FOSA	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	PFDoA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFHpA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFHxA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	N-Et-FOSE	mg/kg	0.0005					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	PFDoA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFNA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	PFUnA	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
PFOA	mg/kg	0.0002	3.73	240	680		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
PFOS	mg/kg	0.0002	4.71	90			<0.0002	0.0009	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	
PFHxS	mg/kg	0.0002				100	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Sum (PFHxS + PFOS)	mg/kg	0.0002					<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	

Data Comments
#1 Quantification of linear and branched isomers has been conducted as a single total response using the relative Legend

WA DER (2017) Interim Guideline on the Assessment and Management of PFAS. Health Based Screening Level - Commercial and Industrial Landuse
Airservices (GHD) (2017) Derivation of PFAS Soil and Water Criteria - Health Based Screening Criteria (HBSC) - Commercial / Industrial Landuse - Based on FSANZ TDI 2017
Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Human Health Interim Screening levels (HISLs)- Industrial (direct contact only)
Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Ecological Interim Screening levels (EISLs)- Commercial and industrial at 60% protection, low reliability

LOR = Limit of Reporting

- = not analysed

mg/kg = milligrams per kilogram

							APEC 3B											
							Location		SB1711		SB1712		SB1713		SB1714		SB17071	
							Field ID	SB1711_031017_0-0.1	SB1711_031017_0.1-0.5	SB1712_031017_0-0.1	SB1712_031017_0.1-0.5	SB1713_031017_0-0.1	SB1713_031017_0.1-0.5	SB1714_031017_0-0.1	SB1714_031017_0.1-0.5	SB17071_031017_0-0.1	SB17071_031017_0.1-0.5	
							Sample Depth	0-0.1	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0.1-0.5	
							Sample Date	03-Oct-17	03-Oct-17	03-Oct-17	03-Oct-17	03-Oct-17	03-Oct-17	03-Oct-17	03-Oct-17	03-Oct-17	03-Oct-17	
							Sample Type	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	
							Lab Report No.	EP1710913	EP1710913	EP1710913	EP1710913	EP1710913	EP1710913	EP1710913	EP1710913	EP1710913	EP1710913	EP1710913
													</					

Legend
CRC Care 2011 Table B4 Soil HSL Direct Contact (Int. Main, Worker)
CRC Care 2011 Table B4 Combind D Soil HSL Direct Contact
NEPM 2013 Table 1A(3) Combind D Soil HSL for Vapour Intrusion, Sand
LOR = Limit of Reporting
TRH = Total Recoverable Hydrocarbons
BTEXN = Benzene, Toluene, Ethylbenzene, Xylene and Naphthalene
- = not analysed
mg/kg = milligrams per kilogram
NL = Not Limiting
NL (Csat in mg/kg) - The soil saturation concentration (Csat) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds Csat, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as NL (NEPM, 2013).

				APEC 4											
				Location		SB1722		SB1723		SB1724				SB1725	
				Field ID		SB1722_0_0_0.1	SB1722_0.1_0.5	SB1723_0_0_0.1	SB1723_0.1_0.5	SB1724_0_0_0.1	SB1724_0.1_0.5	SQA06_120917	SQA05_120917	SB1725_0_0_0.1	SB1725_0.1_0.5
				Sample Depth		0-0.1	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0.1-0.5	0.1-0.5	0.1-0.5	0-0.1	0.1-0.5
				Sample Date		12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17
				Sample Type		Primary	Primary	Primary	Primary	Primary	Primary	Duplicate	Triplicate	Primary	Primary
				Lab Report No.		EP1710035	EP1710035	EP1710035	EP1710035	EP1710035	EP1710035	EP1710035	562900	EP1710035	EP1710035

APEC 5																					
Location				SB1715		SB1716				SBW1717		SB1718		SB1719		SB1720		SB1721			
Field ID				SB1715_0_0_0.1	SB1715_0.1_0.5	SB1716_0_0_0.1	SB1716_0.1_0.5	SQA01_120917	SQA02_120917	SB1717_0_0_0.1	SB1717_0.1_0.5	SB1718_0_0_0.1	SB1718_0.1_0.5	SB1719_0_0_0.1	SB1719_0.1_0.5	SB1720_0_0_0.1	SB1720_0.1_0.5	SB1721_0_0_0.1	SB1721_0.1_0.5		
Sample Depth				0-0.1	0.1-0.5	0-0.1	0.1-0.5	0.1-0.5	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0.1-0.5		
Sample Date				12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17		
Sample Type				Primary	Primary	Primary	Primary	Duplicate	Triplicate	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary		
Lab Report No.				EP1710035	EP1710035	EP1710035	EP1710035	EP1710035	562900	EP1710035	EP1710035	EP1710035	EP1710035	EP1710035	EP1710035	EP1710035	EP1710035	EP1710035	EP1710035		
TRH	COPC	Unit	LOR	0-1m																	
	C6-C10 fraction	mg/kg	10																	<10	<10
	C6-C10 fraction (minus BTEX)(F1)	mg/kg	10	290	26000	82000														<10	<10
	>C10-C16 fraction	mg/kg	50																	<50	<50
	>C10-C16 (minus Naphthalene)(F2)	mg/kg	50	NL	20000	62000														<50	<50
	>C16-C34 fraction	mg/kg	100		27000	85000														<100	<100
	>C34-C40 fraction	mg/kg	100		38000	120000														<100	<100
	>C10-C40 fraction (sum)	mg/kg	50																	<50	<50
BTEXN	Benzene	mg/kg	0.2	3	430	1100														<0.2	<0.2
	Toluene	mg/kg	0.5	NL	99000	120000														<0.5	<0.5
	Ethylbenzene	mg/kg	0.5	NL	27000	85000														<0.5	<0.5
	m&p-Xylene	mg/kg	0.5																	<0.5	<0.5
	o-Xylene	mg/kg	0.5																	<0.5	<0.5
	Total Xylenes	mg/kg	0.5	230	81000	130000														<0.5	<0.5
	Total BTEX	mg/kg	0.2																	<0.2	<0.2
Naphthalene (VOC)				mg/kg	1	NL														<1	<1

Legend

CRC Care 2011 Table B4 Soil HSL Direct Contact (Int. Main, Worker)

CRC Care 2011 Table B4 Combined D Soil HSL Direct Contact

NEPM 2013 Table 1A(3) Combined D Soil HSL for Vapour Intrusion, Sand

LOR = Limit of Reporting

TRH = Total Recoverable Hydrocarbons

BTEXN = Benzene, Toluene, Ethylbenzene, Xylene and Naphthalene

- = not analysed

mg/kg = milligrams per kilogram

NL = Not Limiting

NL (Csat in mg/kg) - The soil saturation concentration (Csat) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds Csat, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as NL (NEPM, 2013).

APEC 6																			
Location				MW1701				SBW1702				SB1703		SB1704		SB1705			
Field ID	SB1701_021017 0.0-0.10				SQA11_021017	SQA12_021017	SB1701_021017 0.1-0.5	SB1702_021017 0.0-0.1				SQA14_031017	SQA15_031017	SB1702_021017 0.1-0.5		SB1703_021017 0.0-0.1		SB1703_021017 0.1-0.5	
Sample Depth	0-0.1				0-0.1	0-0.1	0.1-0.5	0-0.1				0-0.1	0-0.1	0.1-0.5		0-0.1		0.1-0.5	
Sample Date	02-Oct-17				02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17				03-Oct-17	03-Oct-17	02-Oct-17		02-Oct-17		02-Oct-17	
Sample Type	Primary				Duplicate	Triplicate	Primary	Primary				Triplicate	Duplicate	Primary		Primary		Primary	
Lab Report No.	EP1710915				EP1710915	565739	EP1710915	EP1710915				565919	EP1710913	EP1710915		EP1710915		EP1710915	
				NEPM 2013 Table 1A(3) Commin'd D Soil HSL for Vapour Intrusion, Sand	CRC Care 2011 Table B4 Comin'd D Soil HSL Direct Contact	CRC Care 2011 Table B4 Soil HSL Direct Contact (Int. Main. Worker)													
TRH	COPC	Unit	LOR	0-1m															
	C6-C10 fraction	mg/kg	10			<10	<10	<20	<10	<10	<20	<10	<10	<10	<10	<10	<10	<10	<10
	C6-C10 fraction (minus BTEX)(F1)	mg/kg	10	260	26000	82000	<10	<10	<20	<10	<10	<20	<10	<10	<10	<10	<10	<10	<10
	>C10-C16 fraction	mg/kg	50				<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	>C10-C16 (minus Naphthalene)(F2)	mg/kg	50	NL	20000	62000	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	>C16-C34 fraction	mg/kg	100		27000	85000	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	>C34-C40 fraction	mg/kg	100		38000	120000	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
BTEX	>C10-C40 fraction (sum)	mg/kg	50				<50	<50	-	<50	<50	-	<50	<50	<50	<50	<50	<50	<50
	Benzene	mg/kg	0.2	3	430	1100	<0.2	<0.2	<0.1	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Toluene	mg/kg	0.5	NL	99000	120000	<0.5	<0.5	<0.1	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Ethylbenzene	mg/kg	0.5	NL	27000	85000	<0.5	<0.5	<0.1	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	m&p-Xylene	mg/kg	0.5				<0.5	<0.5	<0.2	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	o-Xylene	mg/kg	0.5				<0.5	<0.5	<0.1	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Total Xylenes	mg/kg	0.5	230	81000	130000	<0.5	<0.5	<0.3	<0.5	<0.5	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Total BTEX	mg/kg	0.2				<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Naphthalene (VOC)	mg/kg	1	NL			<1	<1	<0.5	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<1

Legend
CRC Care 2011 Table B4 Soil HSL, Direct Contact (Int. Main. Worker)
CRC Care 2011 Table B4 Comin'd D Soil HSL Direct Contact
NEPM 2013 Table 1A(3) Commin'd D Soil HSL for Vapour Intrusion, Sand
LOR = Limit of Reporting
TRH = Total Recoverable Hydrocarbons
BTEXN = Benzene, Toluene, Ethylbenzene, Xylene and Naphthalene
- = not analysed
mg/kg = milligrams per kilogram
NL = Not Limiting
NL (Csat in mg/kg) - The soil saturation concentration (Csat) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds Csat, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as NL. (NEPM, 2013).

					APEC 6													
					Location		SB1706			SB1707			SB1708		SB1709		SB1710	
					Field ID	SB1706_021017 0.0-0.1	SB1706_021017 0.1-0.5	SB1707_021017 0.0-0.1	SQA14_021017	SQA13_021017	SB1707_021017 0.1-0.5	SB1708_021017 0.0-0.1	SB1708_021017 0.1-0.5	SB1709_021017 0.0-0.1	SB1709_021017 0.1-0.5	SB1710_021017 0.0-0.1	SB1710_021017 0.1-0.5	
					Sample Depth	0-0.1	0.1-0.5	0-0.1	0-0.1	0-0.1	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0.1-0.5	0-0.1	0.1-0.5	
					Sample Date	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	02-Oct-17	
					Sample Type	Primary	Primary	Primary	Duplicate	Triplicate	Primary	Primary	Primary	Primary	Primary	Primary	Primary	
					Lab Report No.	EP1710915	EP1710915	EP1710915	EP1710915	565739	EP1710915	EP1710915	EP1710915	EP1710915	EP1710915	EP1710915	EP1710915	
					</													

Legend
CRC Care 2011 Table B4 Soil HSL Direct Contact (Int. Main. Worker)
CRC Care 2011 Table B4 Combined D Soil HSL Direct Contact
NEPM 2013 Table 1A(3) Combined D Soil HSL for Vapour Intrusion, Sand
LOR = Limit of Reporting
TRH = Total Recoverable Hydrocarbons
BTEXN = Benzene, Toluene, Ethylbenzene, Xylene and Naphthalene
- = not analysed
mg/kg = milligrams per kilogram
NL = Not Limiting
NL (Csat in mg/kg) - The soil saturation concentration (Csat) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds Csat, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as NL (NEPM, 2013).

Table T2
Groundwater Gauging Data

APECs	Monitoring Well ID	Date	Total Well Depth (m)	Depth to Water (mbtoc)	Casing RL (mAHD)	Groundwater Elevation (mAHD)	Easting MGA94	Northing MGA94	Comments
APEC 1	MW22	18-Oct-17	5.500	1.822			401329.096	6466578.570	
	MW26	18-Oct-17	5.530	2.020			401376.639	6466602.479	
	MW29	18-Oct-17	4.900	1.840			401282.900	6466594.842	
	MW34	18-Oct-17	10.300	1.652			401281.823	6466636.326	
	MW35	18-Oct-17	3.000	1.624			401284.680	6466633.257	
	MW37	18-Oct-17	5.450	1.462			401351.790	6466543.844	
APEC 2	MW0220	18-Oct-17	4.420	0.950			401970.470	6466265.410	
	MW0221	18-Oct-17	4.410	1.545			401940.990	6466149.820	
APEC 3A	MWFTG-1	18-Oct-17	4.700	2.678			403289.810	6467345.710	
	MWFTG-2	18-Oct-17	4.800	3.023			403278.795	6467328.291	
	MWFTG-3	18-Oct-17	8.721	3.331			403363.594	6467277.226	
APEC 3B	MW0216	18-Oct-17	10.220	5.243			403647.720	6467769.480	
	MW1708	18-Oct-17	8.850	6.441	17.718	11.277	403695.981	6467724.282	
APEC 4	MW1706	18-Oct-17	4.520	1.972	14.040	12.068	402766.830	646132.288	
	ONW5	18-Oct-17	5.200	2.458			402952.570	6467072.121	Well ID Required.
APEC 5	MW1704	18-Oct-17	4.500	1.802	17.662	15.860	403033.817	6466046.795	
	MW1705	18-Oct-17	6.030	1.449	18.440	16.991	403323.563	6466013.351	
	MW0179	18-Oct-17	15.650	1.751			403274.000	6466333.000	
	MW0179D	18-Oct-17	2.810	0.875			403274.000	6466333.000	
	MW1701	18-Oct-17	3.760	1.974	17.916	15.942	63200.454	263314.265	
APEC 6	MW1702	19-Oct-17	4.500	1.836	17.118	15.282	63280.644	263724.586	
	MW1703	18-Oct-17	4.500	2.077	18.528	16.451	401415.7779	6464036.326	
	ONW6	19-Oct-17	4.520	1.260			401636.0134	6464685.561	Well ID Required.
	MW0154	18-Oct-17	2.930	1.949			404002.000	6463297.000	
Overall	MW0146	18-Oct-17	8.950	5.858			403063.000	6468102.000	
	MW0180	18-Oct-17	7.160	2.402			401376.00	6466425.00	
	MW0120N	18-Oct-17	4.650	1.949			404201.000	6466882.000	note: MW0120N was not sampled due to a data logger installed and a nearby well was sampled - co-ordinates provided for this well. Well ID required.
	MW0147		Not sampled - data logger installed				402369	6468040	
	MW0172	18-Oct-17	6.650	2.564			400937	6465610	
	MW0135	18-Oct-17	4.800	1.567			401123.980	6467062.160	note: MW0135 was not sampled due to a data logger installed and a nearby well was sampled approximate 100m south-west of MW0135 - co-ordinates provided for this well. Well ID required.

Notes

MW0147 maybe also be called "MB4-S"
MW0120 may also be called "MB10-S"
MW0180 may also be called "MB8-S" or "MW0212"
MW0135 may also be called "MB17-S"
MW0123 may also be called "MB12s"

Legend

AECOM installed groundwater monitoring wells to be sureyed
mAHD = meters Australian Height Datum
m = metres
mbtoc = metres below top of casing

Table T3
Surface Water Field Chemistry

Media	Location	Sample ID	Sample Date	Dissolved Oxygen	pH	Electrical conductivity	Total Dissolved Solids	Redox Potential (Field)	Temperature	Comments
				mg/L	pH Units	µS/cm	mg/L	mV	°C	
Surface Water	APEC 1	SW05	20-Sep-17	3.2	7.01	175	114	108	19	Green, Medium Turbidity, No odour
	APEC 2	SW1717	06-Oct-17	4.91	7.5	400.3	260	29	20	Light Yellow/ brown, Odourless, Transperant
		SW1718	06-Oct-17	6.32	7.28	91.2	59	34	14.3	Light Brown, Odourless, Transparent
	APEC 3A	SW1719	-	-	-	-	-	-	-	DRY
		SW1720	04-Oct-17	7.82	8.64	345.7	225	52	25.2	Light Yellow, odourless, transperant
	APEC 4	SW1721	12-Sep-17	6.47	8.17	179.6	117	245	19.4	Yellow, transperant, with green algae
	APEC 5	SW1713	20-Sep-17	9.37	6.99	725	471	76	24.2	Clear, low turbidity, no odour
		SW1724	12-Sep-17	8.46	8.05	297.7	194	264	20.7	Brown/yellow, odourless, transparent
		SW1722	12-Sep-17	6.35	7.99	236.2	154	219	18.4	Brown/Yellow, odourless, transparent, suspended organics
		SW1723	12-Sep-17	7.77	7.9	500.1	325	243	20.6	Yellow, odourless, transperant
	APEC 6	SW1707	21-Sep-17	6.22	7.83	90	59	61	20.3	Clear, low turbidity, no odour
		SW1706	03-Oct-17	4.28	5.51	139.2	90	131	19.3	Dark Brown, medium turbidity, odourless
	North West of APEC 6	SW1704	21-Sep-17	3.9	7.2	489	318	55	19.7	Clear, low turbidity, no odour
	South of APEC 6	SW1703	21-Sep-17	5.82	7.51	463	301	42	19.7	Clear, low turbidity, no odour
	Northern Boundary	SW1709	20-Sep-17	113	6.99	571	371	99	22.3	Brown, low turbidity, No odour
	Northern Boundary	SW1708	20-Sep-17	6.94	6.94	508	330	120	19	Brown, medium turbidity, No odour
	Airside - East of Runway	SW1714	20-Sep-17	10.67	7.07	345	224	94	26.7	Brown, low turbidity, No odour
	Airside - East of Runway	SW1702	20-Sep-17	5.19	6.95	483	314	106	23.6	Brown, medium turbidity, No Odour
	Landside - North of Airport Runway	SW1710	20-Sep-17	114	7.1	655	426	91	23.2	Light Brown, low turbidity, No odour
	Western Boundary	SW1705	20-Sep-17	3.94	6.76	395.4	257	97	18.3	Green, low turbidity, No odour
	Eatern Boundary - Munday Swamp	SW1711	20-Sep-17	4.35	6.85	722	469	79	18.1	Clear, low turbidity, no odour
	Eastern Boundary	SW1715	21-Sep-17	3.97	6.98	526	342	32	18.2	Clear, low turbidity, no odour
	Eastern Boundary	SW1701	21-Sep-17	2.23	7.05	428	278	51	19.1	Clear, low turbidity, no odour
	Landside - Central (Horrie Miller Drive)	SW1712	21-Sep-17	43.6	7.15	373	242	19	19.1	Clear, low turbidity, no odour

Legend

L = Litres
mg/L = milligrams per litre
µS/cm = micro Siemens per centimetre
mV = millivolts
°C = degrees Celsius
*TDS is calculated as EC x 0.65

Notes

MW0147 maybe also be called "MB4-S"
MW0120 may also be called "MB10-s"
MW0180 may also be called "MB8-5" or "MW0212"
MW0135 may also be called "MB17-s"
MW0123 may also be called "MB12s"

Table T4
Groundwater Field Chemistry

Location	Sample ID	Sample Date	Dissolved Oxygen	pH	Electrical conductivity	Total Dissolved Solids	Redox Potential (Field)	Temperature	Comments
			mg/L	pH Units	µS/cm	mg/L	mV	°C	
Overall Well	MW0180	03-Oct-17	0.7	6.34	1472	957	26.6	21.6	Light brown, odourless, slightly turbid
	MW0154	03-Oct-17	0.31	6.75	1544	1004	-47	18.8	Light yellow, odourless, transparent
	MW0120	17-Oct-17	Not Sampled, Data Logger						
	MW0120N	17-Oct-17	4.71	5.39	120.9	79	225.5	19.9	Data Logger with MW0120, well further north picked up with no Well ID on well. Light Yellow, moderate turbidity, odourless
	MW0147	03-Oct-17	Not Sampled due to a data logger installed						
	MW0172	21-Sep-17	13.8	6.6	782	508	-85	18.6	Brown, low turbidity, no odour
	MW0146	21-Sep-17	2.5	6.88	1220	793	51	19.6	Clear, low turbidity, no odour
	MW0135	17-Oct-17	0.08	7.08	969	630	33	19.5	Not sampled due to data logger installed. Nearby well sampled with no well ID. Colorless, Transparent, odourless.
	MW0123		Not accessible due to flooding						
APEC 1	MW22	09-Oct-17	0.2	6.52	463.8	301	-23	22.6	Odourless, colorless, transparent, bubbles/foam when sampling
	MW26	09-Oct-17	0.17	7.07	783	509	-21	24	Transparent, very light brown color, odourless
	MW29	09-Oct-17	0.3	6.01	426.5	277	28	23.6	Light Yellow, odourless, transparent
	MW34	09-Oct-17	0.33	7.32	1114	724	-54	24.7	Odourless, colorless, transparent
	MW35	09-Oct-17	0.55	5.7	392.2	255	-20	24.3	Dark brown, odourless, high turbidity, foam/bubbles formed when sampling
	MW37	09-Oct-17	0.45	6.28	909	591	72	23.1	Odourless, yellow/brown, transparent
APEC 2	MW0221	06-Oct-17	0.27	5.82	136.8	89	-164	23.3	Sulfur odour, yellow, transparent
	MW0220	06-Oct-17	0.38	7.73	154	100	-107	22.8	Brown, high turbidity, slight sulfur odour
APEC 3A	ONW4		Not found						
	MWFTG-3	04-Oct-17	6.39	6.52	4911	3192	73	20.8	Transparent, odourless, colorless
	MWFTG-1	04-Oct-17	5.43	6.66	3626	2357	46	19.1	Light Yellow, odourless, transparent
	MWFTG-2	04-Oct-17	0.31	6.89	2435	1583	-173	19.4	Transparent, odourless, colorless, foam/bubbles in jar when sampling
APEC 3B	MW1708	17-Oct-17	0.34	5.97	1790	1164	53	20.6	White, odourless, opaque
	MW0216	18-Oct-17	1.56	4.98	238.9	155	234	21.9	Colorless, odourless, low turbidity
APEC 4	MW1706	04-Oct-17	4.6	6.67	353.6	230	115	17.2	Light yellow, very slight sulfur odour, slight turbidity
	ONW5	04-Oct-17	0.32	6.48	516.7	336	-224	18.5	Moderate turbidity, light brown, odourless
APEC 5	MW0179	18-Oct-17	4.37	6.94	193.9	126	75	21.3	Odourless, colorless, transparent
	MW0179D	18-Oct-17	0.52	7.15	852	554	46	20.2	Odourless, colorless, transparent
	MW1705	06-Oct-17	1.68	6.35	508.3	330	36	19.9	Odourless, colorless, transparent
	MW1704	06-Oct-17	1.63	5.59	878	571	-8	20.2	Brown yellow, odourless, transparent
APEC 6	ONW6	19-Oct-17	-	5.86	159.7	104	-148	18	Dark brown sulfur odour, Transparent
	MW1701	19-Oct-17	-	4.38	660	429	-62	19.4	Dark brown, strong sulfur odour, transparent ASS indicative
	MW1702	08-Nov-17	1.02	5.53	454	295	2.1	22	Brown, medium turbidity, no odour
	MW1703	18-Oct-17	-	5.78	180.7	117	-157	18.8	Sulfur odour, high turbidity, brown/yellow, foams when sampled

Legend

L = Litres
mg/L = milligrams per litre
µS/cm = micro Siemens per centimetre
mV = millivolts
°C = degrees Celsius
*TDS is calculated as EC x 0.65

Notes

MW0147 maybe also be called "MB4-S"
MW0120 may also be called "MB10-s"
MW0180 may also be called "MB8-5" or "MW0212"
MW0135 may also be called "MB17-s"
MW0123 may also be called "MB12s"

Table T5a
Surface Water Analytical Results - PFAS

								APEC 1	APEC 2		APEC 3A	APEC 4	APEC 5					APEC 6				
			Location	SW05	SW1717	SW1718	SW1720	SW1721	SW1722	SW1722	SW1722	SW1722	SW1723	SW1724	SW1703	SW1704	SW1706	SW1707				
			Sample Date	20-Sep-17	06-Oct-17	06-Oct-17	04-Oct-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	21-Sep-17	21-Sep-17	03-Oct-17	21-Sep-17				
			Sample Type	Primary	Primary	Primary	Primary	Primary	Primary	Duplicate	Triplicate	Primary	Primary	Primary	Primary	Primary	Primary	Primary				
			Field ID	SW05_200917	SW1717_061017	SW1718_061017	SW1720_041017	SW1721_120917	SW1722_120917	WQA01_120917	WQA02_120917	SW1723_120917	SW1724_120917	SW1703_210917	SW1704_210917	SW1706_031017	SW1707_210917					
			Lab Report No.	EP1710405	EP1711124	EP1711124	EP1711070	EP1710035	EP1710035	EP1710035	562900	EP1710035	EP1710035	EP1710473	EP1710473	EP1711070	EP1710473					
			DoH (2017) Drinking water	WA DER (2017) Drinking Water	WA DER (2017) Non-Potable Use and Recreational	WA DER 2017 Highly disturbed systems FW 90% species protection	WA DER 2017 Highly disturbed systems FW 80% species protection	Airservices (GHD) (2015) EISLs (toxicity effects on aquatic organisms)														
COPC	Unit	LOR																				
Perfluorobutanoic acid	µg/L	0.1						<0.1	<0.1	<0.1	0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				
Per- and Polyfluoroalkyl Substances																						
10:2 FTS	µg/L	0.05						<0.05	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.05				
8:2 FTS	µg/L	0.05						<0.05	<0.05	<0.05	10.5	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.05				
6:2 FTS	µg/L	0.05						<0.05	<0.05	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				
4:2 FTS	ug/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.05	<0.05				
MeFOSAA	µg/L	0.02						<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02				
PFPeS	µg/L	0.02						<0.02	0.81	0.04	0.15	<0.02	0.12	0.12	0.11	<0.02	0.12	<0.02				
PFHpS	µg/L	0.02						<0.02	0.43	0.02	0.29	<0.02	0.08	0.07	0.07	<0.02	0.07	<0.02				
EtFOSAA	µg/L	0.02						<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02				
PFPeA	ug/L	0.02						<0.02	0.29	<0.02	0.64	<0.02	0.06	0.06	0.07	<0.02	0.05	<0.02				
N-Me-FOSA	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				
N-Me-FOSE	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				
FOSA	µg/L	0.02						<0.02	<0.02	<0.02	0.09	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02				
PFBS	µg/L	0.02						<0.02	0.67	<0.02	0.25	<0.02	0.08	0.08	0.08	<0.02	0.08	0.04				
PFDS	µg/L	0.02						<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	-				
PFTeDA	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.05	<0.05				
PFTrDA	µg/L	0.02						<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02				
N-Et-FOSA	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				
PFDoA	µg/L	0.02						<0.02	<0.02	<0.02	1.78	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02				
PFHpA	µg/L	0.02						<0.02	0.31	<0.02	0.3	<0.02	0.06	0.06	0.04	<0.02	0.04	<0.02				
PFHxA	µg/L	0.02						0.02	1.21	0.06	1.06	<0.02	0.31	0.3	0.23	0.02	0.26	0.02				
N-Et-FOSE	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				
PFDoA	µg/L	0.02						<0.02	<0.02	<0.02	0.15	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02				
PFNA	µg/L	0.02						<0.02	<0.02	<0.02	0.84	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02				
PFUnA	µg/L	0.02						<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02				
PFOA	µg/L	0.01	0.56	5	50	632	1,824	2900	0.02	0.42	0.02	0.7	0.01	0.13	0.14	0.09	<0.01	0.09				
PFOS	µg/L	0.01			5	2	31	6.66	0.24	15	1.33	33.1	0.14	4.62	4.47	4.8	0.07	2.53				
PFHxS	µg/L	0.02			5	2	31		0.1	4.37	0.68	1.19	0.08	1.62	1.57	1.5	0.07	1.51				
Sum of PFAS			µg/L	0.01					0.38	23.5	2.15	51.7	0.23	7.08	6.87	6.99	0.16	4.75				
Sum of PFAS (WA DER List)			µg/L	0.01					0.38	22.3	2.09	48.3	0.23	6.88	6.68	6.81	0.16	4.56				
Sum (PFHxS + PFOS)			ug/L	0.01	0.07	0.5	5	2	31				0.34	19.4	2.01	34.3	0.22	6.24				

Data Comments
#1 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.

Legend
DoH (2017) Australian Drinking Water Guideline – Based on FSANZ (2017) Health Based Guidance Values for PFAS
WA DER (2017) Drinking Water
WA DER (2017) Non-potable and recreational
WA DER (2017) Highly disturbed systems - 90% species protection
WA DER (2017) Highly disturbed systems - 80% species protection
Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Ecological Interim Levels (EISLs) (toxicity effects on aquatic organisms)

LOR = Limit of Reporting
- = not analysed
µg/L = micrograms per litre
NL = Not Limiting

Table T5a
Surface Water Analytical Results - PFAS

			Overall Surface Water Locations																	
			Location	SW1701	SW1702	SW1705			SW1708	SW1709	SW1710	SW1711	SW1712	SW1713	SW1714	SW1715	SW1716			
			Sample Date	21-Sep-17	20-Sep-17	20-Sep-17	20-Sep-17	20-Sep-17	20-Sep-17	20-Sep-17	20-Sep-17	20-Sep-17	20-Sep-17	21-Sep-17	20-Sep-17	20-Sep-17	20-Sep-17	21-Sep-17	03-Oct-17	
			Sample Type	Primary	Primary	Primary	Duplicate	Triplicate	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	
			Field ID	SW1701_210917	SW1702_200917	SW1705_200917	WQA03_200917	WQA04_200917	SW1708_200917	SW1709_200917	SW1710_200917	SW1711_200917	SW1712_210917	SW1713_200917	SW1714_200917	SW1715_210917	SW1716_031017			
Lab Report No.			EP1710473	EP1710405	EP1710405	EP1710405	564136	EP1710405	EP1710405	EP1710405	EP1710405	EP1710405	EP1710473	EP1710405	EP1710405	EP1710473	EP1711070			
			DoH (2017) Drinking water	WA DER (2017) Drinking Water	WA DER (2017) Non-Potable Use and Recreational	WA DER 2017 Highly disturbed systems FW 90% species protection	WA DER 2017 Highly disturbed systems FW 80% species protection	Airservices (GHD) (2015) EISLs (toxicity effects on aquatic organisms)												
COPC	Unit	LOR																		
Perfluorobutanoic acid			µg/L	0.1					<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Per- and Polyfluoroalkyl Substances																				
10:2 FTS	µg/L	0.05							<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 FTS	µg/L	0.05							<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 FTS	µg/L	0.05							<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 FTS	ug/L	0.05							<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
MeFOSAA	µg/L	0.02							<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
PFPeS	µg/L	0.02							<0.02	<0.02	<0.02	0.02	0.02	0.1	0.05	<0.02	<0.02	<0.02	<0.02	<0.02
PFHpS	µg/L	0.02							<0.02	<0.02	<0.02	<0.02	<0.01	0.06	0.03	<0.02	<0.02	<0.02	<0.02	<0.02
EtFOSAA	µg/L	0.02							<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
PFPeA	ug/L	0.02							<0.02	<0.02	<0.02	<0.02	<0.01	0.05	0.04	<0.02	<0.02	<0.02	<0.02	<0.02
N-Me-FOSA	µg/L	0.05							<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Me-FOSE	µg/L	0.05							<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
FOSA	µg/L	0.02							<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
PFBS	µg/L	0.02							<0.02	<0.02	<0.02	<0.02	0.02	0.07	0.04	<0.02	<0.02	<0.02	<0.02	<0.02
PFDS	µg/L	0.02							-	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	-	<0.02	<0.02
PFTeDA	µg/L	0.05							<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PFTiDA	µg/L	0.02							<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Et-FOSA	µg/L	0.05							<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PFDoA	µg/L	0.02							<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
PFHpA	µg/L	0.02							<0.02	<0.02	<0.02	<0.02	<0.01	0.04	0.03	<0.02	<0.02	<0.02	<0.02	<0.02
PFHxA	µg/L	0.02							<0.02	<0.02	0.03	0.03	0.02	0.22	0.12	0.03	<0.02	<0.02	0.05	<0.02
N-Et-FOSE	µg/L	0.05							<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PFDoA	µg/L	0.02							<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
PFNA	µg/L	0.02							<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
PFUnA	µg/L	0.02							<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
PFOA	µg/L	0.01	0.56	5	50	632	1,824	2900	<0.01	<0.01	0.02	0.01	0.01	0.08	0.05	0.01	0.01	<0.01	<0.01	0.02
PFOS	µg/L	0.01			5	2	31	6.66	<0.01	0.07	0.34	0.31	0.34	2.25	1.18	0.26	0.03	<0.01	0.02	0.39
PFHxS	µg/L	0.02			5	2	31		<0.02	0.1	0.25	0.25	0.17	0.96	0.54	0.18	0.03	<0.02	0.03	0.22
Sum of PFAS	µg/L	0.01							<0.01	0.17	0.64	0.62	0.58	3.83	2.08	0.48	0.07	<0.01	0.05	0.68
Sum of PFAS (WA DER List)	µg/L	0.01							<0.01	0.17	0.64	0.6	0.56	3.67	2	0.48	0.07	<0.01	0.05	0.68
Sum (PFHxS + PFOS)	ug/L	0.01	0.07	0.5	5	2	31		<0.01	0.17	0.59	0.56	0.51	3.21	1.72	0.44	0.06	<0.01	0.05	0.61

Data Comments
#1 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.

Legend
DoH (2017) Australian Drinking Water Guideline – Based on FSANZ (2017) Health Based Guidance Values for PFAS
WA DER (2017) Drinking Water
WA DER (2017) Non-potable and recreational
WA DER (2017) Highly disturbed systems - 90% species protection
WA DER (2017) Highly disturbed systems - 80% species protection
Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Ecological Interim Levels (EISLs) (toxicity effects on aquatic organisms)

LOR = Limit of Reporting
- = not analysed
µg/L = micrograms per litre
NL = Not Limiting

Table T5b
Surface Water Analytical Results - Hydrocarbons

								APEC 1	APEC 2		APEC 3A	APEC 4	APEC 5					APEC 6				
								Location	SW05	SW1717	SW1718	SW1720	SW1721	SW1722	SW1722	SW1722	SW1723	SW1724	SW1706	SW1707	SW1703	SW1704
								Sample Date	20-Sep-17	06-Oct-17	06-Oct-17	04-Oct-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	12-Sep-17	03-Oct-17	21-Sep-17	21-Sep-17	21-Sep-17
								Sample Type	Primary	Primary	Primary	Primary	Primary	Primary	Duplicate	Triplicate	Primary	Primary	Primary	Primary	Primary	Primary
								Field ID	SW05_200917	SW1717_061017	SW1718_061017	SW1720_041017	SW1721_120917	SW1722_120917	WQA01_120917	WQA02_120917	SW1723_120917	SW1724_120917	SW1706_031017	SW1707_210917	SW1703_210917	SW1704_210917
Lab Report No.	EP1710405	EP1711124	EP1711124	EP1711070	EP1710035	EP1710035	562900	EP1710035	EP1710035						EP1711070	EP1710473	EP1710473	EP1710473				

Legend
CRC Care 2011 Table B2 GW HSL Intrusive Maintenance Worker (Shallow Trench), Sand
WA DER 2014 Domestic Non-
Airport Regulations 1997
NEPM 2013 - GILs Freshwater
NEPM 2013 Table 1A(4) Rec HSL C
LOR = Limit of Reporting
- = not analysed
µg/L = micrograms per litre

Table T5b
Surface Water Analytical Results - Hydrocarbons

							Overall Surface Water Locations														
							Location	SW1701	SW1702	SW1705	SW1705	SW1705	SW1708	SW1709	SW1710	SW1711	SW1712	SW1713	SW1714	SW1715	SW1716
							Sample Date	21-Sep-17	20-Sep-17	20-Sep-17	20-Sep-17	20-Sep-17	20-Sep-17	20-Sep-17	20-Sep-17	20-Sep-17	21-Sep-17	20-Sep-17	20-Sep-17	21-Sep-17	03-Oct-17
							Sample Type	Primary	Primary	Primary	Duplicate	Triplicate	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
							Field ID	SW1701_210917	SW1702_200917	SW1705_200917	WQA03_200917	WQA04_200917	SW1708_200917	SW1709_200917	SW1710_200917	SW1711_200917	SW1712_210917	SW1713_200917	SW1714_200917	SW1715_210917	SW1716_031017
Lab Report No.	EP1710473	EP17170405	EP17170405	EP17170405	564136	EP17170405	EP17170405	EP17170405	EP17170405	EP17170405	EP17170473	EP17170405	EP17170405	EP17170473	EP17171070						
COPC			Unit	LOR																	
Total Recoverable Hydrocarbons																					
C6-C10 fraction			µg/L	20																	
C6-C10 fraction (minus BTEX)(F1)			µg/L	20	NL				6000												
>C10-C16 fraction			µg/L	100																	
>C10-C16 (minus Naphthalene)(F2)			µg/L	100	NL	1000			NL										390	<100	
>C16-C34 fraction			µg/L	100		900													690	110	
>C34-C40 fraction			µg/L	100		900													110	<100	
>C10-C40 fraction (sum)			µg/L	100															1190	110	
BTEXN																					
Benzene			µg/L	1	NL	10	300	950	5000												
Toluene			µg/L	2	NL	25			NL												
Ethylbenzene			µg/L	2	NL	3			NL												
m&p-Xylene			µg/L	2				200													
o-Xylene			µg/L	2				350													
Total Xylenes			µg/L	2	NL	20			NL												
Total BTEX			µg/L	1																	
Naphthalene (VOC)			µg/L	5	NL			16	NL												

Legend
CRC Care 2011 Table B2 GW HSL Intrusive Maintenance Worker (Shallow Trench), Sand
WA DER 2014 Domestic Non-
Airport Regulations 1997
NEPM 2013 - GILs Freshwater
NEPM 2013 Table 1A(4) Rec HSL C
LOR = Limit of Reporting
- = not analysed
µg/L = micrograms per litre

Table T6a
Groundwater Analytical Results - PFAS

			APEC 1							APEC 2		APEC 3A								
			Location	MW22	MW26	MW29	MW34	MW35	MW37			MW0220	MW0221	MW-FTG1	MW-FTG2	MW-FTG3				
			Sample Date	09-Oct-17	09-Oct-17	09-Oct-17	09-Oct-17	09-Oct-17	09-Oct-17	09-Oct-17	09-Oct-17	06-Oct-17	06-Oct-17	04-Oct-17	04-Oct-17	04-Oct-17				
			Sample Type	Primary	Primary	Primary	Primary	Primary	Primary	Duplicate	Triplicate	Primary	Primary	Primary	Primary	Primary				
			Field ID	MW22_091017	MW26_091017	MW29_091017	MW34_091017	MW35_091017	MW37_091017	WQA16_091017	WQA17_091017	MW0220_061017	MW0221_061017	MWFTG-1_041017	MWFTG-2_041017	MWFTG-3_041017				
			Lab Report No.	EP1711196	EP1711196	EP1711196	EP1711196	EP1711196	EP1711196	EP1711196	566796	EP1711124	EP1711124	EP1711070	EP1711070	EP1711070				
			DoH (2017) Drinking water	WA DER (2017) Drinking Water	WA DER (2017) Non-Potable Use and Recreational	WA DER 2017 Highly disturbed systems FW 90% species protection	WA DER 2017 Highly disturbed systems FW 80% species protection	Airservices (GHD) (2015) EISLs (toxicity effects on aquatic organisms)												
COPC	Unit	LOR																		
Per- and Polyfluoroalkyl Subst																				
Perfluorobutanoic acid	µg/L	0.1						<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	7.5	<0.1	2.8	9	2.6		
10:2 FTS	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05		
8:2 FTS	µg/L	0.05						0.15	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05		
6:2 FTS	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.31	<0.05	0.33	3.33	0.24		
4:2 FTS	ug/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05		
MeFOSAA	µg/L	0.02						<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02		
PFPeS	µg/L	0.02						1.27	0.06	0.29	0.59	1.28	0.02	<0.02	0.02	78	0.02	27.9	117	23.8
PFHpS	µg/L	0.02						0.88	0.1	0.32	0.28	0.9	0.02	<0.02	0.02	41.2	<0.02	15.8	78.3	2.28
EiFOSAA	µg/L	0.02						<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
PFPeA	ug/L	0.02						0.76	0.03	0.52	0.27	0.54	<0.02	<0.02	0.02	21.1	<0.02	24.9	49.3	14.6
N-Me-FOSA	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Me-FOSE	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
FOSA	µg/L	0.02						<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	0.09	<0.02	<0.02	
PFBS	µg/L	0.02						0.9	<0.02	0.11	0.56	0.97	<0.02	<0.02	0.02	66.1	<0.02	28.7	85.6	21.8
PFDS	µg/L	0.02						<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
PFTeDA	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	
PFTdA	µg/L	0.02						<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Et-FOSA	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
PFdCA	µg/L	0.02						0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	0.64	0.2	0.36	
PFHpA	µg/L	0.02						0.48	<0.02	0.12	0.14	0.35	<0.02	<0.02	0.01	25	<0.02	10.7	28.8	11.4
PFHxA	µg/L	0.02						2.37	0.13	0.68	1.06	2.52	0.06	0.05	0.03	97.5	0.04	59.1	213	53.3
N-Et-FOSE	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
PFDoA	µg/L	0.02						<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	
PFNA	µg/L	0.02						0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	0.46	<0.02	4	3.69	3.78	
PFUnA	µg/L	0.02						<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	
PFHxS	µg/L	0.02			5	2	31	13.5	1.31	3.99	4.54	11.1	0.33	0.34	0.19	339	0.21	217	645	127
PFOA	µg/L	0.01	0.56	5	50	632	1,824	0.88	0.06	0.6	0.28	1.17	0.04	0.04	0.03	32.6	<0.01	19.1	63.3	15.6
PFOS	µg/L	0.01			5	2	31	43.6	8.54	44.9	12.8	60.8	0.21	0.18	0.2	778	0.68	563	1510	27.4
Sum of PFAS	µg/L	0.01						64.9	10.2	51.5	20.5	79.6	0.68	0.61	0.54	1490	0.95	974	2810	304
Sum of PFAS (WA DER List)	µg/L	0.01						62.6	10.1	50.9	19.6	77.4	0.64	0.61	0.5	1370	0.93	926	2610	274
Sum (PFHxS + PFOS)	ug/L	0.01	0.07	0.5	5	2	31	57.1	9.85	48.9	17.3	71.9	0.54	0.52	0.39	1120	0.89	780	2160	154

Data Comments
#1 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.

Legend

DoH (2017) Australian Drinking Water Guideline – Based on FSA NZ (2017) Health Based Guidance Values for PFAS
WA DER (2017) Drinking Water
WA DER (2017) Non-potable and recreational
WA DER (2017) Highly disturbed systems - 90% species protection
WA DER (2017) Highly disturbed systems - 80% species protection
Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Ecological Interim Levels (EISLs) (toxicity effects on aquatic organisms)

LOR = Limit of Reporting
- = not analysed
µg/L = micrograms per litre
NL = Not Limiting

Table T6a
Groundwater Analytical Results - PFAS

								APEC 3B				APEC 4			
			Location	MW0216	MW1708			MW1706			ONW5				
			Sample Date	18-Oct-17	17-Oct-17	17-Oct-17	17-Oct-17	04-Oct-17	04-Oct-17	04-Oct-17	04-Oct-17				
			Sample Type	Primary	Primary	Duplicate	Triplicate	Primary	Duplicate	Triplicate	Primary				
			Field ID	MW0216_181017	MW1708_171017	WQA07_181017	WQA08_181017	MW1706_041017	WQA05_031017	WQA06_041017	ONW5_041017				
			Lab Report No.	EP1711644	EP1711644	EP1711644	568454	EP1711070	EP1711070	566735	EP1711070				
			DoH (2017) Drinking water	WA DER (2017) Drinking Water	WA DER (2017) Non-Potable Use and Recreational	WA DER 2017 Highly disturbed systems FW 90% species protection	WA DER 2017 Highly disturbed systems FW 80% species protection	Airservices (GHD) (2015) EISLs (toxicity effects on aquatic organisms)							
COPC	Unit	LOR													
Per- and Polyfluoroalkyl Subst															
Perfluorobutanoic acid	µg/L	0.1						6.5	1.7	<0.1	<0.05	<0.1	<0.1	<0.05	<0.1
10:2 FTS	µg/L	0.05						<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.01	<0.05
8:2 FTS	µg/L	0.05						<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.01	<0.05
6:2 FTS	µg/L	0.05						1.98	0.4	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 FTS	ug/L	0.05						<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.01	<0.05
MeFOSAA	µg/L	0.02						<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.02
PFPeS	µg/L	0.02						44.4	21.4	0.06	0.08	<0.02	<0.02	<0.01	0.54
PFHpS	µg/L	0.02						28.3	2.97	<0.02	0.03	<0.02	<0.02	<0.01	0.22
EtFOSAA	µg/L	0.02						<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.02
PFPeA	ug/L	0.02						23.5	5.81	<0.02	0.01	<0.02	<0.02	0.01	0.36
N-Me-FOSA	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Me-FOSE	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
FOSA	µg/L	0.02						<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.02
PFBS	µg/L	0.02						37.4	21.3	0.04	0.05	<0.02	<0.02	<0.01	0.06
PFDS	µg/L	0.02						<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.01	<0.02
PFTeDA	µg/L	0.05						<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.01	<0.05
PFTrDA	µg/L	0.02						<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.01	<0.02
N-Et-FOSA	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PFDoA	µg/L	0.02						<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.01	<0.02
PFHpA	µg/L	0.02						33	5.9	0.02	<0.01	<0.02	<0.02	0.01	0.24
PFHxA	µg/L	0.02						175	40.3	0.08	0.09	0.03	0.04	<0.01	0.94
N-Et-FOSE	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PFDoA	µg/L	0.02						<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.01	<0.02
PFNA	µg/L	0.02						2.7	<0.02	<0.02	<0.01	<0.02	<0.02	<0.01	0.07
PFUnA	µg/L	0.02						<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.01	<0.02
PFHxS	µg/L	0.02			5	2	31	396	111	0.55	0.85	0.05	0.04	0.02	8.19
PFOA	µg/L	0.01	0.56	5	50	632	1,824	74.5	10.5	<0.01	0.02	<0.01	<0.01	<0.01	0.23
PFOS	µg/L	0.01			5	2	31	826	7.4	1.43	2.2	<0.01	<0.01	0.01	7.05
Sum of PFAS	µg/L	0.01						1650	229	2.18	3.33	0.08	0.08	<0.1	17.9
Sum of PFAS (WA DER List)	µg/L	0.01						1570	204	2.12	3.22	0.08	0.08	0.05	17.1
Sum (PFHxS + PFOS)	ug/L	0.01	0.07	0.5	5	2	31	1220	118	1.98	3.05	0.05	0.04	0.03	15.2

Data Comments
#1 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.
Legend

DoH (2017) Australian Drinking Water Guideline – Based on FSANZ (2017) Health Based Guidance Values for PFAS
WA DER (2017) Drinking Water
WA DER (2017) Non-potable and recreational
WA DER (2017) Highly disturbed systems - 90% species protection
WA DER (2017) Highly disturbed systems - 80% species protection
Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Ecological Interim Levels (EISLs) (toxicity effects on aquatic organisms)

LOR = Limit of Reporting
- = not analysed
µg/L = micrograms per litre
NL = Not Limiting

Table T6a
Groundwater Analytical Results - PFAS

									APEC 5						APEC 6			
			Location	MW1704	MW1705			MW0179	MW0179D	MW1701	MW1702	MW1703	ONW6					
			Sample Date	06-Oct-17	06-Oct-17	06-Oct-17	06-Oct-17	18-Oct-17	18-Oct-17	19-Oct-17	08-Nov-17	18-Oct-17	19-Oct-17					
			Sample Type	Primary	Primary	Duplicate	Triplicate	Primary	Primary	Primary	Normal	Primary	Primary					
			Field ID	MW1704_061017	MW1705_061017	WQA11_061017	WQA12_061017	MW0179_181017	MW0179D_181017	MW1701_191017	MW1702_081117	MW1703_181017	ONW6_191017					
			Lab Report No.	EP1711124	EP1711124	EP1711124	566601	EP1711644	EP1711644	EP1711644	EP1712548	EP1711644	EP1711644					
			DoH (2017) Drinking water	WA DER (2017) Drinking Water	WA DER (2017) Non-Potable Use and Recreational	WA DER 2017 Highly disturbed systems FW 90% species protection	WA DER 2017 Highly disturbed systems FW 80% species protection	Airservices (GHD) (2015) EISLs (toxicity effects on aquatic organisms)										
COPC	Unit	LOR																
Per- and Polyfluoroalkyl Subst																		
Perfluorobutanoic acid	µg/L	0.1						0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1		
10:2 FTS	µg/L	0.05						<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05		
8:2 FTS	µg/L	0.05						<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05		
6:2 FTS	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
4:2 FTS	ug/L	0.05						<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05		
MeFOSAA	µg/L	0.02						<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.05	<0.02		
PFPeS	µg/L	0.02						0.52	0.09	0.07	0.05	<0.02	1.07	0.06	<0.02	0.06		
PFHpS	µg/L	0.02						0.24	0.08	0.06	0.06	<0.02	0.18	0.02	<0.05	<0.02		
EtFOSAA	µg/L	0.02						<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02		
PFPeA	ug/L	0.02						0.31	<0.02	<0.02	0.01	<0.02	0.34	<0.02	0.35	<0.02		
N-Me-FOSA	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.15	<0.05	<0.05		
N-Me-FOSE	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05		
FOSA	µg/L	0.02						<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.4	<0.02	<0.02		
PFBS	µg/L	0.02						0.1	0.06	0.07	0.04	<0.02	0.79	<0.02	<0.05	0.05		
PFDS	µg/L	0.02						<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02		
PFTeDA	µg/L	0.05						<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	0.15	<0.05	<0.05		
PFTtDA	µg/L	0.02						<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	4.14	<0.02		
N-Et-FOSA	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.09	<0.05	<0.05		
PFDCa	µg/L	0.02						<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.05	<0.02		
PFHpA	µg/L	0.02						0.24	<0.02	<0.02	0.02	0.03	0.18	0.04	<0.02	<0.02		
PFHxA	µg/L	0.02						1.56	0.15	0.13	0.08	0.06	1.38	0.06	0.13	0.06		
N-Et-FOSE	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.82	<0.05		
PFDoA	µg/L	0.02						<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.05	<0.02		
PFNA	µg/L	0.02						<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02		
PFUnA	µg/L	0.02						<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02		
PFHxS	µg/L	0.02			5	2	31	11.3	1.07	0.88	0.73	0.17	7.39	0.57	<0.02	0.52		
PFOA	µg/L	0.01	0.56	5	50	632	1,824	0.27	0.05	0.05	0.05	0.05	0.38	0.01	<0.02	<0.01		
PFOS	µg/L	0.01			5	2	31	15.8	2.72	2.45	2.4	0.32	14.1	0.16	3.6	1.43		
Sum of PFAS	µg/L	0.01						30.4	4.22	3.71	3.44	0.63	25.8	0.92	9.83	2.12		
Sum of PFAS (WA DER List)	µg/L	0.01						29.7	4.05	3.58	3.33	0.63	24.6	0.84	9.28	2.06		
Sum (PFHxS + PFOS)	ug/L	0.01	0.07	0.5	5	2	31	27.1	3.79	3.33	3.13	0.49	21.5	0.73	7.74	1.95		

Data Comments
#1 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.
Legend

DoH (2017) Australian Drinking Water Guideline – Based on FSANZ (2017) Health Based Guidance Values for PFAS
WA DER (2017) Drinking Water
WA DER (2017) Non-potable and recreational
WA DER (2017) Highly disturbed systems - 90% species protection
WA DER (2017) Highly disturbed systems - 80% species protection
Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Ecological Interim Levels (EISLs) (toxicity effects on aquatic organisms)

LOR = Limit of Reporting
- = not analysed
µg/L = micrograms per litre
NL = Not Limiting

Table T6a
Groundwater Analytical Results - PFAS

			Overall											
			Location	MW0120N	MW0135				MW0146	MW0154	MW0172	MW0180		
			Sample Date	17-Oct-17	17-Oct-17	17-Oct-17	17-Oct-17	21-Sep-17	03-Oct-17	21-Sep-17	04-Oct-17	03-Oct-17	03-Oct-17	
			Sample Type	Primary	Primary	Duplicate	Triplicate	Primary	Primary	Primary	Primary	Duplicate	Triplicate	
			Field ID	MW0120N_171017	MW0135_171017	WQA01_171017	WQA02_171017	MW0146_210917	MW0154_031017	MW0172_210917	MW0180_031017	WQA01_031017	WQA02_031017	
			Lab Report No.	EP1711644	EP1711644	EP1711644	568454	EP1710473	EP1711070	EP1710473	EP1711070	EP1711070	566735	
			DoH (2017) Drinking water	WA DER (2017) Drinking Water	WA DER (2017) Non-Potable Use and Recreational	WA DER 2017 Highly disturbed systems FW 90% species protection	WA DER 2017 Highly disturbed systems FW 80% species protection	Airservices (GHD) (2015) EISLs (toxicity effects on aquatic organisms)						
COPC	Unit	LOR												
Per- and Polyfluoroalkyl Subst														
Perfluorobutanoic acid	µg/L	0.1						<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
10:2 FTS	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	
8:2 FTS	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	
6:2 FTS	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
4:2 FTS	ug/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	
MeFOSAA	µg/L	0.02						<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	
PFPeS	µg/L	0.02						<0.02	<0.02	<0.02	0.2	0.2	0.19	
PFHpS	µg/L	0.02						<0.02	<0.02	<0.02	0.07	0.02	<0.02	
EtFOSAA	µg/L	0.02						<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	
PFPeA	ug/L	0.02						<0.02	<0.02	<0.02	<0.02	0.03	0.03	
N-Me-FOSA	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Me-FOSE	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
FOSA	µg/L	0.02						<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	
PFBS	µg/L	0.02						<0.02	0.04	<0.02	0.02	0.03	0.08	
PFDS	µg/L	0.02						<0.02	<0.02	<0.02	<0.01	-	<0.02	
PFTeDA	µg/L	0.05						<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	
PFTiDA	µg/L	0.02						<0.02	<0.02	<0.02	<0.01	<0.02	<0.01	
N-Et-FOSA	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
PFDCa	µg/L	0.02						<0.02	<0.02	<0.02	<0.01	<0.02	<0.01	
PFHpA	µg/L	0.02						<0.02	<0.02	<0.02	<0.01	<0.02	<0.01	
PFHxA	µg/L	0.02						<0.02	<0.02	<0.02	<0.01	<0.02	<0.01	
N-Et-FOSE	µg/L	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
PFDoA	µg/L	0.02						<0.02	<0.02	<0.02	<0.01	<0.02	<0.01	
PFNA	µg/L	0.02						<0.02	<0.02	<0.02	<0.01	<0.02	<0.01	
PFUnA	µg/L	0.02						<0.02	<0.02	<0.02	<0.01	<0.02	<0.01	
PFHxS	µg/L	0.02			5	2	31	0.06	0.16	0.19	0.18	<0.02	0.05	
PFOA	µg/L	0.01	0.56	5	50	632	1,824	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	
PFOS	µg/L	0.01			5	2	31	0.09	0.04	0.06	0.08	<0.01	<0.01	
Sum of PFAS	µg/L	0.01						6.11	0.24	0.25	0.3	0.03	0.15	
Sum of PFAS (WA DER List)	µg/L	0.01						0.15	0.24	0.25	0.28	0.03	0.15	
Sum (PFHxS + PFOS)	ug/L	0.01	0.07	0.5	5	2	31	0.15	0.2	0.25	0.26	<0.01	0.05	

Data Comments
#1 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.
Legend
DoH (2017) Australian Drinking Water Guideline – Based on FSANZ (2017) Health Based Guidance Values for PFAS
WA DER (2017) Drinking Water
WA DER (2017) Non-potable and recreational
WA DER (2017) Highly disturbed systems - 90% species protection
WA DER (2017) Highly disturbed systems - 80% species protection
Airservices (GHD) (2015) Derivation of PFAS Soil and Water Criteria - Ecological Interim Levels (EISLs) (toxicity effects on aquatic organisms)
LOR = Limit of Reporting
- = not analysed
µg/L = micrograms per litre
NL = Not Limiting

Table T6b
Groundwater Analytical Results - Hydrocarbons

			APEC 1											APEC 2		APEC 3A			APEC 3B			
Location			MW22	MW28	MW29	MW34	MW35	MW37			MW0220	MW0221	MW-FTG1	MW-FTG2	MW-FTG3	MW0216	MW1708					
Sample Date			09-Oct-17	09-Oct-17	09-Oct-17	09-Oct-17	09-Oct-17	09-Oct-17	09-Oct-17	09-Oct-17	06-Oct-17	06-Oct-17	04-Oct-17	04-Oct-17	04-Oct-17	18-Oct-17	17-Oct-17	18-Oct-17	17-Oct-17			
Sample Type			Normal	Primary	Primary	Primary	Primary	Primary	Duplicate	Triplicate	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Duplicate	Triplicate			
Field ID			MW22_091017	MW28_091017	MW29_091017	MW34_091017	MW35_091017	MW37_091017	WQA16_091017	WQA17_091017	MW0220_061017	MW0221_061017	MWFTG-1_041017	MWFTG-2_041017	MWFTG-3_041017	MW0216_181017	MW1708_171017	WQA07_181017	WQA08_181017			
Lab Report No.			EP1711196	EP1711196	EP1711196	EP1711196	EP1711196	EP1711196	EP1711196	566796	EP1711124	EP1711124	EP1711070	EP1711070	EP1711070	EP1711644	EP1711644	EP1711644	568454			
			CRC Care 2011 Table B2 GW HSL Int. Main. Worker (Shallow Trench), Sand	WA DER 2014 Domestic Non-Potable Groundwater Use	Airport Regulations 1997	NEPM 2013 - GILs Freshwater	NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand															
			2-4m				2-4m															
COPC			Unit	LOR																		
Total Recoverable Hydrocarbons																						
C6-C10 fraction	µg/L	20						<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	
C6-C10 fraction (minus BTEX)(F1)	µg/L	20	NL				6000	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	
>C10-C16 fraction	µg/L	100						<100	<100	<100	<100	<100	<100	<100	130	<100	110	<100	<100	<100	<50	
>C10-C16 (minus Naphthalene)(F2)	µg/L	100	NL	1000			NL	<100	<100	<100	<100	<100	<100	<50	<100	<100	110	<100	<100	<100	-	
>C16-C34 fraction	µg/L	100		900				100	<100	<100	<100	<100	<100	<100	<100	<100	310	<100	280	<100	<100	<100
>C34-C40 fraction	µg/L	100		900				<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
>C10-C40 fraction (sum)	µg/L	100						100	<100	<100	<100	<100	<100	-	<100	<100	440	<100	390	<100	<100	-
BTEXN																						
Benzene	µg/L	1	NL	10	300	950	5000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	
Toluene	µg/L	2	NL	25			NL	<2	<2	<2	<2	<2	<2	<1	<2	<2	<2	<2	<2	<2	-	
Ethylbenzene	µg/L	2	NL	3			NL	<2	<2	<2	<2	<2	<2	<1	<2	<2	<2	<2	<2	<2	-	
m&p-Xylene	µg/L	2				200		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	-	
o-Xylene	µg/L	2				350		<2	<2	<2	<2	<2	<2	<1	<2	<2	<2	<2	<2	<2	-	
Total Xylenes	µg/L	2	NL	20			NL	<2	<2	<2	<2	<2	<2	<3	<2	<2	<2	<2	<2	<2	-	
Total BTEX	µg/L	1						<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1	-	
Naphthalene (VOC)	µg/L	5	NL			16	NL	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	-	

Legend
CRC Care 2011 Table B2 GW HSL Intrusive Maintenance Worker (Shallow Trench), Sand
WA DER 2014 Domestic Non-Potable
Airport Regulations 1997
NEPM 2013 - GILs Freshwater
NEPM 2013 Table 1A(4) Rec HSL C
LOR = Limit of Reporting
- = not analysed
µg/L = micrograms per litre
BTEXN = Benzene, Toluene, Xylene and Napthalene

Table T6b
Groundwater Analytical Results - Hydrocarbons

							APEC 4				APEC 5						APEC 6				
							Location	MW1706			ONW5	MW1704	MW1705			MW0179	MW0179D	MW1701	MW1702	MW1703	ONW6
							Sample Date	04-Oct-17	04-Oct-17	04-Oct-17	04-Oct-17	06-Oct-17	06-Oct-17	06-Oct-17	06-Oct-17	18-Oct-17	18-Oct-17	19-Oct-17	08-Nov-17	18-Oct-17	19-Oct-17
							Sample Type	Primary	Duplicate	Triplicate	Primary	Primary	Primary	Duplicate	Triplicate	Primary	Primary	Primary	Normal	Primary	Primary
							Field ID	MW1706_041017	WQA05_031017	WQA06_041017	ONW5_041017	MW1704_061017	MW1705_061017	WQA11_061017	WQA12_061017	MW0179_181017	MW0179D_181017	MW1701_191017	MW1702_081117	MW1703_181017	ONW6_191017
Lab Report No.	EP1711070	EP1711070	566735	EP1711070	EP1711124	EP1711124	EP1711124	566601	EP1711644	EP1711644	EP1711644	EP1712548	EP1711644	EP1711644							
			CRC Care 2011 Table B2 GW HSL Int. Main. Worker (Shallow Trench), Sand	WA DER 2014 Domestic Non- Potable Groundwater Use	Airport Regulations 1997	NEPM 2013 - GILs Freshwater	NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand														
			2-4m				2-4m														
COPC			Unit	LOR																	
Total Recoverable Hydrocarbons																					
C6-C10 fraction			µg/L	20					<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	
C6-C10 fraction (minus BTEX)(F1)			µg/L	20	NL		6000	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	
>C10-C16 fraction			µg/L	100				<100	<100	<50	<100	<100	<100	<50	<100	<100	<100	<100	<100	<100	
>C10-C16 (minus Naphthalene)(F2)			µg/L	100	NL	1000	NL	<100	<100	<50	<100	<100	<100	<50	<100	<100	<100	<100	<100	<100	
>C16-C34 fraction			µg/L	100		900		<100	<100	<100	280	<100	<100	<100	<100	<100	<100	<100	<100	<100	
>C34-C40 fraction			µg/L	100		900		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
>C10-C40 fraction (sum)			µg/L	100				<100	<100	-	280	<100	<100	<100	-	<100	<100	<100	<100	<100	
BTEXN																					
Benzene			µg/L	1	NL	10	300	950	5000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Toluene			µg/L	2	NL	25	NL	NL	<2	<2	<1	<2	<2	<2	<1	<2	<2	<2	<2	<2	
Ethylbenzene			µg/L	2	NL	3	NL	NL	<2	<2	<1	<2	<2	<2	<1	<2	<2	<2	<2	<2	
m&p-Xylene			µg/L	2			200	200	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
o-Xylene			µg/L	2			350	350	<2	<2	<1	<2	<2	<2	<1	<2	<2	<2	<2	<2	
Total Xylenes			µg/L	2	NL	20	NL	NL	<2	<2	<3	<2	<2	<2	<3	<2	<2	<2	<2	<2	
Total BTEX			µg/L	1					<1	<1	-	<1	<1	<1	-	<1	<1	<1	<1	<1	
Naphthalene (VOC)			µg/L	5	NL		16	NL	<5	<5	<10	<5	<5	<5	<10	<5	<5	<5	<5	<5	

Legend
CRC Care 2011 Table B2 GW HSL Intrusive Maintenance Worker (Shallow Trench), Sand
WA DER 2014 Domestic Non-Potable
Airport Regulations 1997
NEPM 2013 - GILs Freshwater
NEPM 2013 Table 1A(4) Rec HSL C
LOR = Limit of Reporting
- = not analysed
µg/L = micrograms per litre
BTEXN = Benzene, Toluene, Xylene and Napthalene

Table T6b
Groundwater Analytical Results - Hydrocarbons

										Overall									
				Location	MW0120N	MW0135				MW0146	MW0154	MW0172	MW0180						
				Sample Date	17-Oct-17	17-Oct-17	17-Oct-17	17-Oct-17	21-Sep-17	03-Oct-17	21-Sep-17	04-Oct-17	03-Oct-17	03-Oct-17					
				Sample Type	Primary	Primary	Duplicate	Triplicate	Primary	Primary	Primary	Primary	Duplicate	Triplicate					
				Field ID	MW0120N_171017	MW0135_171017	WQA01_171017	WQA02_171017	MW0146_210917	MW0154_031017	MW0172_210917	MW0180_031017	WQA01_031017	WQA02_031017					
				Lab Report No.	EP1711644	EP1711644	EP1711644	568454	EP1710473	EP1711070	EP1710473	EP1711070	EP1711070	566735					
				CRC Care 2011 Table B2 GW HSL Int. Main. Worker (Shallow Trench), Sand	WA DER 2014 Domestic Non- Potable Groundwater Use	Airport Regulations 1997	NEPM 2013 - GILs Freshwater	NEPM 2013 Table 1A(4) Comm/Ind HSL D GW for Vapour Intrusion, Sand											
															2-4m				
COPC				Unit	LOR	2-4m													
Total Recoverable Hydrocarbons																			
C6-C10 fraction	µg/L	20							<20	<20	<20	-	<20	<20	<20	<20	<20	<20	
C6-C10 fraction (minus BTEX)(F1)	µg/L	20	NL					6000	<20	<20	<20	-	<20	<20	<20	<20	<20	<20	
>C10-C16 fraction	µg/L	100							<100	<100	<100	<50	<100	<100	<100	<100	<100	<50	
>C10-C16 (minus Naphthalene)(F2)	µg/L	100	NL	1000				NL	<100	<100	<100	-	<100	<100	<100	<100	<100	<50	
>C16-C34 fraction	µg/L	100		900					<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
>C34-C40 fraction	µg/L	100		900					<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
>C10-C40 fraction (sum)	µg/L	100							<100	<100	<100	-	<100	<100	<100	<100	<100	-	
BTEXN																			
Benzene	µg/L	1	NL	10	300	950	5000		<1	<1	<1	-	<1	<1	<1	<1	<1	<1	
Toluene	µg/L	2	NL	25			NL		<2	<2	<2	-	<2	<2	<2	<2	<2	<1	
Ethylbenzene	µg/L	2	NL	3			NL		<2	<2	<2	-	<2	<2	<2	<2	<2	<1	
m&p-Xylene	µg/L	2				200			<2	<2	<2	-	<2	<2	<2	<2	<2	<2	
o-Xylene	µg/L	2				350			<2	<2	<2	-	<2	<2	<2	<2	<2	<1	
Total Xylenes	µg/L	2	NL	20			NL		<2	<2	<2	-	<2	<2	<2	<2	<2	<3	
Total BTEX	µg/L	1							<1	<1	<1	-	<1	<1	<1	<1	<1	-	
Naphthalene (VOC)	µg/L	5	NL			16	NL		<5	<5	<5	-	<5	<5	<5	<5	<5	<10	
Legend																			
CRC Care 2011 Table B2 GW HSL Intrusive Maintenance Worker (Shallow Trench), Sand																			
WA DER 2014 Domestic Non-Potable																			
Airport Regulations 1997																			
NEPM 2013 - GILs Freshwater																			
NEPM 2013 Table 1A(4) Rec HSL C																			
LOR = Limit of Reporting																			
- = not analysed																			
µg/L = micrograms per litre																			
BTEXN = Benzene, Toluene, Xylene and Napthalene																			

Appendix A

Certificates of Title

Perth Airport

WESTERN



AUSTRALIA

REGISTER NUMBER	
100/P6619	
Duplicate Edition	Date Duplicate Issued
N/A	N/A

RECORD OF CERTIFICATE OF TITLE
UNDER THE TRANSFER OF LAND ACT 1893

VOLUME 2124 FOLIO 980

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

R. G. Roberts



REGISTRAR OF TITLES

LAND DESCRIPTION:

LOT 100 ON PLAN 6619

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

COMMONWEALTH OF AUSTRALIA

(A G520494) REGISTERED 2 JULY 1997

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. T5105/1945 EASEMENT BENEFIT FOR THE PURPOSE OF EXERCISING CERTAIN DRAINAGE RIGHTS - SEE INSTRUMENT T5105/1945 AND DIAGRAM 12661. AS TO PORTION ONLY REGISTERED 25.6.1945.
2. D846708 EASEMENT BENEFIT FOR RIGHT OF CARRIAGEWAY PURPOSES - SEE INSTRUMENT D846708 AND SKETCH ON VOLUME 2124 FOLIO 980 REGISTERED 16.8.1988.
3. C370759 LEASE TO COMMONWEALTH BANKING CORPORATION OF 108-120 PITT STREET, SYDNEY, NEW SOUTH WALES EXPIRES: SEE LEASE. AS TO PORTION ONLY REGISTERED 9.6.1982.
4. D403214 LEASE TO WESTCOAST HELICOPTERS PTY LTD OF HANGAR 214, PERTH AIRPORT, GUILDFORD EXPIRES: SEE LEASE. AS TO PORTION ONLY REGISTERED 23.1.1987.
5. *D771989 CAVEAT BY HAWKER DE HAVILLAND LTD AS TO PORTION ONLY LODGED 2.6.1988.
6. *D771990 CAVEAT BY HAWKER DE HAVILLAND LTD AS TO PORTION ONLY LODGED 2.6.1988.
7. *D771991 CAVEAT BY HAWKER DE HAVILLAND LTD AS TO PORTION ONLY LODGED 2.6.1988.
8. G126337 LEASE TO AIRSERVICES AUSTRALIA OF 25 CONSTITUTION AVENUE, CANBERRA CITY, AUSTRALIAN CAPITAL TERRITORY EXPIRES: SEE LEASE. AS TO PORTION ONLY REGISTERED 15.3.1996.
9. G126338 LEASE TO AIRSERVICES AUSTRALIA OF 25 CONSTITUTION AVENUE, CANBERRA CITY, AUSTRALIAN CAPITAL TERRITORY EXPIRES: SEE LEASE. AS TO PORTION ONLY REGISTERED 15.3.1996.
10. G453151 LEASE TO AIRSERVICES AUSTRALIA OF 25 CONSTITUTION AVENUE, CANBERRA CITY, AUSTRALIAN CAPITAL TERRITORY EXPIRES: SEE LEASE. AS TO PORTION ONLY REGISTERED 21.4.1997.
11. G520492 EASEMENT BURDEN FOR RIGHT OF CARRIAGEWAY PURPOSES AND THE PURPOSE OF EXERCISING CERTAIN UTILITIES AND SERVICES RIGHTS - SEE INSTRUMENT G520492 AND SKETCH ON VOLUME 2124 FOLIO 980 REGISTERED 2.7.1997.
12. G520495 LEASE TO WESTRALIA AIRPORTS CORPORATION PTY LTD OF LEVEL 22, AMP CENTRE, 50 BRIDGE STREET, SYDNEY, NEW SOUTH WALES EXPIRES: SEE LEASE. REGISTERED

END OF PAGE 1 - CONTINUED OVER

RECORD OF CERTIFICATE OF TITLE

REGISTER NUMBER: 100/P6619

VOLUME/FOLIO: 2124-980

PAGE 2

2.7.1997.

- *G733890 MORTGAGE OF LEASE G520495 TO PERPETUAL TRUSTEE COMPANY LTD REGISTERED 10.3.1998.
- *K626842 SUB-LEASE OF LEASE G520495 TO A.B.C. DEVELOPMENTAL LEARNING CENTRES PTY LTD OF 43 METROPLEX AVENUE, MURARRIE, QUEENSLAND AS TO PORTION ONLY. EXPIRES: SEE SUB LEASE. REGISTERED 16.6.2008.
- *K626842 THE ADDRESS OF THE SUB-LESSOR IS NOW 2 GEORGE WIENCKE DRIVE, PERTH AIRPORT REGISTERED 16.6.2008.
- *K688642 CAVEAT AFFECTING LEASE G520495 , CAVEAT BY ST.GEORGE BANK LTD AS TO PORTION ONLY. LODGED 19.8.2008.
- *L111918 SUB-LEASE OF LEASE G520495 TO TOLL TRANSPORT PTY LTD OF LEVEL 8, 380 ST KILDA ROAD, MELBOURNE, VICTORIA EXPIRES: SEE SUB LEASE. AS TO PORTION ONLY - SEE DEPOSITED PLAN 49632 REGISTERED 21.10.2009.
- *L145362 SUB-LEASE OF LEASE G520495 TO NANTAY PTY LTD OF FAUNTLEROY AVENUE, PERTH AIRPORT EXPIRES: SEE SUB LEASE. AS TO PORTION ONLY - SEE DEPOSITED PLAN 59507 REGISTERED 19.11.2009.
- *L100316 MORTGAGE OF LEASE L145362 TO WESTPAC BANKING CORPORATION REGISTERED 19.11.2009.
- *L154184 CAVEAT AFFECTING LEASE G520495 , CAVEAT BY WESTPAC BANKING CORPORATION AS TO PORTION ONLY LODGED 27.11.2009.
- 13. *G520496 CAVEAT BY PERPETUAL TRUSTEE COMPANY LTD LODGED 2.7.1997.
- 14. *G876706 CAVEAT BY PACIFIC TURBINE PTY LTD AS TO PORTION ONLY LODGED 14.8.1998.
- 15. *H064445 CAVEAT BY PACIFIC TURBINE PTY LTD AS TO PORTION ONLY LODGED 26.3.1999.
- 16. *H215325 CAVEAT BY PERTH CARGO CENTRE PTY LTD AS TO PORTION ONLY LODGED 6.9.1999.
- 17. *H216798 CAVEAT BY COMMONWEALTH BANK OF AUSTRALIA AS TO PORTION ONLY LODGED 7.9.1999.
- 18. *H396522 CAVEAT BY SMART GROUP AUSTRALASIA PTY LTD AS TO PORTION ONLY LODGED 22.3.2000.
- 19. *H396523 CAVEAT BY COMMONWEALTH BANK OF AUSTRALIA AS TO PORTION ONLY LODGED 22.3.2000.
- 20. *H773638 CAVEAT BY NETWORK AVIATION PTY LTD AS TO PORTION ONLY LODGED 11.6.2001.
- 21. *I347748 CAVEAT BY AUSTRALIAN POSTAL CORPORATION AS TO PORTION ONLY LODGED 8.1.2003.
- 22. *I409137 CAVEAT BY WESTRALIA AIRPORTS CORPORATION PTY LTD AS TO PORTION ONLY LODGED 11.3.2003.
- 23. *I655737 CAVEAT BY COMMONWEALTH OF AUSTRALIA AS TO PORTION ONLY LODGED 9.10.2003.
- 24. *I874629 CAVEAT BY HUTCHISON 3G AUSTRALIA PTY LTD AS TO PORTION ONLY LODGED 5.5.2004.
- 25. *J085334 CAVEAT BY CROWN CASTLE AUSTRALIA PTY LTD AS TO PORTION ONLY LODGED 15.11.2004.
- 26. *J491600 CAVEAT BY ST GEORGE BANK LTD AS TO PORTION ONLY LODGED 31.10.2005.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.

* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.

Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: P6619 [SHEET 1].
 PREVIOUS TITLE: 1852-601.
 PROPERTY STREET ADDRESS: 2 BOUD AV, PERTH AIRPORT.
 LOCAL GOVERNMENT AREA: CITY OF BELMONT, CITY OF SWAN.

END OF PAGE 2 - CONTINUED OVER

RECORD OF CERTIFICATE OF TITLE

REGISTER NUMBER: 100/P6619

VOLUME/FOLIO: 2124-980

PAGE 3

NOTE 1:	K272348	DEPOSITED PLAN (INTEREST ONLY) 53424 LODGED
NOTE 2:	K331569	DEPOSITED PLAN (INTEREST ONLY) 53434 LODGED
NOTE 3:	J190094	DEPOSITED PLAN 43740 LODGED
NOTE 4:	J900320	DEPOSITED PLAN (INTEREST ONLY) 49638 LODGED
NOTE 5:	K635092	PENDING SURVEY - PLANS 22106 & 22107
NOTE 6:		LAND DESCRIPTION AMENDED ON ORIGINAL CERTIFICATE OF TITLE - BUT NOT SHOWN ON CURRENT EDITION OF THE DUPLICATE
NOTE 7:		SKETCH ON ORIGINAL SUPERCEDED PAPER TITLE AMENDED - BUT NOT SHOWN ON CURRENT EDITION OF THE DUPLICATE
NOTE 8:		DUP C/T NOT PRODUCED FOR DOCUMENT J872223
NOTE 9:	K627002	DEPOSITED PLAN (INTEREST ONLY) 59506 LODGED
NOTE 10:	K583172	DUP C/T NOT PRODUCED FOR DOCUMENT K583172
NOTE 11:	K850774	DEPOSITED PLAN 59540 LODGED INTEREST ONLY
NOTE 12:	K901638	DEPOSITED PLAN 43793 LODGED.
NOTE 13:	L100316	DUP C/T NOT PRODUCED FOR DOCUMENT L111918
NOTE 14:		DUP C/T NOT PRODUCED FOR DOCUMENT L145362

2 SHEETS

INDEX PLAN	
PERTH 2000 18.26	
"	19.25
"	18.27
"	19.27
"	19.26

C/T NOW 1254-870

Land Parcel Identifier amended -
Regulation 6 of Transfer of Land
(Surveys) Regulations 1895
Com. 1775-2000-01
Date: 13. 11. 9. 2006

P 006619 F 02



*Enlargement
(P^r Sh.1)*

2 SHEETS

P6619

<i>Lot Number</i>	<i>Part</i>	<i>Register Number</i>	<i>Section Sheet Number</i>	<i>Lot Number</i>	<i>Part</i>	<i>Register Number</i>	<i>Section Sheet Number</i>
100		2124/980	1				

Chansi Paul

From: [REDACTED]
Sent: Tuesday 9 March 2010 01:03 pm
To: [REDACTED]
Subject: Perth Documents 1

Attachments: Banner Sheet.pdf; D L111918.pdf; D K626842.pdf; D C370759.pdf; D D771989.pdf



Banner Sheet.pdf
(41 KB)



D L111918.pdf (2
MB)



D K626842.pdf (2
MB)



D C370759.pdf
(564 KB)



D D771989.pdf
(117 KB)

[REDACTED] Outside Clerk - Settlements
t +61 8 9429 7472 f +61 8 9429 7666
Minter Ellison Lawyers Level 49 Central Park • 152-158 St Georges Terrace • Perth • WA 6000
[REDACTED] www.minterellison.com

P Please consider the environment before printing this e-mail.

-----Original Message-----

From: [REDACTED]
Sent: Tuesday, 9 March 2010 9:40 AM
To: [REDACTED]
Subject: Req# 34004294 Ref: 60-0544833 (part 1 of 4)

Dear Customer,

This request will be delivered by 4 emails. This is email 1.

REQUEST NUMBER: 34004294
YOUR REFERENCE: 60-0544833

Please find attached information relating to this request.

If you are having difficulty opening these attachments; are concerned about the content of the attachments; or have any other queries, please contact Online Support on (08) 9273 7341 or at onlinesupport@landgate.wa.gov.au. This e-mail and any files transmitted with it are intended only for the use of the addressee(s). It may contain information that is confidential and privileged, in which case neither is intended to be waived or lost by mistaken delivery to you. If you are not an intended recipient, any use, interference with, disclosure, distribution or copying of this material is unauthorised and prohibited. If you receive this e-mail in error, please notify the sender by return e-mail and delete the message and any attachments from your system. Unless specifically indicated, this e-mail does not constitute formal advice or commitment by the sender or the Western Australian Land Information Authority (Landgate). Information in this message not relating to the official business of Landgate shall be understood as neither given nor endorsed by it. It is your responsibility to check any attachments for viruses and defects before opening or sending them on. Landgate's liability is limited to re-supplying affected attachments.

P Please consider the environment before printing this email

IMPORTANT INFORMATION - PLEASE READ

This email and any attachments are confidential and may be legally privileged (in which case neither is waived or lost by mistaken delivery). Please notify us if you have received this message in error, and remove both emails from your system. Any unauthorised use is expressly prohibited. Minter Ellison collects personal information to provide and market our services (see our privacy policy at <http://www.minterellison.com> for more information about use, disclosure and access). Minter Ellison's liability in connection with transmitting, unauthorised access to, or viruses in this message and its attachments, is limited to re-supplying this message and its attachments.

Western Australian Land Information Authority
ABN 86 574 793 858

STATEMENT SUMMARY FOR LANDGATE SEARCH SERVICE ON JOB 34004294

CUSTOMER: MINTER ELLISON LAWYERS

TICKET NO:

UNKNOWN

YOUR REF: 60-0544833

DELIVERY BOX: 119

DATE: 09/03/2010

USERID: SXF

TIME: 09:36:20

ORDER TYPE: RW

SEARCH REQUEST INFORMATION

ITEM	PRINT FEE	SEARCH FEE
<u>DOCUMENTS</u>		
<i>(Copied From Image System)</i>		
C370759	\$18.00	
All pages		
D403214	\$18.00	
All pages		
D771989	\$18.00	
All pages		
D771990	\$18.00	
All pages		
D771991	\$18.00	
All pages		
G126337	\$18.00	
All pages		
G126338	\$18.00	
All pages		
G453151	\$18.00	
All pages		
G520495	\$18.00	
All pages		
G520496	\$18.00	
All pages		

Land Enquiry - receive your search information by email

If you have any enquiries regarding this job, please contact LANDGATE using the following telephone number:

9273 7333 (Customer Services)

ITEM	PRINT FEE	SEARCH FEE
G876706	\$18.00	
All pages		
H215325	\$18.00	
All pages		
H396522	\$18.00	
All pages		
H64445	\$18.00	
All pages		
H773638	\$18.00	
All pages		
I347748	\$18.00	
All pages		
I409137	\$18.00	
All pages		
I874629	\$18.00	
All pages		
J85334	\$18.00	
All pages		
K626842	\$18.00	
All pages		
L111918	\$18.00	
All pages		
L145362	\$18.00	
All pages		

TOTAL FEE: \$396.00

GST Tax Rate 0%

*****PLEASE RETAIN THIS SUMMARY FOR YOUR RECORDS*****

*****A FEE MAY APPLY FOR DUPLICATE INFORMATION*****

Land Enquiry - receive your search information by email

If you have any enquiries regarding this job, please contact LANDGATE using the following telephone number:

9273 7333 (Customer Services)

FORM L2

WESTERN AUSTRALIA
TRANSFER OF LAND ACT 1893 AS AMENDED

SUB-LEASE

LEASE NUMBER	DESCRIPTION OF LAND (Note 1)	EXTENT	VOLUME	FOLIO
G520495	That part of the land identified as subject L on Deposited Plan 49632 and being part of : Lot 100 on Plan 6619	Part	2124	980

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS (Note 2)

Easement G520492, Caveat G520496, Mortgage G733890

SUB-LESSOR (Note 3)

Westralia Airports Corporation Pty Ltd ACN 077 153 130 formerly of Baker Road, Perth Airport and now of 2 George Wiencke Drive, Perth Airport

[also referred to as "WAC in this Sub-Lease]

SUB-LESSEE (Note 4)

Toll Transport Pty Ltd ACN 006 604 191 of Level 8, 380 St Kilda Road, Melbourne, Victoria

[also referred to as "Lessee" in this Sub-Lease]

TERM OF SUB-LEASE (Note 5)

10 years commencing 18 November 2006 together with two options to extend the term for consecutive periods of 5 years each commencing on 18 November 2016 and 18 November 2021 respectively. ✓

THE SUB-LESSOR as the proprietor of the above LEASE HEREBY SUB-LEASES TO THE SUB-LESSEE the land above described subject to the encumbrances as shown hereon being the (Note 6) ☒ part of the land in the said lease to be held by the Sub-Lessee for the above term at the clear yearly rental of (Note 7)

Four hundred and forty seven thousand dollars per annum (\$447,000.00 pa)

PAYABLE (Note 8)

In advance as hereinafter set out and subject to review as hereinafter set out

Subject to the covenants and powers implied under the Transfer of Land Act 1893 as amended (unless hereby negated or modified) and also to the covenants and conditions contained herein but, without limiting the other reservations in this Sub-Lease, reserving to the Sub-Lessor the right to install, maintain, use and alter Services (whether servicing the Premises or other premises) located in that part of the land identified as subject A on Deposited Plan 49632 and to enter the Premises for that purpose.

The following covenants by the Sub-Lessee are to be construed according to section ninety-four of the Transfer of Land Act 1893 as amended (Note 9)

The following pages comprise:

- Lease cover
- Contents - pages i-v
- Details and recitals- pages 1-3
- General terms - pages 4-47
- Schedule 1 - page 48
- Signing pages - page 49-50
- Annexure - pages 51-54
- Plan A of Premises
- Plan B of Precinct
- Mortgagee's Consent and Undertaking (5 pages + DP49632)

DATED this

~~18th~~ 9th day of September 2009

SIGNED SEALED AND DELIVERED in my presence
for and on behalf of **PERPETUAL TRUSTEE**
COMPANY LIMITED ABN 42 000 001 007 by its
Attorneys and

and

who are personally known to me and each of whom
declares that he/she has been appointed by the Board of
Directors of that company as an attorney of the company
for the purposes of the Power of Attorney dated 12 March
2002 (Registration No. I63257) and that he/she has no
notice of the revocation of his/her powers.

Signature of Witness

Full Name of Witness

C/- Perpetual
Level 11 Angel Place
123 Pitt Street
SYDNEY NSW 2000
Address of Witness

Account Executive

Office held/occupation of Witness

Signature of Attorney
ASSISTANT
MANAGER

EXECUTED by **TOLL TRANSPORT PTY**
LTD (ACN 006 604 191) in accordance with
section 127(1) of the Corporations Act 2001
(Cwlth) by authority of its directors:

Signature of director

DIRECTOR

Name of director (block letters)

Signature of director/company secretary*

*delete whichever is not applicable

Name of director/company secretary*
(block letters)

*delete whichever is not applicable

13 AUG 2009

EXECUTED by TOLL HOLDINGS LIMITED
(ACN 006 592 089) in accordance with section
127(1) of the Corporations Act 2001 (Cwlth) by
authority of its directors:

.....
Signature of director

.....
Name of director (block letters)

.....
Signature of director/company secretary*
*delete whichever is not applicable

.....
Name of director/company secretary*
(block letters)
*delete whichever is not applicable

13 AUG 2009

EXECUTED by WESTRALIA AIRPORTS
CORPORATION PTY LTD (ACN 077 153
130) in accordance with section 127(1) of the
Corporations Act 2001 (Cwlth) by authority of its
directors:

.....
Signature of director

.....
Name of director (block letters)

.....
Signature of director/company secretary*
*delete whichever is not applicable

.....
Name of director/company secretary*
(block letters)
*delete whichever is not applicable

ED/VER	AMENDMENT	BY	SIGNATURE	DATE	
--------	-----------	----	-----------	------	--

LEASE AREA
1.2898ha

ENLARGEMENT
SCALE 1:1250

FOR INTEREST PURPOSES ONLY

INITIAL INTERESTS

SUBJECT	PURPOSE	STATUTORY REFERENCE	ORIGIN	LAND BURDENED	BENEFIT TO	COMMENT
(A)	EASEMENT		DOCL.....	LOT 0 ON P 6619	WESTRALIA AIRPORT CORPORATION	SERVICE EASEMENT
(L)	LEASEHOLD		DOCL.....	LOT 0 ON P 6619		

IVY STREET ROAD

REDCLIFFE

SEE ENLARGEMENT

DIMENSIONS AND AREAS ARE DERIVED FROM THE SCDB - MARCH 2005

TYPE <u>FREEHOLD</u>	DISTRICT <u>SWAN</u>	TOWNSITE <u></u>	FORMER TENURE <u>ON</u>	FIELD BOOK <u></u>
PURPOSE <u>INTEREST</u>	LOCAL AUTHORITY <u>CITY OF BELMONT</u>		INDEX <u>BG34 (2) 19.26 & 19.27</u>	
PLAN OF <u>LEASE AREA AND/OR OTHER INTERESTS OVER LOT 0 ON P 6619</u>	LOCALITY <u>PERTH AIRPORT</u>		FILE <u></u>	
APPROVED BY <u>WESTERN AUSTRALIAN PLANNING COMMISSION</u>		IN ORDER FOR DEALING <u></u>		
DELEGATED UNDER S.16 P.D. ACT 2005		SUBJECT TO <u></u>		
DATE <u></u>		LODGED <u></u>		
SSA <u>YES/NO</u>		TYPE OF VALIDATION <u></u>		
DATE <u></u>		FULL AUDIT <u></u>		
FEE PAID <u></u>		LEGAL COMPONENT <u></u>		
ASSESS No. <u></u>		DOCKET <u></u>		
		PLAN/DIAGRAM <u></u>		
		CERTIFIED <u></u>		
		CORRECT <u></u>		
		R.S.C. <u></u>		
		F.S.C. <u></u>		
		FOR INSPECTOR OF PLANS & SURVEYS <u></u>		
		AUTHORIZED LAND OFFICER <u></u>		

SURVEYOR'S CERTIFICATE - Reg 1

RICHARD G. DELANY

I hereby certify that this plan is accurate and is a correct representation of the -

(1) - measurements and/or

(2) - calculations from measurements.

(Delete if inapplicable)

undertaken for the purposes of this plan and that I am not aware of any other person who has been or is to be consulted with the relevant written (and/or) verbal relation in which it is stated that the plan is accurate.

LICENSED SURVEYOR

Midland Survey Services

2 VICTORIA STREET
MIDLAND WA 6055
Tel: (08) 9374 3333
Fax: (08) 9374 2903

Email: info@midlandsurvey.com.au
Web: www.midlandsurvey.com.au

GOVERNMENT OF WESTERN AUSTRALIA

Department of Land Information

DEPOSITED PLAN

49632

SHEET 1 OF 1

DATE EDITION 1 VERSION 1

SCALE: 1:2500 AT A3 SIZE

ALL DISTANCE ARE IN METRES

INSPECTOR OF PLANS & SURVEYS

AUTHORIZED LAND OFFICER

ATTESTATION SHEET

Dated this	<i>9th</i>	day of	<i>September</i>	200 <i>9</i>
------------	------------	--------	------------------	--------------

SUB-LESSOR/S SIGN HERE (Note 10)

See page 49 for Sub-Lessor's signing

SUB-LESSEE/S SIGN HERE (Note 10)

See page 49 for Sub-Lessee's signing

INSTRUCTIONS

1. If insufficient space in any section, Additional Sheet, Form B1, should be used with appropriate headings. The boxed sections should only contain the words "see page ...".
2. Additional Sheets shall be numbered consecutively and bound to this document by staples along the left margin prior to execution by the parties.
3. No alteration should be made by erasure. The words rejected should be scored through and those substituted typed or written above them, the alteration being initialed by the persons signing this document and their witnesses.
4. Duplicate Lease to be produced.

NOTES

1. **DESCRIPTION OF LAND**
Lot and Diagram/Plan/Strata/Survey-Strata Plan number or Location name and number to be stated.
Extent - Whole, part or balance of the land comprised in the Certificate of Title to be stated. If part, define by recital and/or sketch. The Volume and Folio number, to be stated.
2. **LIMITATIONS, INTERESTS, ENCUMBRANCES and NOTIFICATIONS**
In this panel show (subject to the next paragraph) those limitations, interests, encumbrances and notifications affecting the land being sub-leased recorded against the lease:
(a) On the certificate(s) of title:
(iii) In the Second Schedule;
(iv) If no Second Schedule, that are encumbrances.
(b) On the lease, that are encumbrances not recorded on the certificate(s) of title.
(Unless to be removed by action or document before registration hereof)

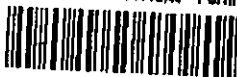
Do not show any:
(e) Easement Benefits or Restrictive/Covenant Benefits; or
(f) Subsidiary interests or changes affecting a limitation, etc, that is to be entered in the panel (eg, if a mortgage is shown, do not show any partial discharges or any document affecting either).
The documents shown are to be identified by nature and number.
The plan/diagram encumbrances shown are to be identified by nature and relevant plan/diagram. Strata/survey-strata plan encumbrances are to be described as "interests on strata/survey-strata plan".
If none show "nil".
3. **SUB-LESSOR**
State the full name of the Sub-Lessor/Sub-Lessors (Lessee as shown in Lease) and the address/addresses to which future notices can be sent.
4. **SUB-LESSEE**
State full name of the Sub-Lessee/Sub-Lessees and the address/addresses to which future notices can be sent.
5. **TERM OF LEASE**
Term of Sub-Lease must be less than Head Lease.
Term to be stated in years, months and days or as the case may be and commencement day of Sub-Lease to be shown.
6. State whole or part of land in Head Lease.
7. State amount of yearly rental in words.
8. State term of payment.
9. Insert any Covenants required.
10. **SUB-LESSOR/SUB-LESSEE EXECUTION**
A separate attestation is required for every person signing this document. Each signature should be separately witnessed by an Adult Person. The address and occupation of the witness must be stated.

EXAMINED

OFFICE USE ONLY

L111918 SL

21 Oct 2009 11:48:44 Perth



REG \$ 112.00

SUB-LEASE

LODGED BY

ADDRESS **MALLESONS STEPHEN JAUQUES**
Level 10 Central Park
152 St Georges Terrace
Perth WA 6000
PHONE NO. **TEL (08) 9269 7000 FAX (08) 9269 7999**
FAX NO. **ISSUING BOX 168 H**

REFERENCE NO. **VS: 09 5112 3196**

ISSUING BOX NO. **168 H**

PREPARED BY **MALLESONS STEPHEN JAUQUES**

ADDRESS **LEVEL 10 CENTRAL PARK**
152 ST. GEORGE'S TERRACE
PERTH 6000

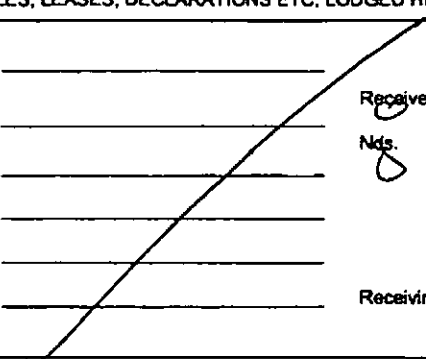
REFERENCE **VS: 09 5112 3196**

PHONE NO. **+61 8 9269 7000** FAX NO. **+61 8 9269 7999**

INSTRUCT IF ANY DOCUMENTS ARE TO ISSUE TO OTHER THAN LODGING PARTY.

2/2

TITLES, LEASES, DECLARATIONS ETC. LODGED HERewith.

1. _____		Received Items
2. _____		Nds.
3. _____		
4. _____		
5. _____		
6. _____		Receiving Clerk

Registered pursuant to the provisions of the TRANSFER OF LAND ACT 1893 as amended on the day and time shown above and particulars entered in the Register.



FORM L2

WESTERN AUSTRALIA
TRANSFER OF LAND ACT 1893 AS AMENDED

SUB-LEASE

LEASE NUMBER	DESCRIPTION OF LAND (Note 1)	EXTENT	VOLUME	FOLIO
G520495	That part of the land identified as subject L on Deposited Plan 49638 and being part of : Lot 100 on Plan 6619	Part	2124	980

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS (Note 2)

Easement G520492, Caveat G520496, Mortgage G733890

SUB-LESSOR (Note 3)

WESTRALIA AIRPORTS CORPORATION PTY LTD ACN 077 153 130 formerly of Level 22, AMP Centre, 50 Bridge Street, Sydney, New South Wales and also formerly of Baker Road, Perth Airport and now of 2 George Wiencke Drive, Perth Airport

(Also referred to as "WAC" in this Sub-lease)

SUB-LESSEE (Note 4)

A.B.C. DEVELOPMENTAL LEARNING CENTRES PTY LTD ACN 010 788 502 of 43 Metroplex Avenue, Murarrie, Queensland

(Also referred to as "Lessee" in this Sub-lease")

TERM OF SUB-LEASE (Note 5)

14 years 6 months commencing 11 March 2007 together with an option to extend the Term for a period of 15 years commencing 11 September 2021.

THE SUB-LESSOR as the proprietor of the above LEASE HEREBY SUB-LEASES TO THE SUB-LESSEE the land above described subject to the encumbrances as shown hereon being the (Note 6) part of the land in the said lease to be held by the Sub-Lessee for the above term at the clear yearly rental of (Note 7)

Thirty six thousand dollars per annum (\$36,000.00 pa)

PAYABLE (Note 8)

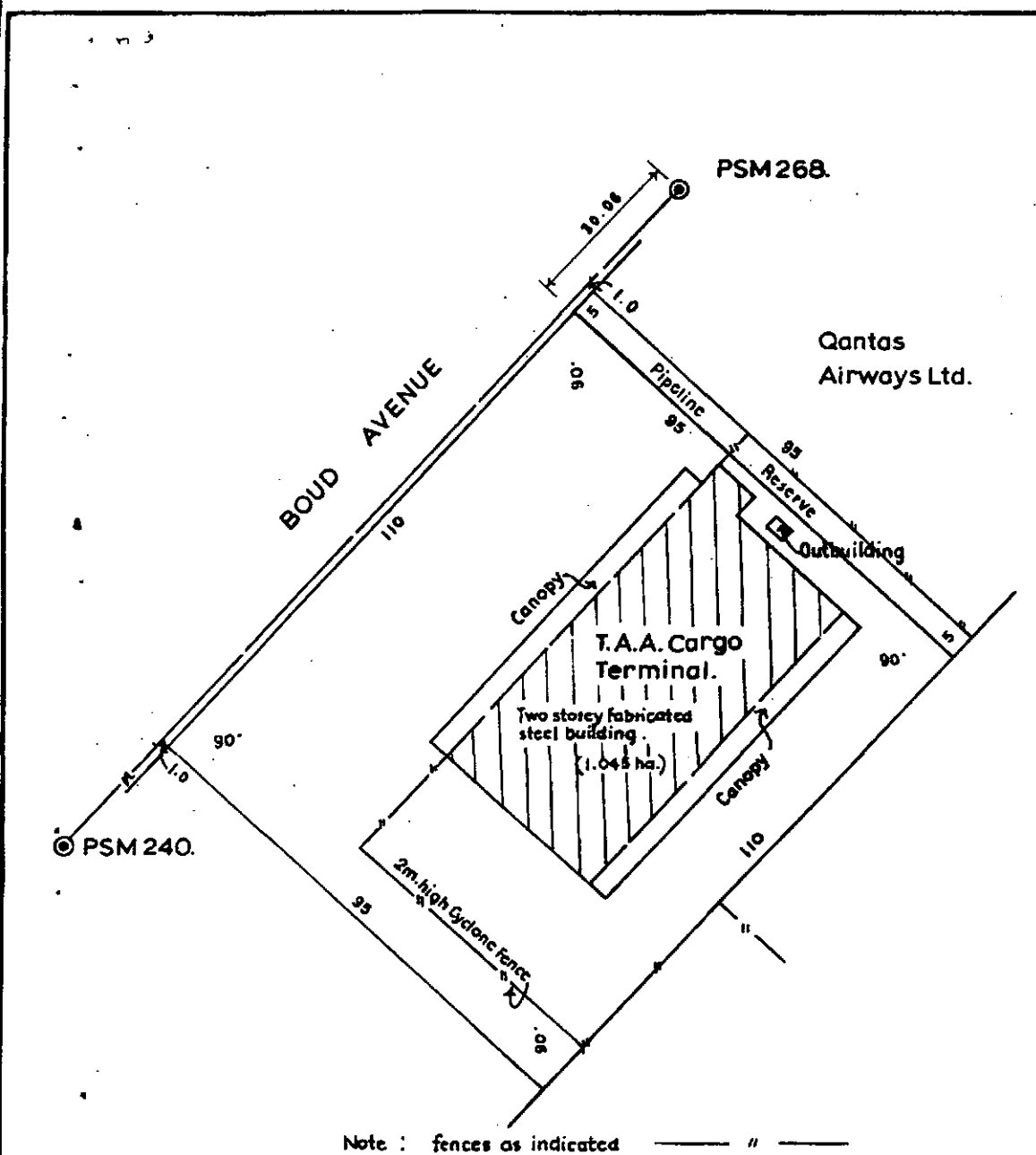
In advance as hereinafter set out and subject to review as hereinafter set out

Subject to the covenants and powers implied under the Transfer of Land Act 1893 as amended (unless hereby negated or modified) and also to the covenants and conditions contained herein but, without limiting the other reservations in this Sub-Lease, reserving to the Sub-Lessor the right to install, maintain, use and alter Services (whether servicing the Premises or other premises) located in that part of the land identified as subject A on Deposited Plan 49638 and to enter the Premises for that purpose.

The following covenants by the Sub-Lessee are to be construed according to section ninety-four of the Transfer of Land Act 1893 as amended (Note 9)

The following pages comprise:

- Cover page
- Contents - pages i - iv
- Details - pages 1 2
- General Terms - pages 3 - 47
- Signing page - pages 48 - 49
- Annexure - pages 50 - 52
- Plan A
- Plan B
- Mortgagee's Consent and Undertaking - 5 pages



Refer Department of Transport Drawing P.S. 4580/3 - dated 15.4.82.

CLIENT TRANS AUSTRALIA AIRLINES.

Sketch Plan showing Ident. Survey of buildings etc.
on Commonwealth Banking Corp. lease

Certificate of Title

PERTH AIRPORT.

FISHER • LEWIS

Consulting Surveyors

34 ST. QUENTIN AVENUE, CLAREMONT 6010.

PHONE 384 7055

Surveyed I.L. F/Bk 413 L/Bk

Scale 1 : 1000.

Datum

Drawn H. Lewis

Checked e/s.

File 2243/80.

Date 8.6.82.

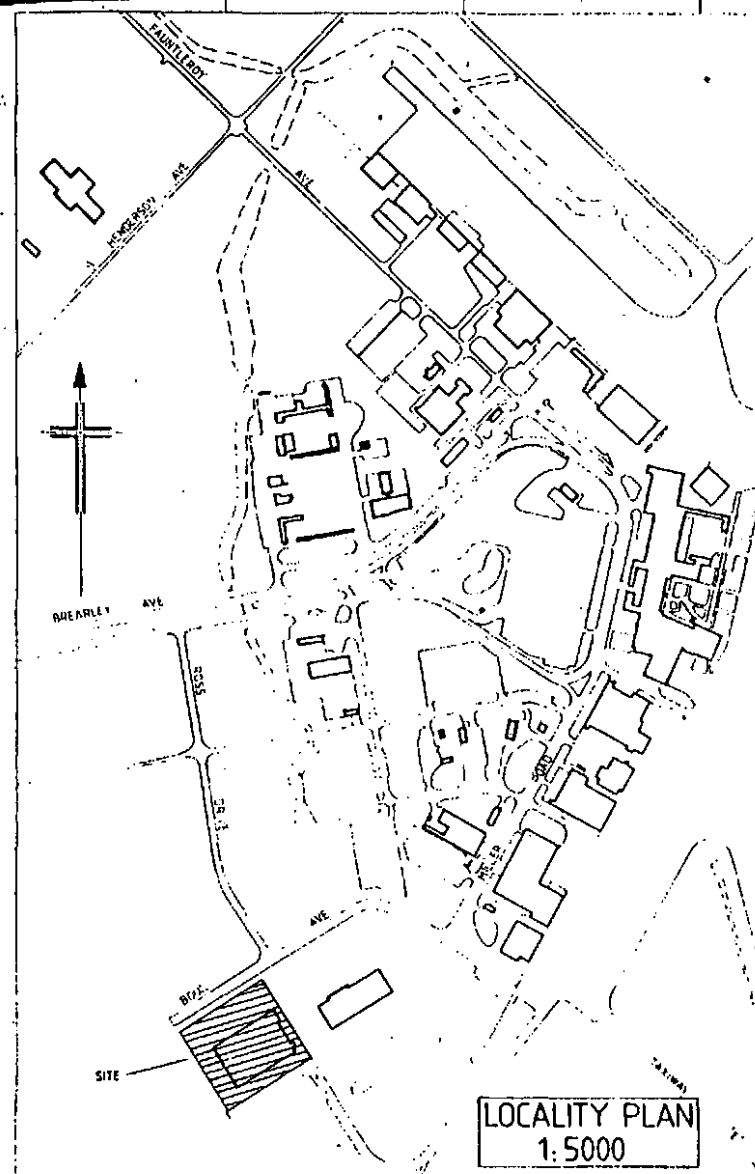
Drawing No. 4256.1.

1531 MOLTEN 1531

Q5YR
24P
AFEM
APDS
ADPP

Age Group	Percentage
0-10	10
11-20	25
21-30	45
31-40	35
41-50	20
51-60	15
61-70	10
71-80	5
81-90	2
91-100	1

10.



LOCALITY PLAN
1:5000

ROSS DRIVE

BOUD AVE.

PSM 268

QANTAS AIRWAYS LTD.
SEE PS-4476

AREA 1.045 ha.

PSM 240

TRANS-AUSTRALIA AIRLINES
SEE PS-4736

13.

1:1000

1:1 000

PERTH W.A.
COMMONWEALTH BANKING
CORPORATION

(SUB-LEASED TO TRANS-AUSTRALIA AIRLINES)
LEASE FOR CARGO TERMINAL



IN PARLIAMENT OF
**Transport
Australia**

DRAWING No
PS - 4580

SHEET
1 of 1

Page 1

DOCUMENT Nos. X C 370759

In order for registration subject to the following:

*Designation of signatory
for Lessor required.*

Haylor
16/6

(Referred o/c)

FOR REGISTRATION
BW

Drafting
Sketch - Required
re - lease

M. H. H.

Handwritten note or signature

The following covenants by the Lessee are to be construed according to section ninety-four of the Transfer of Land Act 1893 as amended.

* Here insert any of the following covenants required:
 The Lessee will not transfer or sublet.
 The Lessee will fence.
 The Lessee will cultivate.
 The Lessee will not cut timber.
 The Lessee will insure against fire in the name of the Lessor.
 The Lessee will paint outside every third year.
 The Lessee will paint and paper inside every fourth year.
 The Lessee will not use the premises as a shop.
 The Lessee will not carry on any offensive trade.
 The Lessee will carry on the business of a licensed victualler and conduct the same in an orderly manner.
 The Lessee will apply for a renewal of license.
 The Lessee will facilitate the transfer of license.

Dated this

28th

day of

MAY

1982

Lessors sign here (see note 1)

SIGNED by MAY

d. Signature Signed (d) for and on behalf of THE COMMONWEALTH OF AUSTRALIA in the presence of:

e. Signature, address and occupation of witness. (See note 2)

in the presence of (e) 84 STOCK ROAD, ATTADALE W.A.
PUBLIC SERVANT

Signed (d) [Signature]

in the presence of (e) [Signature]

f. Add attestations (f) as required.

Walter Joseph May
Business & Property Manager
Management Services
Department of Aviation

Lessees sign here (see note 1)

SIGNED by HOWLAND

Signed (d) THE ATTORNEY OF COMMONWEALTH BANKING CORPORATION for and on behalf of the said BANK in the presence of:

in the presence of (e) 110 Dorey Street
Alfred Cove
Bank Officer

Signed (d) [Signature]

in the presence of (e) COMMONWEALTH BANKING CORPORATION by its ATTORNEY

(f) [Signature]

P/A C 317494

NOTES

1. A separate attestation should be made by each person signing this document; i.e. each signature should be separately witnessed.
2. If executed within the Commonwealth of Australia or its Territories witnesses must be 21 years of age or over and not a party to this document. If executed outside the Commonwealth of Australia or its Territories the witness should be one of the persons listed in Section 145 of the Transfer of Land Act.
3. If any of the boxed sections on page 1 has insufficient space then the relevant information may be added on pages 2 and 3 herein. If further space is required use Annexure Form B1. Appropriate headings should be shown in each case. The boxed sections should only contain the words "See page 2" or "See Annexure 'A' (or as the case may be) attached". Annexure sheets should be dated, signed by the persons signing this document and their witnesses and be pinned to this form.
4. No alteration should be made by erasure. The words rejected should be scored through and those substituted typed or written above them, the alteration being initialled by the persons signing this document and their witnesses.

C 370759 L



LEASE

FEES (office use)	\$	c
	23	-

Parties THE COMMONWEALTH OF AUSTRALIA
and
COMMONWEALTH BANKING CORPORATION
PM 9:37

Lodged by FREEHILL HOLLINGDALE & PAGE
Address with MUIR WILLIAMS NICHOLSON
Phone No. LAW CHAMBERS,
CATHEDRAL SQUARE,
PERTH, 6000.

325 0421 JGS:KL 1940

Use this space for instructions if any documents are to issue to other than lodging party.

Titles, Duplicates, Declarations, etc., lodged with this document. (To be filled in by person lodging.)

1. Dup + Trip. Received items
2. No's
3.
4.
5.
6. Rec. Clerk. J

BELOW THIS LINE FOR OFFICE USE ONLY

Encumbrances not notified on face.

Endorsing instruction. S. E.

EXAMINED.

Registered

at

particulars entered in the Register Book.

Initials of Signing Officer.

REGISTRAR OF TITLES.

NOTES

1. If any of the boxed sections has insufficient space then the relevant information may be added on Annexure Form B1. Appropriate headings should be shown. The boxed sections should only contain the words "See Annexure 'A' (or as the case may be) attached". Annexure sheets should be dated, signed by the persons signing this document and be pinned to this form.
2. No alteration should be made by erasure. The words rejected should be scored through and those substituted typed or written above them, the alteration being initialled by the persons signing this document.

D 771989 C



No.

0771989

CAVEAT

FEES (office use)	\$	c
	35	—
88 JUN -2 13 1985		

Parties **Hawker De Havilland Limited**
and
The Commonwealth of Australia

Lodged by **Mallesons Stephen Jaques**
Law Chambers
Address **Cathedral Square**
Phone No. **PERTH W.A. 6000**
421 2444

Ref: **DVC:GT 101406197**

Use this space for instruction if any documents are to issue to other than lodging party.

Agreements, Duplicates, Declarations, etc., lodged with this document. (To be filled in by person lodging.)

1 <i>Dup Caveat</i>	} Received items No's 1-2 Rec. Clerk <i>[Signature]</i>
2 <i>P/C Lease</i>	
3	
4	
5	
6	

BELOW THIS LINE FOR OFFICE USE ONLY.

Lodged **2nd June 1988**
at **13-05** o'clock and
particulars entered in the Register Book.

Initials
of Signing
Officer.

[Initials]

[Signature]
REGISTRAR OF TITLES.

Endorsing
instruction.

EXAMINED. *[Signature]*

ANNEXURE

PAGE No.

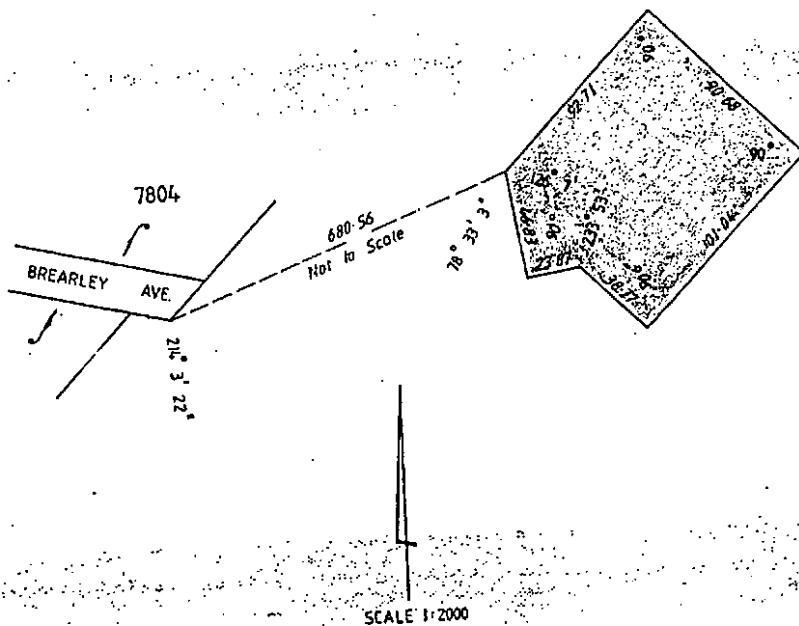
Annexure to Caveat

Dated

1st June 1988

between HAWKER DE HAVILLAND LIMITED and

THE COMMONWEALTH OF AUSTRALIA



Medlem & Stephen J...
Solicitors & Agents for the
Caveator

In the presence of:

David Court
4/30 Tain Street
Applecross
Solicitor

NOTE: Every
Annexed sheet
must be signed
at the foot of
each page by all
parties and their
witnesses and
be dated, if
more than one
page, number
consecutively.

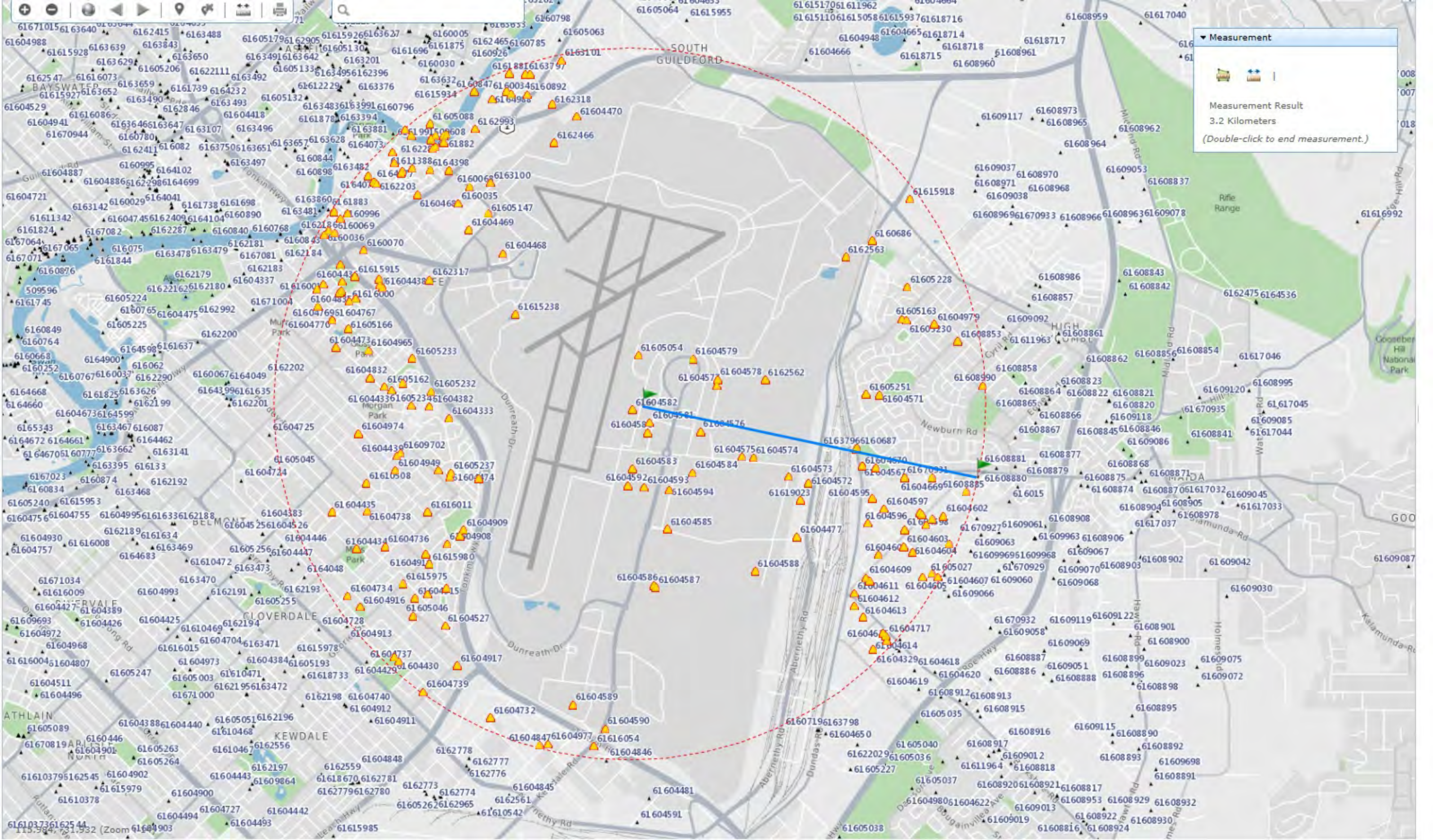
FORM APPROVAL
No. 035
REGISTRAR OF TITLES

STOCK FORM 322 (Jm) Sands & McDougall

Appendix B

Bore Information

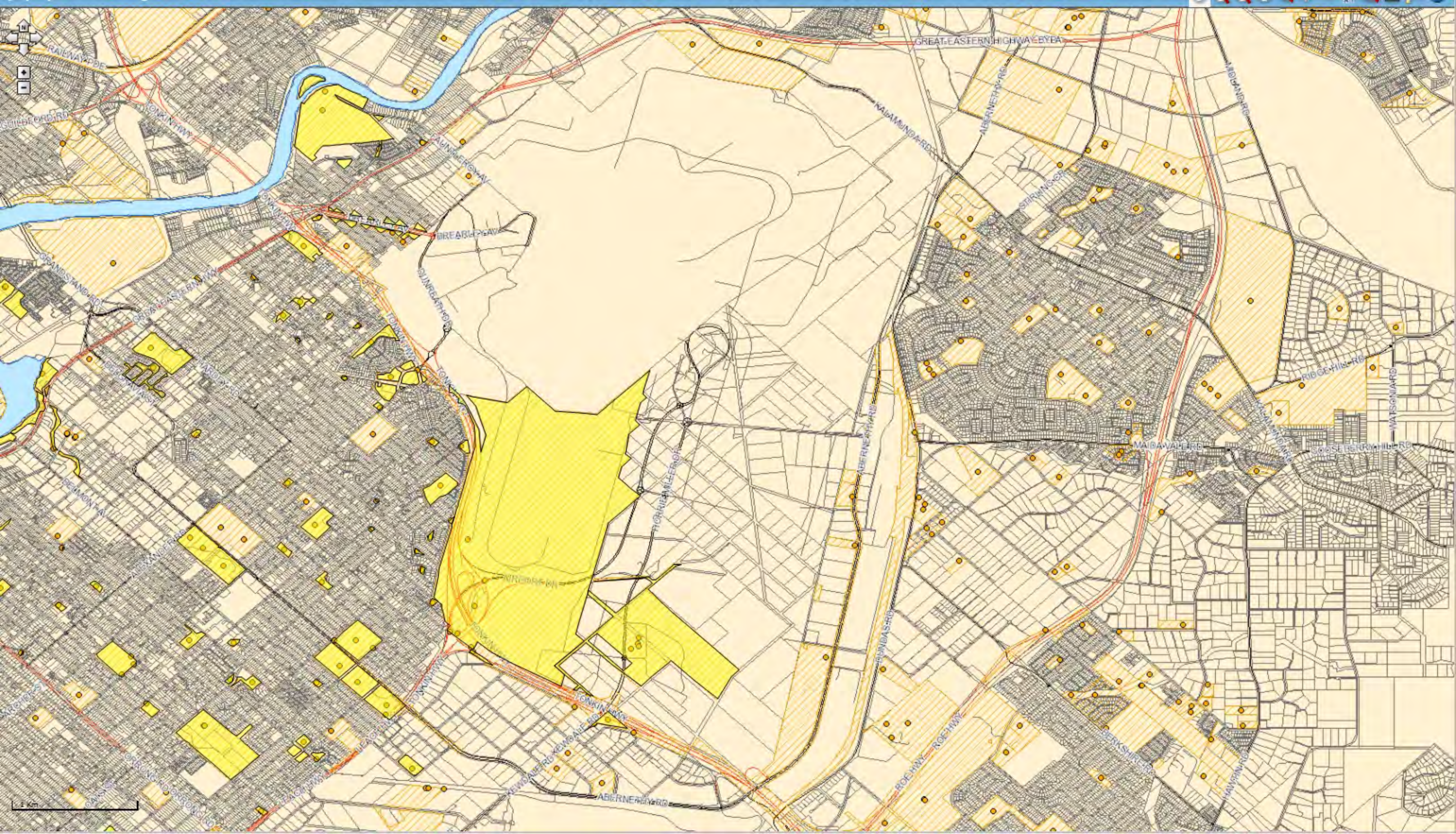
Licence Number	Registered Owner	Licence Volume
58650	Swanview Plant Farm Pty Ltd	27000 kL
61690	Pioneer Road Services Pty Ltd	20000 kL
63807	Bacchion, David	89390 kL
64694	305 DUNDAS RD HIGH WYCOMBE WA 6057	24000 kL
99732	Matthew Gibney Catholic Primary School; The Roman Catholic Archbishop of Perth	6000 kL
99843	Hazel Investments Pty Ltd	2000 kL
108239	Lancpar Pty Ltd	4280 kL
151552	Bynon, William John	15750 kL
152215	LOT 2 ARUM LILY PL HAZELMERE WA 6055	23120 kL
152794	Westrac Pty Ltd	2000 kL
154688	Fagnani, Antonio (Tony)	4000 kL
155224	60 MILNER RD HIGH WYCOMBE WA 6057	100000 kL
155429	Magee, Bryan Alexander	162750 kL
156446	161 WEST RD BASSENDEAN WA 6054	
156453	Racing and Wagering Western Australia	
157042	Department of Fire and Emergency Services	
158077	Department of Education	
159502	Brighton, Anthony	
164581	120 HAZELMERE CIRCUS HAZELMERE WA 6055	
165175	Shire of Kalamunda	
167785	City of Belmont	
168263	Shire of Kalamunda	
168841	Hillview Lifestyle Village Pty Ltd	
176450	The Trustee for AB Trust & The Trustee for Coxon Developments Trust & The Trustee for Coxongroup of Companies Trust & The Trustee for MM & E Trus	
176948	130 Fauntleroy Avenue Redcliffe Pty Ltd	
177330	Andric, Ruzica	
177647	32 NARDINE CL FORRESTFIELD WA 6058	
178503	City of Swan	
179539	Metropolitan Cemeteries Board	
181758	Hussein, Emine ; Egglestone, Kevin Ray	
181973	32 NIRIMBACLOSE SOUTH GUILDFORD WA 6055	
	AECOM Australia Pty Ltd & BG&E Pty Ltd & Georgiou Group Pty Ltd & GHD Pty Ltd & Leighton Contractors Pty Limited	
	AECOM Australia Pty Ltd & BG&E Pty Ltd & Georgiou Group Pty Ltd & GHD Pty Ltd & Leighton Contractors Pty Limited	
	AECOM Australia Pty Ltd & BG&E Pty Ltd & Georgiou Group Pty Ltd & GHD Pty Ltd & Leighton Contractors Pty Limited	
	AECOM Australia Pty Ltd & BG&E Pty Ltd & Georgiou Group Pty Ltd & GHD Pty Ltd & Leighton Contractors Pty Limited	
	Leyland, Jennifer & Kenneth	
	7 EMPIRE ROSE CT DARLING DOWNS WA 6112	
	Public Transport Authority of Western Australia	
	Marwon Pty Ltd	



▼ Measurement

  |

Measurement Result
3.2 Kilometers
(Double-click to end measurement.)



Appendix C

Contaminated Sites Database Information



Contaminated Sites Act 2003 Basic Summary of Records Search Response

Report Generated at: 12:32:44PM, 06/07/2016

Search Results

This response relates to a search request received for:

13575 Abernethy Rd
Forrestfield WA 6058

This parcel belongs to a site that contains 3 parcel(s).

According to Department of Environment Regulation records, this land has been reported as a known or suspected contaminated site.

Address	13575 Abernethy Rd Forrestfield WA 6058
Lot on Plan Address	Lot 13575 On Plan 221057
Parcel Status	Classification: 04/02/2013 - Remediated for restricted use Nature and Extent of Contamination: Groundwater beneath the site is impacted by copper, zinc and total nitrogen. Despite removal of all identified asbestos-containing materials from the site in 2012, due to the site's extensive area, asbestos-containing materials may remain in soils in isolated areas of the site. Restrictions on Use: The land use of the site is restricted to commercial/industrial use with open space areas and excludes sensitive uses such as childcare centres, kindergartens, pre-schools and primary schools. The site should not be developed for a more sensitive use such residential use or childcare centres without further contamination assessment and/or remediation. In accordance with the ongoing Site Management Plan entitled "Forrestfield Grain Silo Land, Lot 13575 and Lot 500, Abernethy Road, Forrestfield, Site Management Plan" (Golder Associates Pty Ltd, November 2012), groundwater use is restricted to non-potable use which excludes irrigating plants that would be used for human consumption and there are restrictions on disturbing the on-site Conservation Category Wetland including a 50m buffer zone; specified on-site stormwater basins and drains should be retained; and management measures are to be implemented if asbestos is encountered during subsurface works.

Disclaimer

This Summary of Records has been prepared by Department of Environment Regulation (DER) as a requirement of the *Contaminated Sites Act 2003*. DER makes every effort to ensure the accuracy, currency and reliability of this information at the time it was prepared, however advises that due to the ability of contamination to potentially change in nature and extent over time, circumstances may have changed since the information was originally provided. Users must exercise their own skill and care when interpreting the information contained within this Summary of Records and, where applicable, obtain independent professional advice appropriate to their circumstances. In no event will DER, its agents or employees be held responsible for any loss or damage arising from any use of or reliance on this information. Additionally, the Summary of Records must not be reproduced or supplied to third parties except in full and unabridged form.



Contaminated Sites Act 2003

Basic Summary of Records Search Response

Report Generated at: 12:32:44PM, 06/07/2016

Reason for Classification:

This site was reported to the Department of Environment and Conservation (DEC) as per reporting obligations under section 11 of the 'Contaminated Sites Act 2003' (the Act), which commenced on 1 December 2006. The site classification is based on information submitted to DEC by January 2013.

This site was historically used as a railway yard, for approximately 30 years, from 1968 to the late 1990s. This is a land use that has the potential to cause contamination, as specified in the guideline 'Potentially Contaminating Activities, Industries and Landuses' (Department of Environment, 2004).

Several contamination assessments were carried out between 2004 and 2012 in order to comply with conditions that had been placed by the Environmental Protection Authority and Western Australian Planning Commission on the site as part of the planning approval process.

In 2009, a surface water investigation was undertaken on two on-site stormwater detection basins and an on-site wetland. The surface water investigation found no potential contaminants above Aquatic Ecosystems - Freshwater guidelines, as published in 'Assessment Levels for Soil, Sediment and Water' (Department of Environment, 2003).

A soil investigation, undertaken in April 2012, found asbestos-containing materials present in surface soils. Remedial works, comprising hand picking, raking and off-site disposal of asbestos-containing material were carried out in October 2012 and all identified asbestos-containing material were successfully removed.

The most recent groundwater monitoring, undertaken in April 2012, found copper, zinc and nitrogen in groundwater at concentrations exceeding Aquatic Ecosystems - Freshwater guidelines, as published in 'Assessment Levels for Soil, Sediment and Water' (DEC, 2010). Nitrogen levels also exceeded Irrigation Guidelines, as published in 'Assessment Levels for Soil, Sediment and Water' (DEC, 2010).

The investigations and risk assessment works were the subject of an independent review by an accredited contaminated sites auditor who provided a Mandatory Auditor's Report (MAR) dated December 2012. The MAR recommended that the site is suitable for the proposed commercial/industrial land use with possible open space areas. This recommendation assumes that the site is redeveloped in accordance with the Auditor-approved Site Management Plan (SMP). DEC accepts the findings of the MAR and management measures provided in the SMP.

As the site is contaminated and has been remediated such that it is suitable for the proposed commercial/industrial land use with possible open space areas, but may not be suitable for a more sensitive land use, the site is classified as 'remediated for restricted use'.

DEC, in consultation with the Department of Health, has classified this site based on the

Disclaimer

This Summary of Records has been prepared by Department of Environment Regulation (DER) as a requirement of the *Contaminated Sites Act 2003*. DER makes every effort to ensure the accuracy, currency and reliability of this information at the time it was prepared, however advises that due to the ability of contamination to potentially change in nature and extent over time, circumstances may have changed since the information was originally provided. Users must exercise their own skill and care when interpreting the information contained within this Summary of Records and, where applicable, obtain independent professional advice appropriate to their circumstances. In no event will DER, its agents or employees be held responsible for any loss or damage arising from any use of or reliance on this information. Additionally, the Summary of Records must not be reproduced or supplied to third parties except in full and unabridged form.



Contaminated Sites Act 2003 Basic Summary of Records Search Response

Report Generated at: 12:32:44PM, 06/07/2016

Certificate of Title Memorial
Current Regulatory Notice Issued
General

information available to DEC at the time of classification. It is acknowledged that the contamination status of the site may have changed since the information was collated and/or submitted to DEC, and as such, the usefulness of this information may be limited.

In accordance with Department of Health advice, if groundwater is being, or is proposed to be abstracted, DEC recommends that analytical testing should be carried out to determine whether the groundwater is suitable for its intended use.

Action Required:

The Auditor-approved SMP entitled "Forrestfield Grain Silo Land, Lot 13575 and Lot 500, Abernethy Road, Forrestfield, Site Management Plan" (Golder Associates Pty Ltd, November 2012) provides site-specific management measures such as actions required if asbestos is encountered during future subsurface works; details on-going groundwater monitoring; restrictions of groundwater for potable use or irrigating plants that would be used for human consumption; restrictions for disturbing the on-site Conservation Category Wetland including a 50m buffer zone; and the retainment of the on-site stormwater basins and drains. These management measures will need to be complied with during future redevelopment works.

Under the Contaminated Sites Act 2003, this site has been classified "remediated for restricted use". For further information on the contamination status of this site, please contact the Contaminated Sites Branch of the Department of Environment & Conservation.

Type of Regulatory Notice: Nil

Date Issued: Nil

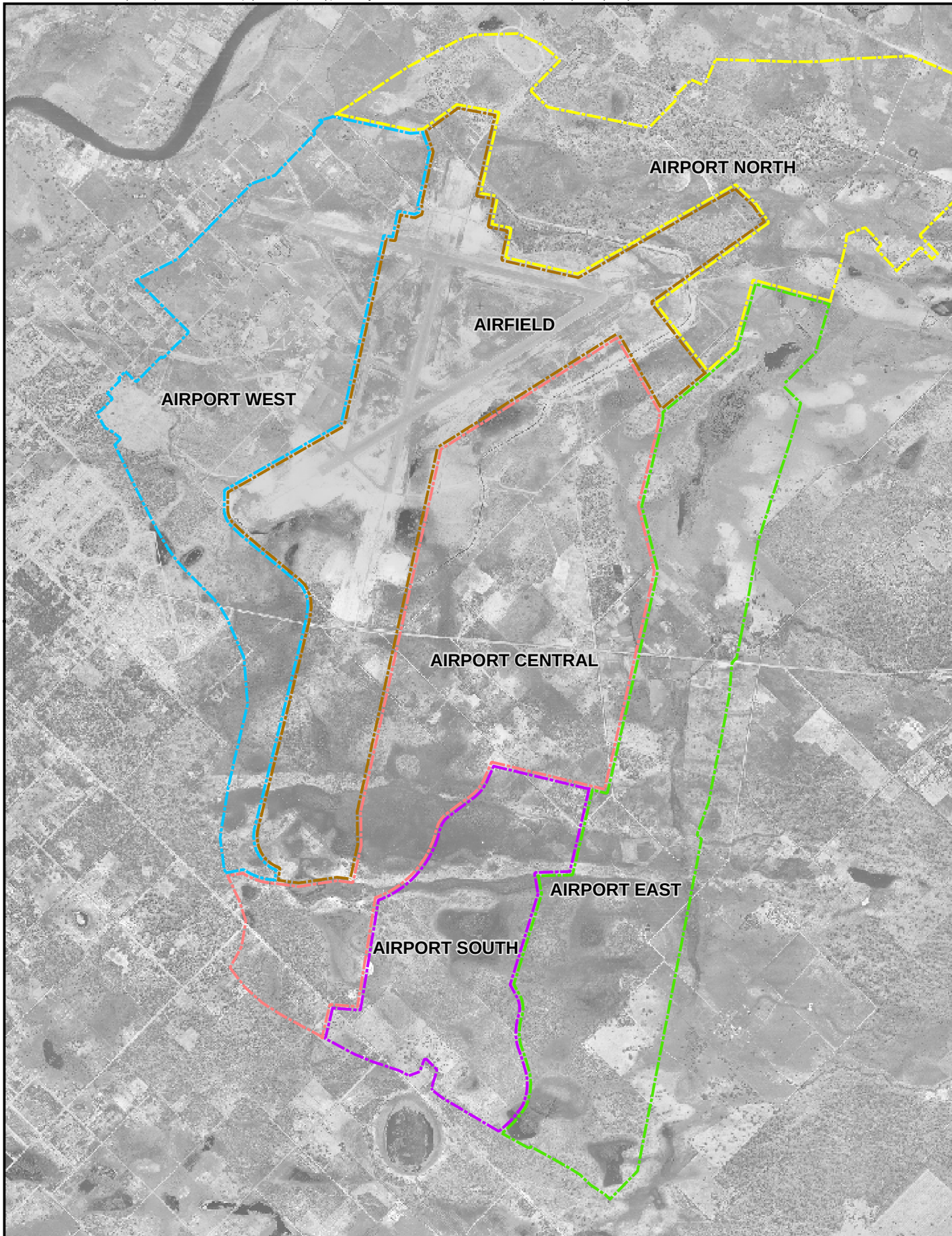
No other information relating to this parcel.

Disclaimer

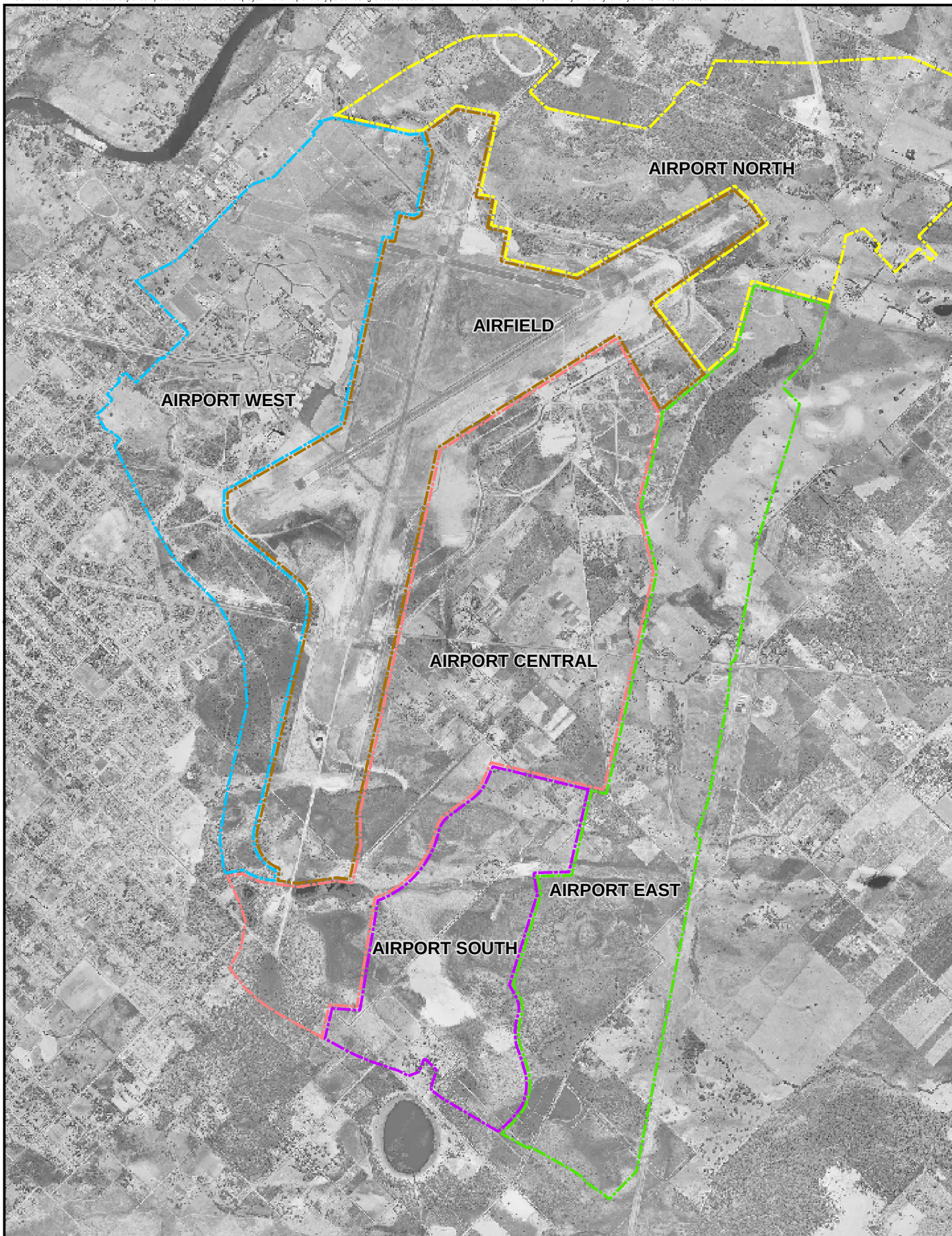
This Summary of Records has been prepared by Department of Environment Regulation (DER) as a requirement of the *Contaminated Sites Act 2003*. DER makes every effort to ensure the accuracy, currency and reliability of this information at the time it was prepared, however advises that due to the ability of contamination to potentially change in nature and extent over time, circumstances may have changed since the information was originally provided. Users must exercise their own skill and care when interpreting the information contained within this Summary of Records and, where applicable, obtain independent professional advice appropriate to their circumstances. In no event will DER, its agents or employees be held responsible for any loss or damage arising from any use of or reliance on this information. Additionally, the Summary of Records must not be reproduced or supplied to third parties except in full and unabridged form.

Appendix D

Historical Aerial Photographs



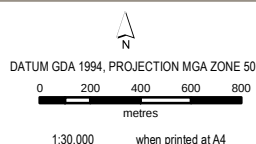
PROJECT ID 60509115 CREATED BY [redacted] APPROVED BY MOR/PA LAST MODIFIED 16 FEB 2017 AECOM www.aecom.com DATUM GDA 1994, PROJECTION MGA ZONE 50 0 200 400 600 800 metres 1:30,000 when printed at A4	LEGEND Zones - Airfield - Airport Central - Airport East - Airport North - Airport South - Airport West Data sources: Landscape Imagery Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).	Historical Aerial 27/11/1953 AIRSERVICES AUSTRALIA PRELIMINARY SITE INVESTIGATION AT PERTH AIRPORT Appendix D-1
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PROJECT ID 60509115
 CREATED BY [Redacted]
 APPROVED BY MOR/PA
 LAST MODIFIED 16 FEB 2017



www.aecom.com



LEGEND
Zones
 Airfield
 Airport Central
 Airport East
 Airport North
 Airport South
 Airport West

Data sources:
 Landgate Imagery
 Base Data: (c) Based on information provided by and
 with the permission of the Western Australian Land
 Information Authority trading as Landgate (2010).

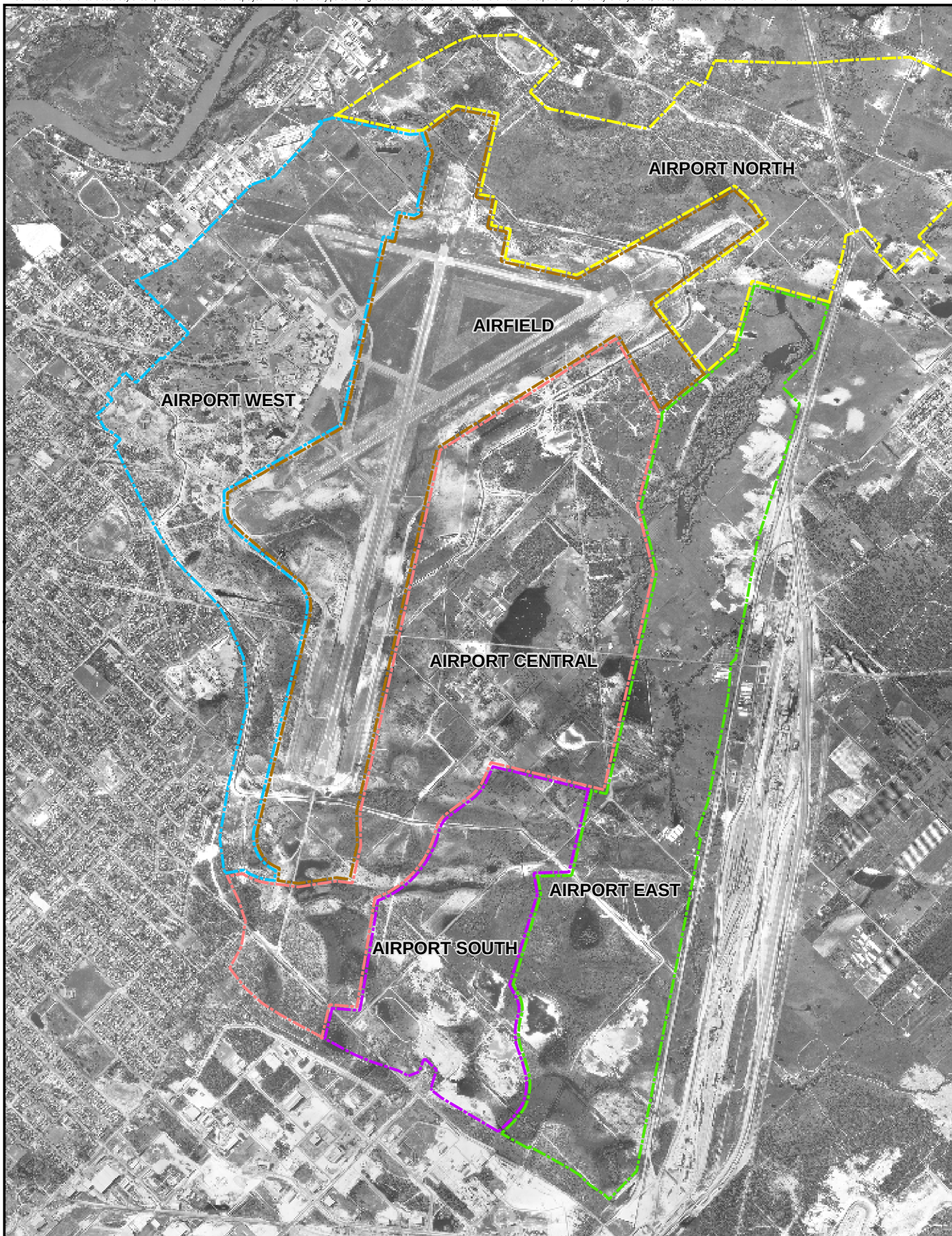
Historical Aerial
11/03/1965

AIRSERVICES AUSTRALIA

PRELIMINARY SITE INVESTIGATION
AT PERTH AIRPORT

Appendix

D-2



PROJECT ID 60509115
 CREATED BY [Redacted]
 APPROVED BY MOR/PA
 LAST MODIFIED 16 FEB 2017

AECOM
 www.aecom.com

DATUM GDA 1994, PROJECTION MGA ZONE 50

0 200 400 600 800
 metres

1:30,000 when printed at A4

- LEGEND**
- Zones**
- Airport West
 - Airport Central
 - Airport East
 - Airport South
 - Airport North
 - Airfield

Data sources:
 Landgate Imagery
 Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).

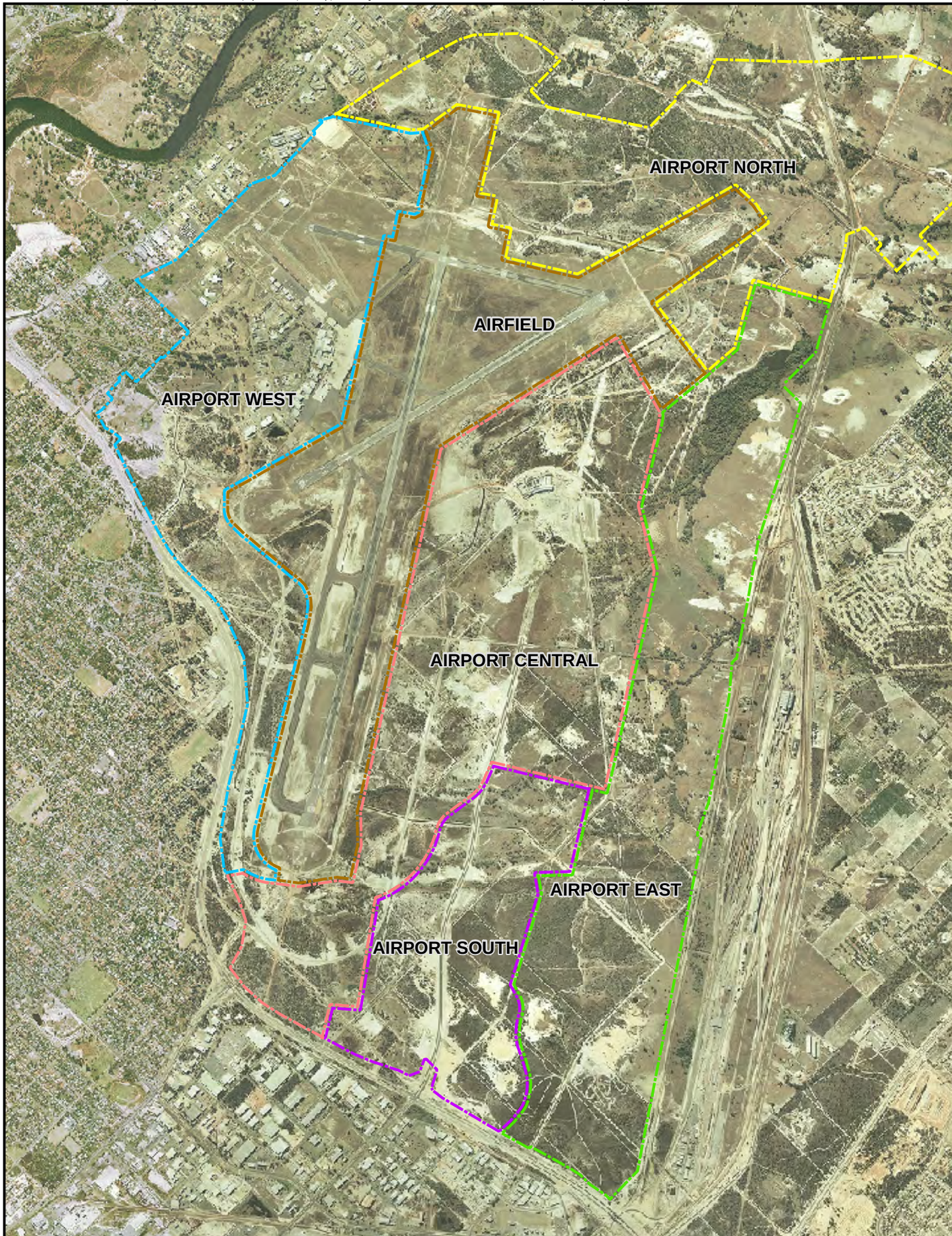
Historical Aerial
06/09/1974

AIRSERVICES AUSTRALIA

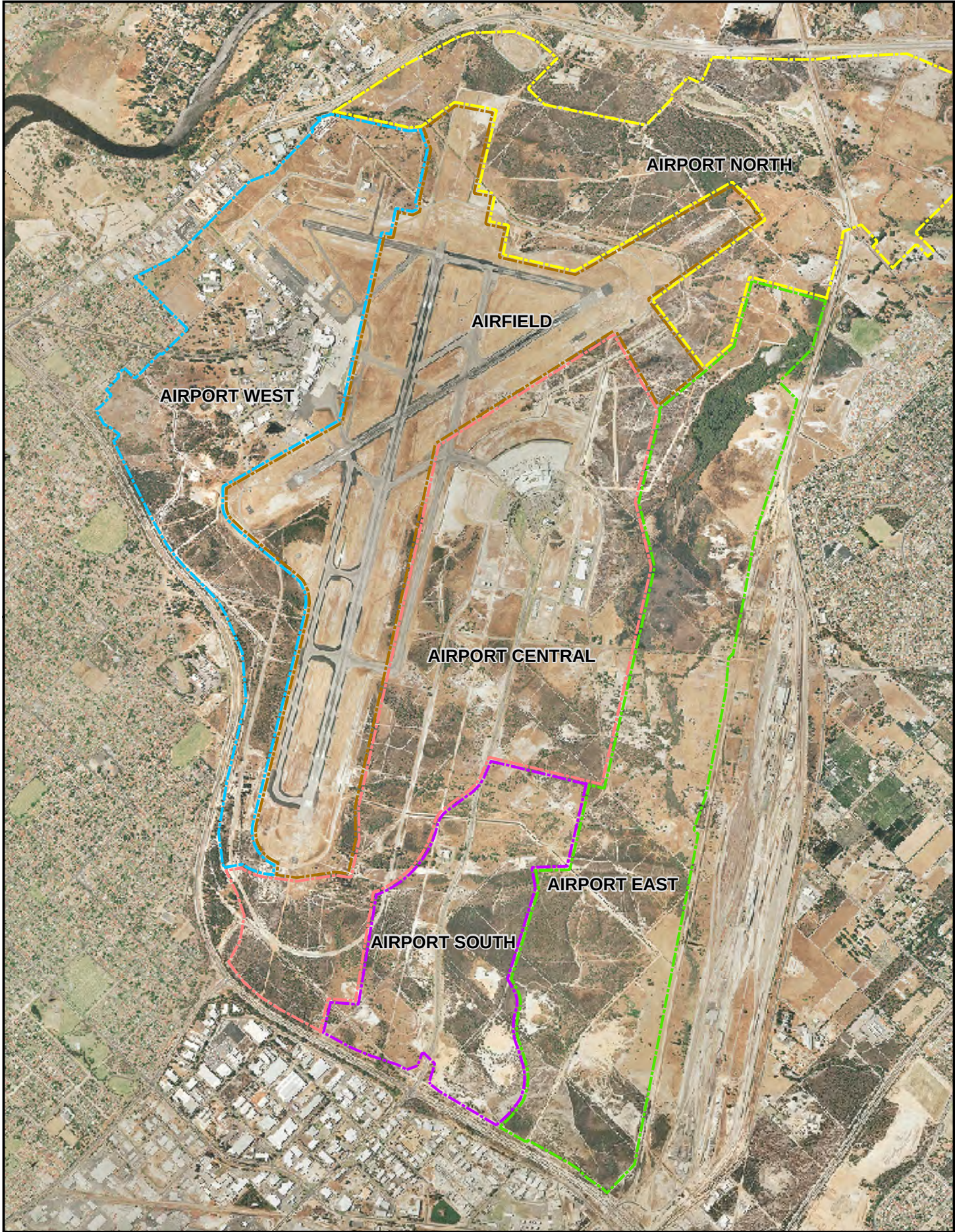
PRELIMINARY SITE INVESTIGATION
AT PERTH AIRPORT

Appendix

D-3



PROJECT ID 60509115 CREATED BY [Redacted] APPROVED BY MOR/PA LAST MODIFIED 16 FEB 2017 AECOM www.aecom.com DATUM GDA 1994, PROJECTION MGA ZONE 50 0 200 400 600 800 metres 1:30,000 when printed at A4	LEGEND Zones - Airfield - Airport Central - Airport East - Airport North - Airport South - Airport West Data sources: Landgate Imagery Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).	Historical Aerial 14/6/1985 AIRSERVICES AUSTRALIA PRELIMINARY SITE INVESTIGATION AT PERTH AIRPORT Appendix D-4
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PROJECT ID 60509115
CREATED BY [redacted]
APPROVED BY MOR/PA
LAST MODIFIED 16 FEB 2017

www.aecom.com

DATUM GDA 1994, PROJECTION MGA ZONE 50
0 200 400 600 800
metres
1:30,000 when printed at A4

LEGEND
Zones
[yellow dashed line] Airfield
[orange dashed line] Airport Central
[green dashed line] Airport East
[purple dashed line] Airport South
[blue dashed line] Airport West

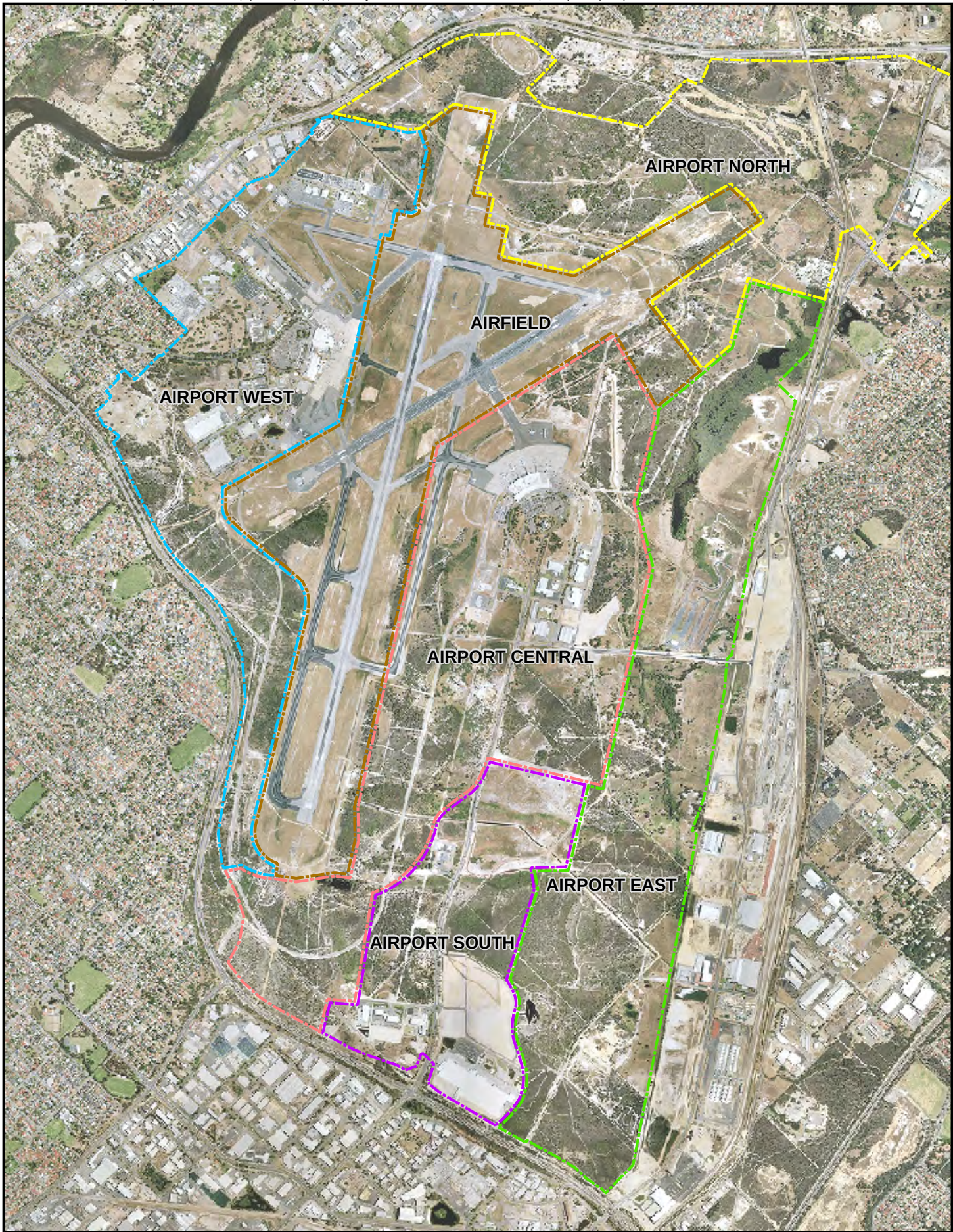
Data sources:
Landgate Imagery
Base Data: (c) Based on information provided by and
with the permission of the Western Australian Land
Information Authority trading as Landgate (2010).

Historical Aerial
06/02/1995

AIRSERVICES AUSTRALIA

PRELIMINARY SITE INVESTIGATION
AT PERTH AIRPORT

Appendix
D-5



PROJECT ID 60509115
CREATED BY [Logo]
APPROVED BY MOR/PA
LAST MODIFIED 16 FEB 2017

AECOM
www.aecom.com

DATUM GDA 1994, PROJECTION MGA ZONE 50

0 200 400 600 800

metres

1:30,000 when printed at A4

LEGEND
Zones

Airfield

Airport Central

Airport East

Airport North

Airport South

Airport West

Data sources:
Landgate Imagery
Base Data: (c) Based on information provided by and
with the permission of the Western Australian Land
Information Authority trading as Landgate (2010).

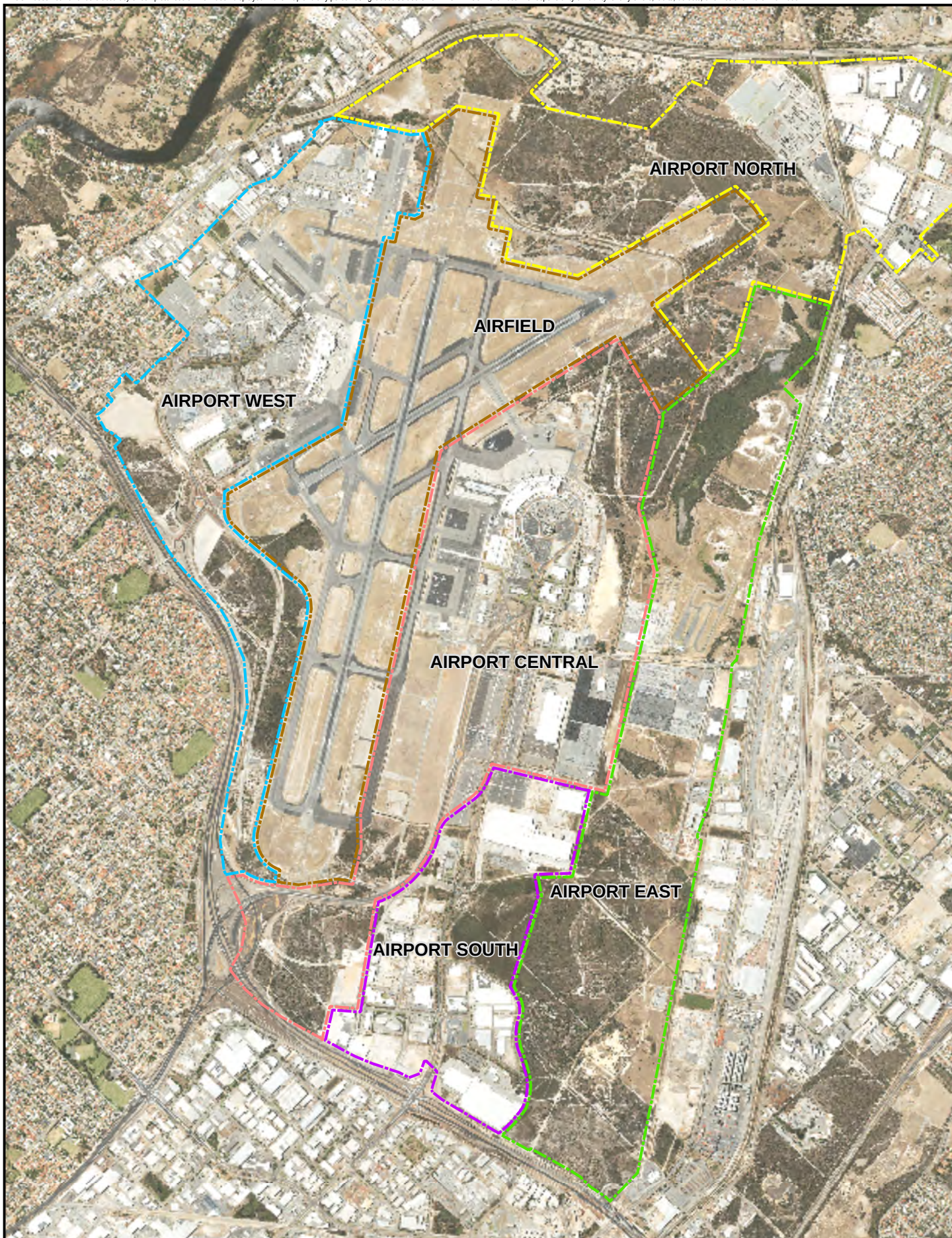
Historical Aerial
07/05/2006

AIRSERVICES AUSTRALIA

PRELIMINARY SITE INVESTIGATION
AT PERTH AIRPORT

Appendix

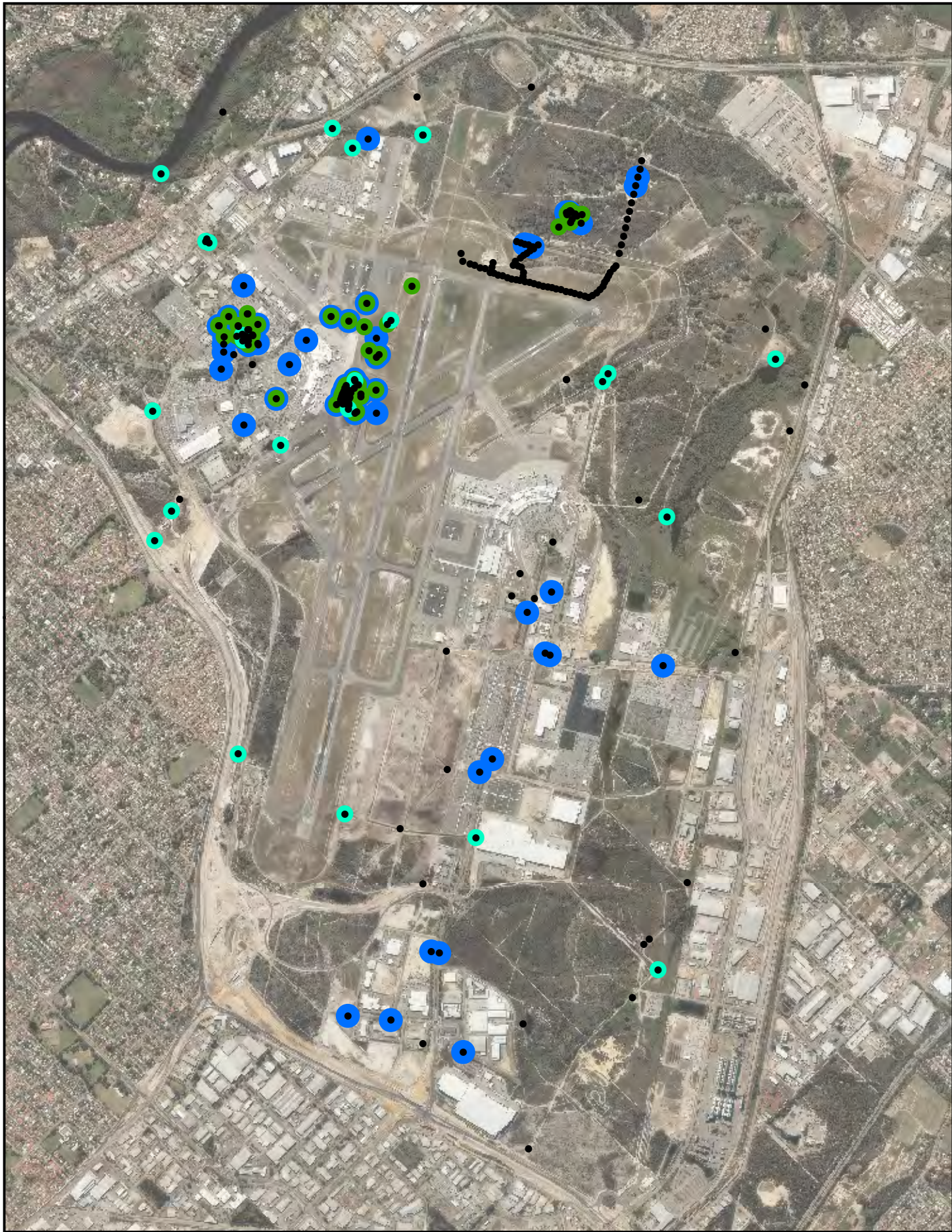
D-6



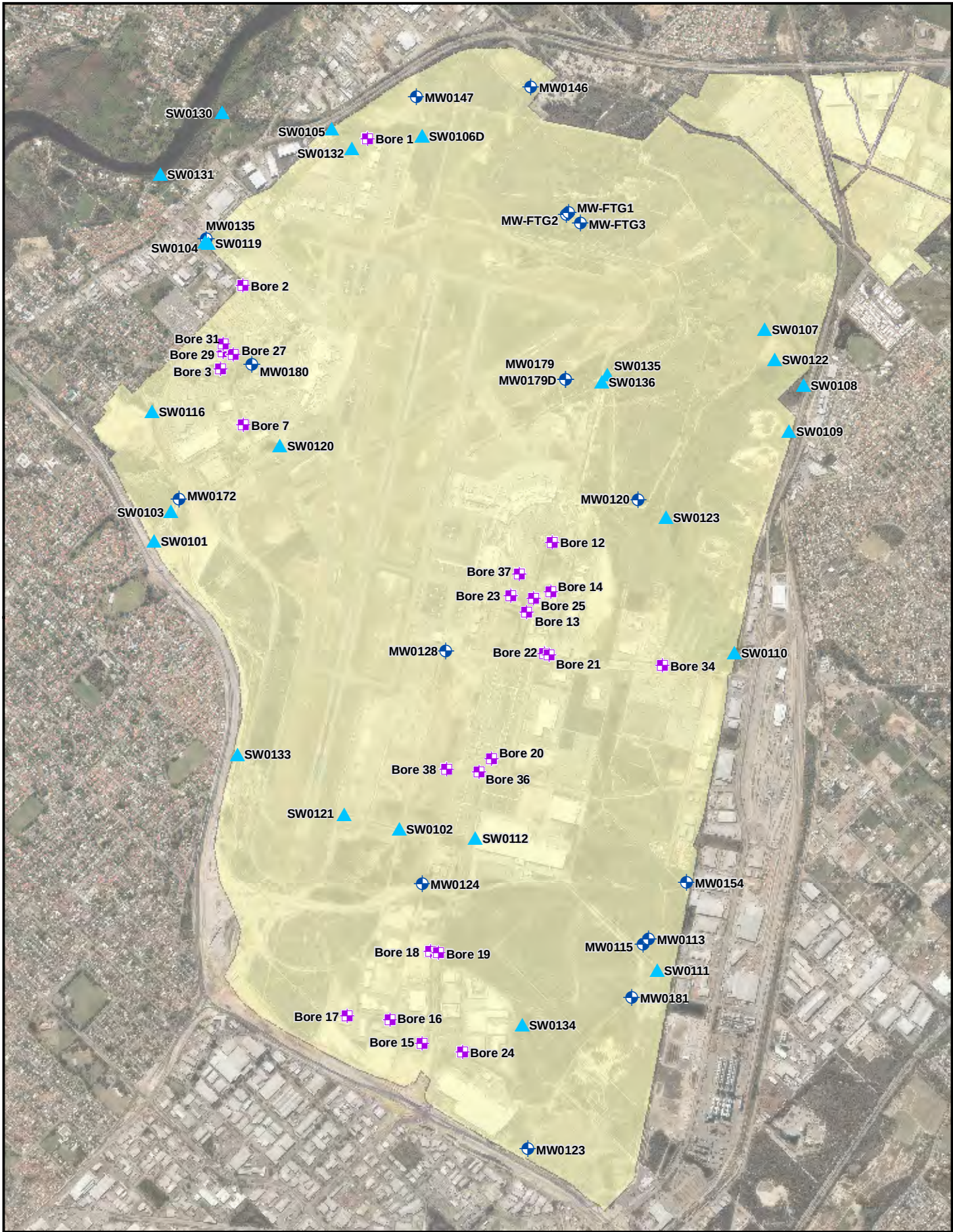
PROJECT ID 60509115 CREATED BY [redacted] APPROVED BY MOR/PA LAST MODIFIED 16 FEB 2017 AECOM www.aecom.com DATUM GDA 1994, PROJECTION MGA ZONE 50 0 200 400 600 800 metres 1:30,000 when printed at A4	LEGEND Zones --- Airport North --- Airport Central --- Airport East --- Airport South --- Airport West Data sources: Landgate Imagery Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).	Historical Aerial 26/02/2016 AIRSERVICES AUSTRALIA PRELIMINARY SITE INVESTIGATION AT PERTH AIRPORT Appendix D-7
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Appendix E

Summary of Historical
PFAS Detection and
Current Sampling
Locations



PROJECT ID 60509115 CREATED BY [redacted] APPROVED BY MOR LAST MODIFIED 12 AUG 2016 AECOM www.aecom.com DATUM GDA 1994, PROJECTION MGA ZONE 50 0 200 400 600 800 metres 1:30,000 when printed at A4	LEGEND ● Sampling Locations ● PFOS or PFOA Detected in Soil ● PFOS or PFOA Detected in Surface Water ● PFOS or PFOA Detected in Groundwater	Note: Reticulation Bore 35 not shown as no location information available. PFOS/PFOA above LOR at this location. Data sources: Landgate Imagery (Feb. 2016) Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).	Historical PFOS and PFOA Impacts in Soil and Groundwater AIRSERVICES AUSTRALIA PRELIMINARY SITE INVESTIGATION, SERVICES FOR AVIATION RESCUE FIRE FIGHTING (ARFF) FACILITIES AT PERTH AIRPORT Appendix F-1
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PROJECT ID 60509115
CREATED BY MOR
APPROVED BY MOR
LAST MODIFIED 12 AUG 2016

www.aecom.com

N

DATUM GDA 1994, PROJECTION MGA ZONE 50

0 200 400 600 800
metres

1:30,000 when printed at A4

Bore

Monitoring Well

Sampled Surface Water Sample Location

Perth Airport Estate

Data sources:
Landgate Imagery (Feb. 2016)
Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).

Airport Monitoring Locations

AIRSERVICES AUSTRALIA

PRELIMINARY SITE INVESTIGATION,
SERVICES FOR AVIATION RESCUE
FIRE FIGHTING (ARFF) FACILITIES AT
PERTH AIRPORT

Appendix

F-2

Appendix F

Incident Reports

ARFF Incident Detail Report

Air Services Australia

PERTH

Incident No:

219

ARFF Incident Details for Fuel Spillage

02/01/1998**Incident Site:** BAY 51 ITA SAA 747 SP**Number of Lives Saved:** 0**Origin of Call:** Fire Line**Number of Deaths:** 0**Company:****Number of Injuries:** 0**Est Damage Value:** \$0**Est Facility Value:** \$0

Incident Times (UTC)

Call Time: 02/01/1998 16:16:29**Arrival Time:** 02/01/1998 16:19:57**End Time:** 02/01/1998 17:57:57**Dispatch Time:** 02/01/1998 16:16:32**Control Time:** 02/01/1998 17:57:57**Return Time:** 02/01/1998 17:59:40

Materials Used

DCP Used: 0.00 kg**Foam Used:** 150 litres**WaterUsed:** 2500 litres**Other Used:**

Vehicles Involved

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
ULFV 6	1	ULFV 5	1		

Staff in Attendance

Team Leader:**FSM:****Other Staff:**

Actions Taken

280 L of Avtur spilled from SAA 747 SP on Bay 51 ITB areaAcft.call sign SA 281 - ZPB. The approximate area was 560 sq meters. The safety officer put five soaker booms down to dam the fuel and RFFS applied a foam blanket for safety while other aircraft were moving in the area.

ARFF Incident Detail Report

Air Services Australia

PERTH

Incident No:

541

ARFF Incident Details for Fuel Spillage**29/08/1998****Incident Site:** BAY 17 ANSETT TERMINAL**Number of Lives Saved:** 0**Origin of Call:** PABX**Number of Deaths:** 0**Company:****Number of Injuries:** 0**Est Damage Value:** \$0**Est Facility Value:** \$0**Incident Times (UTC)****Call Time:** 29/08/1998 01:35:07**Arrival Time:** 29/08/1998 01:39:38**End Time:** 29/08/1998 02:42:33**Dispatch Time:** 29/08/1998 01:37:58**Control Time:** 29/08/1998 02:42:33**Return Time:** 29/08/1998 02:42:35**Materials Used****DCP Used:** 0.00 kg**Foam Used:** 40 litres**WaterUsed:** 19500 litres**Other Used:****Vehicles Involved**

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
ULFV 6	1	ULFV 5	1		

Staff in Attendance**Team Leader:****FSM:****Other Staff:****Actions Taken**

FUEL SPILL FROM PORT WING VENT. APPROXIMATELY 250 LITRES SPILT. ALL REFUELING AND LOADING WAS STOPPED UNTIL A FOAM BLANKET WAS APPLIED TO THE SPILL. LIMITED OPERATIONS WERE PERMITTED DURING THE CLEAN UP OPERATIONS.

ARFF Incident Detail Report

Air Services Australia

PERTH

Incident No:

803

ARFF Incident Details for Fuel Spillage

23/02/1999

Incident Site:	BAY 52	Number of Lives Saved:	0
Origin of Call:	Safety Officer	Number of Deaths:	0
Company:		Number of Injuries:	0
Est Damage Value:	\$0	Est Facility Value:	\$0

Incident Times (UTC)

Call Time:	23/02/1999 08:28:00	Arrival Time:	23/02/1999 08:32:00	End Time:	23/02/1999 08:39:00
Dispatch Time:	23/02/1999 08:28:00	Control Time:	23/02/1999 08:39:00	Return Time:	23/02/1999 08:50:00

Materials Used

DCP Used:	0.00 kg	Foam Used:	88 litres
WaterUsed:	530 litres	Other Used:	

Vehicles Involved

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
ULFV 5	1				

Staff in Attendance

Team Leader: FSM:

Other Staff:

Actions Taken

38 LITRES OF UNLEADED FUEL LEAKED FROM AN ANSETT TUG BEING DRIVEN BY ANSETT LOADER [REDACTED]. ON ARRIVAL OF RFFS WAC SAFETY OFFICER [REDACTED] INFORMED US THAT AFTER SPILLING THE FUEL [REDACTED] TRIED TO WASH IT AWAY WITH WATER. THIS CARRIED THE FUEL DOWN BETWEEN A BRITISH AIRWAYS 747 WHICH WAS BEING REFUELLED ON BAY 52 AND A MALAYSIA 777 WHICH WAS BEING PUSHED BACK FROM BAY 53. RFFS COVERED THE ENTIRE FUEL/WATER MIXTURE WITH FOAM AND STOOD BY. BP REFUELLER [REDACTED] SAID THAT AN ANSETT TRUCK WHICH HAD BEEN PARKED NEXT TO THE TUG DROVE OFF AND TURNED SHARPLY DAMAGING THE TUG FUEL TANK. HE ALSO STATED THAT GROUND VEHICLES HAD BEEN DRIVEN THROUGH THE FUEL/WATER SPILLAGE. THE AREA SHOULD HAVE BEEN CORDONED OFF ALL VEHICLES NEARBY SHUT DOWN AND RFFS AND SAFETY OFFICER CALLED IMMEDIATELY.

ARFF Incident Detail Report

Air Services Australia

PERTH

Incident No:

1491

ARFF Incident Details for

Aircraft - ABLDG

07/09/2000

Incident Site: R/W 21

Number of Lives Saved: 0

Origin of Call: IC from Tower

Number of Deaths: 0

Company:

Number of Injuries: 0

Est Damage Value: \$0

Est Facility Value: \$0

Incident Times (UTC)

Call Time: 07/09/2000 23:23:00

Arrival Time: 07/09/2000 23:59:00

End Time: 07/09/2000 00:10:00

Dispatch Time: 07/09/2000 23:58:00

Control Time: 07/09/2000 00:10:00

Return Time: 07/09/2000 00:12:00

Materials Used

DCP Used: 0.00 kg

Foam Used: 46 litres

WaterUsed: 367 litres

Other Used: 0 0 0

Vehicles Involved

Vehicle Code

Quantity

Vehicle Code

Quantity

Vehicle Code

Quantity

ULFV 6

1

ULFV 5

2

Staff in Attendance

Team Leader:

FSM:

Other Staff:

Actions Taken

ULFV No 1/2/3 TURNED OUT TO STANDBY POSITIONS RUNWAY 21. AIRCRAFT LANDED SAFELY. ULFV No 1/3 RETURNED TO STATION. ULFV No 2 FOLLOWED AIRCRAFT TO SKIPPERS HANGAR THEN RETURNED TO STATION.

ARFF Incident Detail Report

Air Services Australia

PERTH

Incident No:

1552

ARFF Incident Details for **Fire Alarm****07/10/2000**

Incident Site: SKIPPERS AVIATION

Number of Lives Saved: 0

Origin of Call:

Number of Deaths: 0

Company:

Number of Injuries: 0

Est Damage Value: \$0

Est Facility Value: \$0

Incident Times (UTC)

Call Time: 07/10/2000 17:15:00

Arrival Time: 07/10/2000 17:21:00

End Time: 07/10/2000 20:37:00

Dispatch Time: 07/10/2000 17:15:00

Control Time: 07/10/2000 20:37:00

Return Time: 07/10/2000 20:37:00

Materials Used

DCP Used: 0.00 kg

Foam Used: 30 litres

WaterUsed: 200 litres

Other Used:

Vehicles Involved

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
ULFV 6	1				

Staff in Attendance

Team Leader:

FSM:

Other Staff:

Actions Taken

FIP INDICATED HANGAR 2 SIP IN ALARM. HANGAR 2 SIP ZONE 3 VESDA ACTIVATED.STRONG SMELL OF AVTUR THROUGHOUT HANGAR HOUSING 2 DASH 8AIRCRAFT. MAINTENANCE WAS BEING CARRIED OUT ON ONE AIRCRAFT AND FUEL WASOBSERVED RUNNING DOWN THE SIDE FROM THE PORT WING ROOT AND HAD POOLEDUNDER THE AIRCRAFT.ARFFS COVERED THE FUEL WITH FOAM AND VENTILATED THEHANGAR.ARFFS STOOD BY UNTIL MAINTENANCE ENGINEERS ARRIVED.

ARFF Incident Detail Report

Air Services Australia

PERTH

Incident No:

1615

ARFF Incident Details for Fuel Spillage

15/11/2000**Incident Site:** ITB BAY 54 - SOUTH AFRICA ZS-SAL**Number of Lives Saved:** 0**Origin of Call:** PABX**Number of Deaths:** 0**Company:** [REDACTED]**Number of Injuries:** 0**Est Damage Value:** \$0**Est Facility Value:** \$0

Incident Times (UTC)

Call Time: 15/11/2000 16:02:00**Arrival Time:** 15/11/2000 16:06:00**End Time:** 15/11/2000 17:30:00**Dispatch Time:** 15/11/2000 16:03:00**Control Time:** 15/11/2000 17:30:00**Return Time:** 15/11/2000 18:18:00

Materials Used

DCP Used: 0.00 kg**Foam Used:** 150 litres**WaterUsed:** 20000 litres**Other Used:**

Vehicles Involved

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
ULFV 6	1	ULFV 5	2		

Staff in Attendance

Team Leader:**FSM:****Other Staff:**

Actions Taken

Fuel vented from port wing during refueling operations. Due to size of spill and local conditions ARFF initially applied a foam blanket to spill area. Fuelling operations and boarding of passengers were suspended. Transit passengers on board were also disembarked. Second vehicle arrived to assist @ 16:14:00 UTC. Foam and fuel residue was washed away using handlines and vehicle monitors. Due to vehicle operating problems T3 was turned out to attend whilst T4 returned to fire station to be changed with T2. ARFF operation were suspended @ 1812 all vehicles returned to fire station.

ARFF Incident Detail Report

Air Services Australia

PERTH

Incident No:

1831

ARFF Incident Details for **Fire Non-Aircraft**

20/03/2001

Incident Site: AUST. CORRECTIONS BLDG.
(DETENTION CENTRE)

Number of Lives Saved: 0

Origin of Call:

Number of Deaths: 0

Company:

Number of Injuries: 0

Est Damage Value: \$0

Est Facility Value: \$0

Incident Times (UTC)

Call Time: 20/03/2001 17:18:00	Arrival Time: 20/03/2001 17:22:00	End Time: 20/03/2001 17:27:00
Dispatch Time: 20/03/2001 17:18:30	Control Time: 20/03/2001 17:27:00	Return Time: 20/03/2001 17:32:00

Materials Used

DCP Used: 0.00 kg

Foam Used: 10 litres

WaterUsed: litres

Other Used:

Vehicles Involved

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
ULFV 6	1				

Staff in Attendance

Team Leader:

FSM:

Other Staff:

Actions Taken

FIRE IN RUBBISH BIN EXTINGUISHED WITH WATER THROUGH H.R.

ARFF Incident Detail Report

Air Services Australia

PERTH

Incident No:

1832

ARFF Incident Details for **Fire Non-Aircraft****20/03/2001****Incident Site:** AUST. CORRECTIONS BLDG.
(DETENTION CENTRE)**Number of Lives Saved:** 0**Origin of Call:****Number of Deaths:** 0**Company:****Number of Injuries:** 0**Est Damage Value:** \$0**Est Facility Value:** \$0

Incident Times (UTC)

Call Time: 20/03/2001 19:08:00 **Arrival Time:** 20/03/2001 19:12:00 **End Time:** 20/03/2001 19:17:00**Dispatch Time:** 20/03/2001 19:08:30 **Control Time:** 20/03/2001 19:17:00 **Return Time:** 20/03/2001 19:21:00

Materials Used

DCP Used: 0.00 kg**Foam Used:** 9 litres**WaterUsed:** litres**Other Used:**

Vehicles Involved

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
ULFV 6	1				

Staff in Attendance

Team Leader:**FSM:****Other Staff:**

Actions Taken

FIRE IN BIN STARTED BY DETAINEE EXTINGUISHED WITH WATER THROUGH H.R.

ARFF Incident Detail Report

Air Services Australia

PERTH

Incident No:

1965

ARFF Incident Details for Fuel Spillage

16/07/2001**Incident Site:** BAY 54 ITB - SAA ZS-SAT**Number of Lives Saved:** 0**Origin of Call:** Safety Officer**Number of Deaths:** 0**Company:****Number of Injuries:** 0**Est Damage Value:** \$0**Est Facility Value:** \$0

Incident Times (UTC)

Call Time: 16/07/2001 03:27:00**Arrival Time:** 16/07/2001 03:31:00**End Time:** 16/07/2001 05:28:00**Dispatch Time:** 16/07/2001 03:27:00**Control Time:** 16/07/2001 05:28:00**Return Time:** 16/07/2001 05:52:00

Materials Used

DCP Used: 0.00 kg**Foam Used:** 200 litres**WaterUsed:** 16000 litres**Other Used:**

Vehicles Involved

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
ULFV 6	1				

Staff in Attendance

Team Leader:**FSM:****Other Staff:**

Actions Taken

SAA ZS-SAT vented approx. 100 litres of AVTUR from port wing. ARFF covered spill with foam and stood by until aircraft departed. After consultation with WAC environmental officers ARFF washed way residue with monitor.

ARFF Incident Detail Report

Air Services Australia

PERTH

Incident No:

2193

ARFF Incident Details for **Fuel Spillage****23/01/2002**

Incident Site: ANSETT TERMINAL PUBLIC CAR PARK

Number of Lives Saved: 0

Origin of Call:

Number of Deaths: 0

Company:

Number of Injuries: 0

Est Damage Value: \$0

Est Facility Value: \$0

Incident Times (UTC)

Call Time: 23/01/2002 02:54:00

Arrival Time: 23/01/2002 02:57:00

End Time: 23/01/2002 03:42:00

Dispatch Time: 23/01/2002 02:54:00

Control Time: 23/01/2002 03:42:00

Return Time: 23/01/2002 03:49:00

Materials Used

DCP Used: 0.00 kg

Foam Used: 50 litres

WaterUsed: 100 litres

Other Used: DENSO PUTTY

Vehicles Involved

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
ULFV 5	1				

Staff in Attendance

Team Leader:

FSM:

Other Staff:

Actions Taken

applied foam to fuel spill on ground.Bunded drain to prevent fuel entering.Plugged hole in tank with denso putty to stop leak and moved vehicle into a position away from other vehicles.Once we had confirmed leak had stopped we handed the vehicle over to the owner and advised to take it to a mechanic to be repaired immediately.Remaining fuel was washed down as advised by airport EPA.Vehicle owned by [REDACTED] from country line marking [REDACTED]

ARFF Incident Detail Report

Air Services Australia

PERTH

Incident No:

3372

ARFF Incident Details for Fire Non-Aircraft**23/07/2004****Incident Site:** OFF AIRPORT**Number of Lives Saved:** 0**Origin of Call:** IC from Tower**Number of Deaths:** 0**Company:****Number of Injuries:** 0**Est Damage Value:** \$5000000**Est Facility Value:** \$3000000**Incident Times (UTC)****Call Time:** 23/07/2004 00:55:00**Arrival Time:** 23/07/2004 01:01:00**End Time:** 23/07/2004 01:57:00**Dispatch Time:** 23/07/2004 00:55:00**Control Time:** 23/07/2004 01:56:00**Return Time:** 23/07/2004 02:08:00**Materials Used****DCP Used:** 0.00 kg**Foam Used:** 100 litres**WaterUsed:** 3000 litres**Other Used:****Vehicles Involved**

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
ULFV 6	1	Police	1	Ambulance	1
MFB	1				

Staff in Attendance**Team Leader:****FSM:****Other Staff:****Actions Taken**

Landside

16oC S @7Kmh

ATC advised ARFF of thick black , estimated to be Gt eastern hwy, which borders airport North end.

ARFF responded under lights / sirens.

WESTRAC industrial facility workshop on fire.

0101 - ARFF arrived behind FESA 1st - Midland.1 pumper/1 light tanker

Fire warden / supervisor advised staff evacuated, but not yet accounted for all staff.

0109 - Possibility of life at risk

Wardens advised facility had a Haulpack tip truck inside

Facility was a paint shop..

Facility dimensions - 50m L / 25m W / 15m H

Power confirmed isolated / reposition tenders / sectorise - About this time advised all staff accounted for

0118 - FESA enter south end,

ARFF enter (SCBA) North end.

FESA 2nd enter same time. FESA extinguish roof, provide exposure protection

0126 - FESA replenish T1

0135 - ARFF extinguished tyre fires / hydraulics etc

0156 - Cntrol / ARFF SCBA crew out

0157 - ARFF make up

0218 - ARFF return

ARFF Incident Detail Report

Air Services Australia

PERTH

Incident No:

3585

ARFF Incident Details for MVA**08/12/2004**

Incident Site:	DTB carpark	Number of Lives Saved:	0
Origin of Call:		Number of Deaths:	0
Company:	Private Citizen	Number of Injuries:	1
Est Damage Value:	\$0	Est Facility Value:	\$0

Incident Times (UTC)

Call Time:	08/12/2004 22:21:27	Arrival Time:	08/12/2004 22:15:00	End Time:	08/12/2004 23:27:00
Dispatch Time:	08/12/2004 22:10:00	Control Time:	08/12/2004 22:21:00	Return Time:	08/12/2004 23:31:00

Materials Used

DCP Used:	0.00 kg	Foam Used:	40 litres
WaterUsed:	600 litres	Other Used:	

Vehicles Involved

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
ULFV 6	1	Ambulance	1	Other	2
Airport Safety	1				

Staff in Attendance**Team Leader:** [REDACTED] **FSM:****Other Staff:****Actions Taken**

Landside.

ARFF attended to MVA involving 4 vehicles in DTB carpark.
(Grey Toyota Utiity 1BUW 069 driven by [REDACTED] in company with her daughter [REDACTED] as passenger both of 5 Elton Street,Maddington.

Red Alfa Romeo Stn Sdn GEOCOM1 driven by [REDACTED] in company with her young son as passenger both of 25 Sandpiper Street, Sorrento.)

Both drivers and passengers had alighted from their damaged vehicles.

The two above stated vehicles collided then cannoned into 2 stationary unattended vehicles in the carpark.
(White Holden Commodore Stn Sdn [REDACTED] Maroon Holden Commodore Sdn [REDACTED].)

ARFF administered first aid ([REDACTED]) to [REDACTED] who advised that her neck was sore. [REDACTED] was transported to RPH by St John Ambulance for further treatment.

ARFF covered hydraulic oil, fuel and radiator fluid spill from vehicles with water/AFFF.

The 2 driven vehicles were removed from the scene by nominated towing contractors. The 2 damaged stationary vehicles were left in situ under the control of WAC awaiting the return of their owners. ARFF found no fluid leaks from the stationary vehicles.

WAC safety officer placed slixit on spill after the removal of the two driven vehicles and ARFF washed spill using water.

ARFF Incident Detail Report

Air Services Australia

PERTH

Incident No:

4163

ARFF Incident Details for Fuel Spillage

07/01/2006

Incident Site: Bay 55 VH-EBY

Number of Lives Saved: 0

Origin of Call: Fire Line

Number of Deaths: 0

Company:

Number of Injuries: 0

Est Damage Value: \$0

Est Facility Value: \$0

Incident Times (UTC)

Call Time: 07/01/2006 05:35:00

Arrival Time: 07/01/2006 05:37:00

End Time: 07/01/2006 09:09:00

Dispatch Time: 07/01/2006 05:35:00

Control Time: 07/01/2006 09:09:00

Return Time: 07/01/2006 09:14:00

Materials Used

DCP Used: 0.00 kg

Foam Used: 10 litres

WaterUsed: 200 litres

Other Used:

Vehicles Involved

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
Airport Safety	2	ULFV 8	2		

Staff in Attendance

Team Leader:

FSM:

Other Staff:

Actions Taken

Airside

05:35:00 ARFF responded to a direct line call from WAC airport control centre to a fuel spill, bay 55, Qantas 747 300 VH-EBY, Avtur venting from starboard wing.

05:37:00 ARFF arrived and took up position on outer starboard wing.

One line deployed with FB10X as precaution, 2 safety officers in attendance had already applied material to soak up spill. Area of approx 20 sq m and approx 100 l of fuel had vented from wing. All refuelling ceased at this time.

05:38:00 Liaised with safety officers and engineers to determine cause and further problems. Area cleaned and detergent applied prior to washing area down. Area surrounding starboard wing to be kept clear of further movement.

05:47:00 Aircraft started venting fuel from same wing before area could be washed down. Safety officer applied material to soak up fuel.

05:50:00 Liaised with engineers who advised problem with fuel transfer system not allowing fuel to be directed into centre tank. They were going to decant some fuel from starboard wing to prevent further spillage until problem rectified. ARFF will maintain standby position.

05:59:00 Advised FCC to advise FC of situation report.

06:18:00 Engineers advise of attempt to transfer fuel from starboard wing and venting reoccurs, Foam blanket applied to area of approx 5 sq m.

06:26:00 FC given sitrep and advised FSM of situation. Safety officer to advise ECO of spill contained to hardstanding area with majority evaporating due to heat.

ARFF Incident Detail Report

Air Services Australia

PERTH

Incident No:

4163

06:48:00 Further update to FC advising situation with aircraft venting fuel each time engineers try to decant. Foam blanket maintained.

06:51:00 Liaise with captain and advise disembarking of passengers if further venting occurs as safety precaution. He agrees and will wait for further instructions from SO.

07:10:00 FC [REDACTED] and crew depart station for bay 55.

07:14:00 FC given sitrep on arrival to ascertain further actions. Discussion with engineers situation under control, still trying to rectify problem.

07:44:00 FSM informed of current situation. T1 and T4 standing by.

08:11:00 T1 returned to station, T4 to maintain standby position.

08:15:00 Another foam blanket applied as minor venting occurs, advised by pilot and engineers of situation, problem still occurring. ARFF to maintain standby position, FC notified.

08:53:00 Engineer advises decanting finished until safety valve located and repaired. Inform safety officer.

09:09:00 Safety officer applies detergent, ARFF wash area down. Advise FCC control time.

09:14:00 ARFF returned to station. FC notified of possible further requirement of ARFF at later time.

ARFF Incident Detail Report

Air Services Australia

PERTH

Incident No:

4235

ARFF Incident Details for Fire Non-Aircraft**12/02/2006**

Incident Site:	Mulch Producing Site-Vicinity Gate 8	Number of Lives Saved:	0
Origin of Call:	PABX	Number of Deaths:	0
Company:		Number of Injuries:	0
Est Damage Value:	\$200	Est Facility Value:	\$1000

Incident Times (UTC)

Call Time:	12/02/2006 23:56:00	Arrival Time:	12/02/2006 00:05:00	End Time:	12/02/2006 00:43:00
Dispatch Time:	12/02/2006 23:57:00	Control Time:	12/02/2006 00:36:00	Return Time:	12/02/2006 00:49:00

Materials Used

DCP Used:	0.00 kg	Foam Used:	40 litres
WaterUsed:	4000 litres	Other Used:	

Vehicles Involved

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
Other	1	Airport Safety	1	ULFV 8	1

Staff in Attendance

Team Leader:		FSM:	
Other Staff:			

Actions Taken

2356: Gate 4 Security(WAC Safety Officers) advise FCC of a fire in mulch stock pile immediately outside crash gate 8 and request ARFF to attend.

2359: ARFF waited for cat 9 acft to depart and responded to request.

0005: ARFF arrived & proceeded to dampen mulch pile with water through 2 x lines of one lenght each with a TFT/Akron branch. Monitor was also used to penetrate as deep as possible into mulch.

0010: ARFF requested WAC to supply Front end loader to spread/turnover pile.

0030: ARFF controlled/extinguished surface fire and continued to dampen down waiting for arrival of front end loader.

0036: Front end loader arrived also WAC water truck with hoses. ARFF advise WAC they are required to rtn airside for cat 9 movement. WAC advise they can handle it from here. ARFF handed over to WAC.

0043: Stop Time.

NOTE: Response delay due to cat 9 movements & ARFF required to exit through padlocked gate.

ARFF Incident Detail Report

Air Services Australia

PERTH

Incident No:

4391

ARFF Incident Details for Fuel Spillage

17/05/2006

Incident Site:	Taxiway D	Number of Lives Saved:	0
Origin of Call:	IC from Tower	Number of Deaths:	0
Company:		Number of Injuries:	1
Est Damage Value:	\$0	Est Facility Value:	\$0

Incident Times (UTC)

Call Time:	17/05/2006 07:36:00	Arrival Time:	17/05/2006 07:37:00	End Time:	17/05/2006 08:55:00
Dispatch Time:	17/05/2006 07:36:20	Control Time:	17/05/2006 07:51:00	Return Time:	17/05/2006 09:01:00

Materials Used

DCP Used:	0.00 kg	Foam Used:	260 litres
WaterUsed:	18000 litres	Other Used:	

Vehicles Involved

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
Other	1	Airport Safety	3	ULFV 8	3
Command Vehicle	1	FSM Vehicle	1		

Staff in Attendance

Team Leader:

FSM:

Other Staff:

Actions Taken

Airside

0736 FCC advised by TWR of aircraft on taxiway Delta leaking fuel.

073620 ARFF responded & took up tactical position on tail of aircraft.

0737 During ARFF attempt to contact aircraft on 131, transmission from pilot on ground advised aircraft was being evacuated.

073710 ARFF made contact with pilot on 131, who advised ARFF evacuation in progress, ARFF advised pilot fuel leaking from both wing and foam blanket being applied.

0740 ARFF made contact with pilot after his evacuation who confirmed 28 pob, all had been accounted for.

0743 ARFF advised one evacuated passenger required first aid for shortness of breath.

074310 ARFF responded, on location of passenger he advised ARFF he was now fine and required no assistance.

0745 Perth airport command vehicle transported POB to airport terminal

0751 Control time logged

0752 ARFF assisted safety officers to render leaked fuel on taxiway safe by way of detergent & absorbent roll, washed away with water.

ARFF Incident Detail Report

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Incident No:

4391

0755 Aircraft towed off taxiway to terminal parking bay escorted by one Mk8

0759 SO on escorting Mk8 advised FC aircraft had started to leak fuel and foam blanket being applied

0810 Engineers advised ARFF fuel leak had been fixed

0810 to 0854 ARFF with aid of safety officers dealt with leaked fuel on taxiways and apron washing areas clear. Under guidance of airport environmental officer

0855 End time

0901 All vehicles returned to station and relenished

ARFF Incident Detail Report

Air Services Australia

PERTH

Incident No:

5642

ARFF Incident Details for Fuel Spillage

20/02/2008

Incident Site:	T1 Bay 53	Number of Lives Saved:	0
Origin of Call:	Other	Number of Deaths:	0
Company:		Number of Injuries:	0
Est Damage Value:	\$0	Est Facility Value:	\$0

Incident Times (UTC)

Call Time:	20/02/2008 09:08:00	Arrival Time:	20/02/2008 09:11:00	End Time:	20/02/2008 09:30:00
Dispatch Time:	20/02/2008 09:09:00	Control Time:	20/02/2008 09:21:00	Return Time:	20/02/2008 09:38:00

Materials Used

DCP Used:	0.00 kg	Foam Used:	50 litres
WaterUsed:	1000 litres	Other Used:	

Vehicles Involved

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
ULFV 8	1				

Staff in Attendance

Team Leader:		FSM:	
Other Staff:			

Actions Taken

0908: Call from ACC via direct line to a fuel spill on Bay 53.

0909: FRV responded.

0911: FRV arrived. Acft was overfilled and approx 40 litres of fuel escaped from the Port wing fuel vent. The acft was Garuda 737 PK-GGD. Passengers had been allowed onto the acft. ARFF covered the fuel spill with foam using a 50mm hose and FB10X then allowed the acft to push back and depart. ARFF then washed the area down with water after the acft left.

0921: Control time.

0930: End time.

ARFF Incident Detail Report

Air Services Australia

PERTH

Incident No:

7959

ARFF Incident Details for Aircraft - Engine Fire**21/06/2010**

Incident Site: Taxiway Foxtrot
Origin of Call: FCC Observation
Company: [REDACTED]
Est Damage Value: \$0

Number of Lives Saved: 0
Number of Deaths: 0
Number of Injuries: 1
Est Facility Value: \$0

Incident Times (UTC)

Call Time: 21/06/2010 12:10:00	Arrival Time: 21/06/2010 12:11:00	End Time: 21/06/2010 16:35:00
Dispatch Time: 21/06/2010 12:10:00	Control Time: 21/06/2010 12:49:00	Return Time: 21/06/2010 16:35:00

Materials Used

DCP Used: 9.00 kg	Foam Used: 141 litres
WaterUsed: 2000 litres	Other Used:

Vehicles Involved

Vehicle Code	Quantity	Vehicle Code	Quantity	Vehicle Code	Quantity
Police	1	Airport Safety	3	DRV	1
ULFV 8	3	FSM Vehicle	1		

Staff in Attendance**Team Leader:** [REDACTED]**FSM:** [REDACTED]**Other Staff:**

[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	

Actions Taken

Incident 21/06/2010 12:10 -FCC operator heard a large bang and sighted aircraft on taxiway Foxtrot that had what appeared to be a small fire coming from the starboard engine. FCC initiated full turn out to Taxiway Foxtrot

Dispatch 21/06/2010 12:10 -Tenders 1,3 & 4 dispatched. FCC vacated. DRV T5 also responded and took up position at station adjacent to Taxiway Foxtrot to assist if required.

Arrival 21/06/2010 12:11 - ARFF arrived and took up tactical positions on the tail and starboard side of a Cessna 414 Conquest VH - LBD, the nose wheel had collapsed and a small fire had occurred in the starboard engine when the propellers had hit the ground. T4 and T 1 deployed FB10X branches and hose lines and a 9kg dry chemical powder extinguisher.The engine fire was extinguished using a 9kg DCP portable extinguisher and a foam blanket was laid down to cover fuel/hydraulic oil leaking from both engines. Aircraft checked for passengers, both the pilot ([REDACTED]) and engineer ([REDACTED]) had vacated the aircraft, the engineer had injured himself when jumping from the aircraft and had suffered a twisted ankle and lacerations to his knee, DRV crew administered first aid to the engineer who had made his way over to the fire station, approx. 30 m way from taxiway Foxtrot.

SITREP 21/06/2010 12:15 - Fire ground consolidated, aircraft checked, ARFF confirmed with engineer that engines had been made safe, fuel switches off, batteries isolated but not disconnected. The aircraft had suffered major damage to both propellers and the aircraft tow bar was still attached to the collapsed nose wheel, no tug on scene. ARFF placed buckets under each engine to catch any spillages.

ARFF Incident Detail Report

Air Services Australia

PERTH

Incident No:

7959

SITREP 21/06/2010 12:16 - LFF Eiffler, crew member from the DRV, reopened FCC.

SITREP 21/06/2010 12:17 - FSM [REDACTED] notified. FC [REDACTED] liaised with pilot and engineer and requested information on the location of the tug, they advised that the aircraft was not under tow but was taxiing under its own power back to Hangar 101 after engine run ups off Taxiway Hotel 4. FC [REDACTED] pointed out that the aircraft tow bar was still attached and this may have been incidental in the collapse of the nose wheel.

SITREP 21/06/2010 12:22 - FSM [REDACTED] requested sitrep. FC [REDACTED] advised Supt. [REDACTED] of current situation, Supt. [REDACTED] advised he would contact Operational Capability and Standards Manager via mobile phone.

SITREP 21/06/2010 12:30 - ACC advised. FC [REDACTED] requested, via safety officers, that ATSB be advised of incident.

Returned 21/06/2010 12:39 - Tender 1 returned to station, SO [REDACTED] remained at incident

Returned 21/06/2010 12:42 - Tender 5 returned to station. FSM T8 vehicle arrived.

SITREP 21/06/2010 12:45 - Safety Officer contacted [REDACTED] ATSB

Control 21/06/2010 12:49 - Incident under control, control time called. Tender 3 returned to station with SO [REDACTED]

SITREP 21/06/2010 12:50 - Safety Officer advised ARFF that ATSB had approved aircraft could be moved back to hangar 101.

SITREP 21/06/2010 13:17 - Tug arrived at aircraft, Chief engineer checked aircraft and turned off all power to aircraft.

SITREP 21/06/2010 13:21 - FC [REDACTED] advised FCC that Chief engineer [REDACTED] on site. T4 to standby while aircraft is lifted and prepared for removal from Taxiway Foxtrot to Hangar 101.

SITREP 21/06/2010 15:10 - FCV T4 crew relieved by FRV T1 crew, HO/TO between FC [REDACTED] and SO [REDACTED].

SITREP 21/06/2010 15:11 - T 8 departed - Supt. [REDACTED] off scene

SITREP 21/06/2010 16:17 - Aircraft moved from Taxiway Foxtrot to Hangar 101, FCV T4 accompanied aircraft. DRV T5 dispatched to hose foam and any smaller debris from taxiway. Safety Officer inspected taxiway.

Returned 21/06/2010 16:28 - FCV T4 returned

End 21/06/2010 16:35 - SO [REDACTED] advises all operational objectives met, end time.

Return 21/06/2010 16:35 - DRV T5 returned to station.

Appendix G

Site Inspection Photo Log

PHOTOGRAPHIC LOG

Site Name: Perth Airport		Site Location: Perth Airport FTG	Project No: 60509115
Plate No. 1	Date: 18/07/2016		
Direction Photo Taken: Looking North East - Airport North			
Description: The FTG, concrete pad, mock aircraft and helicopter.			

Plate No. 2	Date: 18/07/2016	
Direction Photo Taken: Looking south east – Airport North		
Description: The drainage valve for concrete pad and looking towards unused gas AST.		

PHOTOGRAPHIC LOG

PHOTOGRAPHIC LOG			
Site Name: Perth Airport		Site Location: Perth Airport FTG	
Project No: 60509115			
Plate No. 3	Date: 18/07/2016		
Direction Photo Taken: North west – Airport North			
Description: The FTG aircraft fuel drums and bundled kerosene AST.			

Plate No. 4	Date: 18/07/2016	
Direction Photo Taken: Looking South East – Airport North		
Description: The water evaporation pond and treatment facility.		

PHOTOGRAPHIC LOG

PHOTOGRAPHIC LOG			
Site Name: Perth Airport		Site Location: Airport Incinerator	Project No: 60509115
Plate No. 5	Date: 18/07/2016		
Direction Photo Taken: North East – Airport North			
Description: The Airport incinerator.			
Plate No. 6	Date: 18/07/2016		
Direction Photo Taken: North East – Airport North			
Description: The road toward incinerator north of FTG It is within this area where AFFF was used during training.			

PHOTOGRAPHIC LOG

Site Name: Perth Airport		Site Location: Perth Airport (Combined Training Area)	Project No: 60509115
Plate No. 7	Date: 18/07/2016		
Direction Photo Taken: North west – Airport Central			
Description: Area where the reported bus and cars were used in this area for combined Emergency Services activities			

Plate No. 8	Date: 18/07/2016	
Direction Photo Taken: North west – Airport Central		
Description: The soil stockpile area along eastern boundary		

PHOTOGRAPHIC LOG

Site Name: Perth Airport		Site Location: Northern Main Drain	Project No: 60509115
Plate No. 9	Date: 18/07/2016		
Direction Photo Taken: North East – Airport East			
Description: The northern main drain channel on airport eastern boundary.			

Plate No. 10	Date: 18/07/2016	
Direction Photo Taken: North East – Airport Central and Airfield		
Description: Looking across runway towards international terminal T1. These show the surface drainage channels.		

PHOTOGRAPHIC LOG

Site Name: Perth Airport		Site Location: BP Fuel Farm and T1 and T2 area	Project No: 60509115
Plate No. 11	Date: 18/07/2016		
Direction Photo Taken: North east – Airport Central			
Description: Looking to BP Fuel Farm from across airport from T4 area.			
Plate No. 12	Date: 18/07/2016		
Direction Photo Taken: South West – Airport West			
Description: The drainage dam south of the T3 area.			

PHOTOGRAPHIC LOG

PHOTOGRAPHIC LOG			
Site Name: Perth Airport		Site Location: Airservices leased maintenance area	Project No: 60509115
Plate No. 13	Date: 18/07/2016		
Direction Photo Taken: West – Airport West			
Description: The former maintenance buildings previously used by Airservices.			

Appendix H

Calibration Certificates



AES

ACTIVE ENVIRONMENTAL SOLUTIONS

Calibration Report

Multi-Parameter Water Quality Instrument

Customer: Aecom

Contact: [REDACTED]

Manufacturer: YSI

Instrument: Professional Plus with Quatro cable

Serial #: 15K100321

Cable length: 1m

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 60 minutes if not used
Connections	Condition	✓	Good, clean
	Cable	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	159.80 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 1 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

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

						Instrument Readings		
Parameter	Standards	Reference	Calibration Point	Span	Units	Before	After	Units
Temperature	Center 370 Thermometer	Room Temp	20.1	0	°C	NA	20.1	°C
pH	pH 7.00	NF1971	7.01	-48.30	mV	7.83	7.03	pH
pH	pH 4.00	NF1636	4.00	111.50	mV	5.08	4.00	pH
Conductivity	2760 µs/cm at 25°C	NF2056	2760	GLP	5.08	2758	2760	µs/cm
ORP (Reference check only)	Zobell A & B	NG1334/1335	240	240	mV	238.7	238.9	mV
Zero Dissolved Oxygen	NaSO3 in distilled water	1504192304	0.0	NA	NA	0.6	0.0	%
100% Dissolved Oxygen	100% Air Saturation	Air	100.0	5.37	uA	118.4	100	%

Calibrated by: [REDACTED]

Calibration Date: 15-Aug-17

Next Due: 14-Sep-17

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ACTIVE ENVIRONMENTAL SOLUTIONS

Calibration Report

Multi-Parameter Water Quality Instrument

Customer: Aecom

Contact: [REDACTED]

Manufacturer: YSI

Instrument: Professional Plus with Quatro cable

Serial #: 15K100325

Cable length: 1m

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 60 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Lid	Condition, seals and O-rings	✓	
Instrument housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	166.90 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 0 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µS/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

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

						Instrument Readings		
Parameter	Standards	Reference	Calibration Point	Span	Units	Before	After	Units
Temperature	Center 370 Thermometer	Room Temp	21.8	-0.1	°C	NA	21.7	°C
pH	pH 7.00	NF1971	7.01	-38.70	mV	6.95	7.03	pH
pH	pH 4.00	NF1636	4.00	128.20	mV	3.9	4.00	pH
Conductivity	2760 µS/cm at 25°C	NF2056	2760	GLP	5.12	2790	2760	µS/cm
ORP (Reference check only)	Zobell A & B	NG1334/1335	236	236	mV	244.2	236	mV
Zero Dissolved Oxygen	NaSO3 in distilled water	1504192304	0.0	NA	NA	0.1	0.0	%
100% Dissolved Oxygen	100% Air Saturation	Air	100.0	5.2	uA	99.4	99.9	%

Calibrated by: [REDACTED]

Calibration Date: 19-Sep-17

Next Due: 19-Oct-17

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ACTIVE ENVIRONMENTAL SOLUTIONS

Calibration Report

Multi-Parameter Water Quality Instrument

Customer: Aecom

Contact: [REDACTED]

Manufacturer: YSI

Instrument: Professional Plus with Quatro cable

Serial #: 15K100321

Cable length: 1m

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 60 minutes if not used
Connections	Condition	✓	Good, clean
	Operation	✓	Clean, no tears
Cable	Condition	✓	
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
L	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	172.70 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 2 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µS/cm
Dissolved Oxygen			
Condition		✓	Good, clean
sensor in use		✓	Galvanic
0.5 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

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

						Instrument Readings		
Parameter	Standards	Reference	Calibration Point	Span	Units	Before	After	Units
Temperature	Center 370 Thermometer	Room Temp	20.2	-0.2	°C	NA	20	°C
pH	pH 7.00	NF1971	7.01	-5.50	mV	7.09	7.03	pH
pH	pH 4.00	NF1636	4.00	167.20	mV	4.12	4.00	pH
Conductivity	2760 µS/cm at 25°C	NF2056	2760	GLP	5.13	2735	2760	µS/cm
ORP (Reference check only)	Zobell A & B	NG1334/1335	240	240	mV	284	238.1	mV
Zero Dissolved Oxygen	NaSO3 in distilled water	1504192304	0.0	NA	NA	-0.4	0.0	%
100% Dissolved Oxygen	100% Air Saturation	Air	100.0	5.3	uA	93.7	100	%

Calibrated by: [REDACTED]

Calibration Date: 02-Oct-17

Next Due: 01-Nov-17

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ACTIVE ENVIRONMENTAL SOLUTIONS

Calibration Report

Multi-Parameter Water Quality Instrument

Customer: Aecom

Contact: [REDACTED]

Manufacturer: YSI

Instrument: Professional Plus with Quatro cable

Serial #: 15H103057

Cable length: 1m

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 60 minutes if not used
	Condition	✓	Good, clean
Connections	Condition	✓	Clean, no tears
Cable	Condition	✓	
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
UI	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	176.10 mV
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	55 to 60 mV/pH, ideal 59mV
pH slope		✓	
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	variance range ± 20mV
Calibrated and conforms to manufacturer's specifications		✓	-3 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µS/cm
Dissolved Oxygen			
Condition		✓	Good, clean
Sensor in use		✓	Galvanic
1.5 mil PE membrane (yellow membrane):		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
DO Sensor Value		✓	ppm
Calibrated and conforms to manufacturer's specifications		✓	

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

Parameter	Standards	Reference	Calibration Point	Span	Units	Instrument Readings		
						Before	After	Units
Temperature	Center 370 Thermometer	Room Temp	23.4	-0.2	°C	NA	23.2	°C
pH	pH 7.00	NF1971	7.01	-16.60	mV	6.98	7.01	pH
pH	pH 4.00	NF1636	4.00	159.50	mV	3.91	4.00	pH
Conductivity	2760 µS/cm at 25°C	NF2046	2760	GLP	5.27	2618	2760	µS/cm
ORP (Reference check only)	Zobell A & B	NG1334/1335	233	233	mV	237.2	235.5	mV
Zero Dissolved Oxygen	NaSO3 in distilled water	1504192304	0.0	NA	NA	0	0.0	%
100% Dissolved Oxygen	100% Air Saturation	Air	100.0	6.33	uA	91.1	100	%

Calibrated by: [REDACTED]

Calibration Date: 07-Nov-17

Next Due: 07-Dec-17

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ACTIVE ENVIRONMENTAL SOLUTIONS

Calibration Report

MiniRAE 3000 - VOC

Customer: Aecom

Contact: [REDACTED]

Manufacturer: RAE Systems

Instrument: MiniRAE 3000

Model: PGM-7320

Serial #: 592-907986

Item	Test	Pass	Comments
Battery	Li Ion	✓	4.2v/3300mAH rechargeable Lithium-Ion battery pack
Charger	Charger, Power supply	✓	
	Cradle, travel charger	✓	
Filter	Filter, fitting, etc	✓	
Alar	Alarm Mode	✓	Auto Reset
	Buzzer & Light	✓	Both On
Datalogger	Datalog	✓	Cleared
	Interval	✓	60 secs
	Data Selection	✓	Minimum, Average, Maximum
	Datalog Type	✓	Auto
Display	Operation	✓	
Switches	Operation	✓	
PCB	Operation - Main	✓	
Connectors	Charging port	✓	
Firmware	Version	✓	2.14
Monitor	Operation mode	✓	Hygiene mode
	User mode	✓	Advanced
	Time	✓	24 hour
	Pump Duty Cycle	✓	100%
	Pump Speed	✓	High
	Pump Flow Rate	✓	>400 ml/min
	Temperature	✓	Degree Celsius
	Real Time Protocol	✓	P2P (cable)
	Power on Zero	✓	Off
	Lamp ID	✓	10.6 eV
Monitor housing	Condition	✓	Clean
Case	Rubber boot	✓	Yellow
			Alarms
			Sensors
			High
			Low
			STEL
			TWA
			VOC
			100 ppm
			50 ppm
			25 ppm
			10 ppm

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

Sensor	Lamp ID	Span Gas	Concentration	Cyl. No.	CF	Zero	Span
VOC		Isobutylene	100 ppm	WO137773-1	1	0.0 ppm	100.0 ppm

Calibrated by: [REDACTED]

Calibration Date: 11-Sep-17

Next Due: 11-Oct-17

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ACTIVE ENVIRONMENTAL SOLUTIONS

Calibration Report

MultiRAE Lite

Customer: Aecom

Contact: [REDACTED]

Manufacturer: RAE Systems

Instrument: MultiRAE Lite

Model: PGM-6208

Serial #: M01C009718

Item	Test	Pass	Comments
Battery	Lithium-ion battery	✓	Fully charged
Charger	Cradle, travel charger	✓	
Connectors	Charging port	✓	
Filter	Filter, fitting	✓	
Display	Operation	✓	
Switches	Operation	✓	
Firmware	Application Software	✓	V.1.40
	Sensor Software	✓	V.1.40B
Datalog	Operation	✓	Auto Log
	Clear Datalog	✓	
	Datalog Interval	✓	60 seconds
	Data Selection	✓	Minimum, Average, Maximum, Real-Time
	Datalog Type	✓	Automatic
	Memory Full Action	✓	Stop when full
Monitor	Operation Mode	✓	Hygiene Mode
	Pump speed	✓	High
	Pump Flow Rate	✓	>400 ml/min
	Zero at start	✓	Off
	Fast Startup	✓	On
	Date format	✓	DD/MM/YYYY
	Time format	✓	24 hour
	User Mode	✓	Basic
	Backlight	✓	Automatic
Monitor housing	Condition	✓	Clean
Case	Rubber boot	✓	Yellow
Alarms	Alarm Mode	✓	Auto Reset
	Alarm Settings	✓	All enabled-light, buzzer, vibration
	Comfort Beep	✓	Off

Alarms

Sensors	High	Low	STEL	TWA
O2	23.5%	19.5%	NA	NA
LEL	20%	10%	NA	NA
CO	200 ppm	35 ppm	100 ppm	35 ppm
H2S	20 ppm	10 ppm	15 ppm	10 ppm
VOC	100 ppm	50 ppm	25 ppm	10 ppm

This report certifies that the above instrument has been calibrated to the following specifications:

Sensor	Serial #	Span Gas	Concentration	Cyl. No.	CF	Zero	Span
O2		Oxygen	20.9%	Fresh Air		20.9%	20.9%
O2		Oxygen	18.0%	WO137772-1		NA	18.0%
LEL		2.5% Methane	50%	WO137772-1		0%	50%
H2S		Hydrogen Sulfide	10 ppm	WO137772-1		0.0 ppm	10.0 ppm
CO		Carbon Monoxide	50 ppm	WO137772-1		0.0 ppm	50 ppm
VOC		Isobutylene	100 ppm	WO137773-1	1	0.0 ppm	100.0 ppm

Calibrated by: [REDACTED]

Calibration Date: 28-Sep-17

Next Due: 28-Oct-17

Melbourne Head Office
Sydney S14 Lvl 2
Perth Unit 6
Brisbane Unit 17

2 Merchant Avenue
6-8 Holden Street
41 Holder Way
23 Ashtan Place

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AES

ACTIVE ENVIRONMENTAL SOLUTIONS

Calibration Report

MiniRAE 3000 - VOC

Customer: Aecom

Contact: [REDACTED]

Manufacturer: RAE Systems

Instrument: MiniRAE 3000

Model: PGM-7320

Serial #: 592-906777

Item	Test	Pass	Comments		
Battery	Li Ion	✓	4.2v/3300mAH rechargeable Lithium-Ion battery pack		
Charger	Charger, Power supply	✓			
	Cradle, travel charger	✓			
Filter	Filter, fitting, etc	✓			
Alarms	Alarm Mode	✓	Auto Reset		
	Buzzer & Light	✓	Both On		
Datalogger	Datalog	✓	Cleared		
	Interval	✓	60 secs		
	Data Selection	✓	Minimum, Average, Maximum		
	Datalog Type	✓	Auto		
Display	Operation	✓			
Switches	Operation	✓			
PCB	Operation - Main	✓			
Connectors	Charging port	✓			
Firmware	Version	✓	1.20A		
Monitor	Operation mode	✓	Hygiene mode		
	User mode	✓	Advanced		
	Time	✓	24 hour		
	Pump Duty Cycle	✓	100%		
	Pump Speed	✓	High		
	Pump Flow Rate	✓	>400 ml/min		
	Temperature	✓	Degree Celsius		
	Real Time Protocol	✓	P2P (cable)		
	Power on Zero	✓	Off		
	Lamp ID	✓	10.6 eV		
Monitor housing	Condition	✓	Clean		
Case	Rubber boot	✓	Yellow		
Alarms					
Sensors		High	Low	STEL	TWA
VOC		100 ppm	50 ppm	25 ppm	10 ppm

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

Sensor	Lamp ID	Span Gas	Concentration	Cyl. No.	CF	Zero	Span
VOC		Isobutylene	100 ppm	S58235-2	1	0.0 ppm	100.0 ppm

Calibrated by: [REDACTED]

Calibration Date: 28-Sep-17

Next Due: 27-Mar-18

Melbourne Head Office
Sydney 514 Lvl 2
Perth Unit 6
Brisbane Unit 17

2 Merchant Avenue
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41 Holder Way
23 Ashtan Place

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Appendix I

Waste Certificates



CERTIFICATE OF DISPOSAL

CERTIFICATE NUMBER: 0216223

This is to certify that Toxfree Australia Pty Ltd (TES Kwinana) has treated and disposed of the material as detailed below at Lot 4, Mason Road Kwinana. This plant is licensed by The Department of Environmental Conservation for the treatment of such material. Licence No: L6297/1993/11.

Details of material destroyed:

Source of material: **AECOM SERVICES PTY LTD**
 Kalamunda Rd
 PERTH AIRPORT, WA

Project 60543717 Task 1.3

Material: 4 x 20L Drums of Contaminated Water – PFAS & Hydrocarbon
 10kg of Contaminated Soil

Date received: 23/11/2017

Signed on behalf of Tox Free:

Name: 
Position: Operations Manager
Date: 23/11/2017

NOTE THAT THE ABOVE RECORDS CAN BE VERIFIED BY REFERENCE TO THE PLANT PRODUCTION LOGS RETAINED AT TOX FREE AUSTRALIA PTY LTD PREMISES IN KWINANA.



CERTIFICATE OF DISPOSAL

CERTIFICATE NUMBER: 0216218

This is to certify that Toxfree Australia Pty Ltd (TES Kwinana) has treated and disposed of the material as detailed below at Lot 4, Mason Road Kwinana. This plant is licensed by The Department of Environmental Conservation for the treatment of such material. Licence No: L6297/1993/11.

Details of material destroyed:

Source of material: AECOM SERVICES PTY LTD
South Western Drilling
276 Berkshire Rd
FORRESTFIELD, WA

Project 60543717 Task 1.3

Material: 5 x 205L Drums of Hydrocarbon Contaminated Soil

Date received: 23/11/2017

Signed on behalf of Tox Free:

Name:	
Position:	Operations Manager
Date:	23/11/2017

NOTE THAT THE ABOVE RECORDS CAN BE VERIFIED BY REFERENCE TO THE PLANT PRODUCTION LOGS RETAINED AT TOX FREE AUSTRALIA PTY LTD PREMISES IN KWINANA.

www.toxfree.com.au

safe.reliable.sustainable

Appendix J

Bore Logs

SOIL BOREHOLE SB1703

AECOM Lvl 6, 3 Forrest Place
Perth WA 6000

Phone 08-9326 0100
Fax 08-9326 0296

Project Reference: **PSI with Limited Investigation at Perth Airport**

Client: **Airservices Australia**

Location: **Perth Airport, Western Australia**

Drilling Contractor: **[REDACTED]**

Project No.: **60543717**

Logged By: **[REDACTED]**

Bore Size: **150 mm**

Relative Level: **mRL**

Drill Type: **Hand Auger**

Checked By: **[REDACTED]**

Total Depth: **1.50 m**

Coordinates: **6464104.49 mN**

Drill Model: **Geoprobe**

Date Started: **2-10-17**

Casing Size: **mm**

401495.55 mE

Drill Fluid: **None**

Date Finished: **2-10-17**

Permit No: **N/A**

Method	Casing	Penetration			Ground Water Data and Comments	Depth (m)	Graphic Log	Classification	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), additional observations	Moisture Condition	Consistency	Relative Density	Sample Interval PID (ppm)	Sample ID
		S	M	H R										
						0		SW	grey, coarse grained, well graded SAND, subrounded to subangular.	D			0.8	SB1703_0.0-0.1
													1.5	SB1703_0.1-0.5
						1								
													2.7	SB1703_1.4-1.5
								SW	End of hole at target depth of 1.5 mbgl.	M				

APEC 6

SOIL BOREHOLE SB1704

AECOM Lvl 6, 3 Forrest Place
Perth WA 6000

Phone 08-9326 0100
Fax 08-9326 0296

Project Reference: **PSI with Limited Investigation at Perth Airport**

Client: **Airservices Australia**

Drilling Contractor: XXXXXXXXXX

Project No.: **60543717**

Location: **Perth Airport, Western Australia**

Logged By: XXXXXXXXXX

Bore Size: **150 mm**

Relative Level: **mRL**

Drill Type: **Hand Auger**

Checked By: XXXXXX

Total Depth: **1.00 m**

Coordinates: **6464703.13 mN**

Drill Model: **Geoprobe**

Date Started: **2-10-17**

Casing Size: **mm**

401620.98 mE

Drill Fluid: **None**

Date Finished: **2-10-17**

Permit No: **N/A**

Method	Casing	Penetration				Ground Water Data and Comments	Depth (m)	Graphic Log	Classification	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), additional observations	Moisture Condition	Consistency	Relative Density	Sample Interval PID (ppm)	Sample ID
		S	M	H	R										
							0		SP	grey, coarse grained, well graded SAND, subrounded to subangular.	D			4.3	SB1704_0.0_0.1
														0.7	SB1704_0.1_0.5
														2.3	SB1704_0.8_1.0
							1			End of hole at depth of 1.0 mbgl due to collapse.					

APEC 6

SOIL BOREHOLE SB1705

AECOM Lvl 6, 3 Forrest Place
Perth WA 6000

Phone 08-9326 0100
Fax 08-9326 0296

Project Reference: **PSI with Limited Investigation at Perth Airport**

Client: **Airservices Australia**

Drilling Contractor: XXXXXXXXXX

Project No.: **60543717**

Location: **Perth Airport, Western Australia**

Logged By: XXXXXXXXXX

Bore Size: **150 mm**

Relative Level: **mRL**

Drill Type: **Hand Auger**

Checked By: XXXXXX

Total Depth: **1.00 m**

Coordinates: **6464795.81 mN**

Drill Model: **Geoprobe**

Date Started: **2-10-17**

Casing Size: **mm**

401549.19 mE

Drill Fluid: **None**

Date Finished: **2-10-17**

Permit No: **N/A**

Method	Casing	Penetration			Ground Water Data and Comments	Depth (m)	Graphic Log	Classification	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), additional observations	Moisture Condition	Consistency	Relative Density	Sample Interval PID (ppm)	Sample ID
		S	M	H R										
						0		SP	grey, coarse grained, poorly graded SAND, subrounded to subangular.	M			1.8	SB1705_0.0_0.1
													0.6	SB1705_0.1_0.5
										W			0.2	SB1705_0.8_1.0
						1			End of hole at depth of 1.0 mbgl due to collapse. No impacts observed throughout the soil profile.					

APEC 6

Drill Type: **Hand Auger**
Drill Model: **Geoprobe**
Drill Fluid: **None**

APEC 6

Drill Type: **Hand Auger**
Drill Model: **Geoprobe**
Drill Fluid: **None**

ENVR MELB PERTH ASA LOGS.GPJ WCC AUS.GDT 21/11/17

SOIL BOREHOLE SB1708

AECOM Lvl 6, 3 Forrest Place Perth WA 6000		Phone 08-9326 0100 Fax 08-9326 0296	Project Reference: PSI with Limited Investigation at Perth Airport	Client: Airservices Australia
Drilling Contractor: [REDACTED]			Project No.: 60543717	Location: Perth Airport, Western Australia
Logged By: [REDACTED]	Bore Size: 150 mm	Relative Level: mRL	Drill Type: Hand Auger	
Checked By: [REDACTED]	Total Depth: 1.50 m	Coordinates: 6464517.78 mN	Drill Model: Geoprobe	
Date Started: 2-10-17	Casing Size: mm	401597.25 mE	Drill Fluid: None	
Date Finished: 2-10-17		Permit No: N/A		

Method	Casing	Penetration			Ground Water Data and Comments	Depth (m)	Graphic Log	Classification	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), additional observations	Moisture Condition	Consistency	Relative Density	Sample Interval PID (ppm)	Sample ID
		S	M	H R										
						0		SP	grey, coarse grained, poorly graded SAND, subangular to subrounded.	D/M			0.8	SB1708_0.0-0.1
													1.5	SB1708_0.1-0.5
						1				M				
														SB1708_1.4-1.5
									End of hole at target depth of 1.5 mbgl.					

APEC 6

SOIL BOREHOLE SB1710

AECOM Lvl 6, 3 Forrest Place
Perth WA 6000

Phone 08-9326 0100
Fax 08-9326 0296

Project Reference: **PSI with Limited Investigation at Perth Airport**

Client: **Airservices Australia**

Drilling Contractor: XXXXXXXXXX

Project No.: **60543717**

Location: **Perth Airport, Western Australia**

Logged By: XXXXXXXXXX

Bore Size: **150 mm**

Relative Level: **mRL**

Drill Type: **Hand Auger**

Checked By: XXXXXX

Total Depth: **1.00 m**

Coordinates: **6464551.73 mN**

Drill Model: **Geoprobe**

Date Started: **2-10-17**

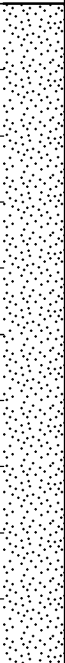
Casing Size: **mm**

401553.90 mE

Drill Fluid: **None**

Date Finished: **2-10-17**

Permit No: **N/A**

Method	Casing	Penetration				Ground Water Data and Comments	Depth (m)	Graphic Log	Classification	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), additional observations	Moisture Condition	Consistency	Relative Density	Sample Interval PID (ppm)	Sample ID
		S	M	H	R										
							0		SP	brown/grey, coarse grained, poorly graded SAND, subrounded to subangular with organic matter.	M			1.0	SB1710_0.0_0.1
														0.2	SB1710_0.1_0.5
														1.6	SB1710_0.8_1.0
							1			End of hole at target depth of 1.0 mbgl. No impacts observed throughout the soil profile.	W				

APEC 6

Drill Type: **Hand Auger**
Drill Model: **Geoprobe**
Drill Fluid: **None**

APEC 3B

SOIL BOREHOLE SB1713

AECOM Lvl 6, 3 Forrest Place
Perth WA 6000

Phone 08-9326 0100
Fax 08-9326 0296

Project Reference: **PSI with Limited Investigation at Perth Airport**

Client: **Airservices Australia**

Location: **Perth Airport, Western Australia**

Drilling Contractor: **[REDACTED]**

Project No.: **60543717**

Logged By: **[REDACTED]**

Bore Size: **150 mm**

Relative Level: **mRL**

Drill Type: **Hand Auger**

Checked By: **[REDACTED]**

Total Depth: **1.50 m**

Coordinates: **6467719.94 mN**

Drill Model: **Geoprobe**

Date Started: **3-10-17**

Casing Size: **mm**

403666.02 mE

Drill Fluid: **None**

Date Finished: **3-10-17**

Permit No: **N/A**

Method	Casing	Penetration				Ground Water Data and Comments	Depth (m)	Graphic Log	Classification	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), additional observations	Moisture Condition	Consistency	Relative Density	Sample Interval PID (ppm)	Sample ID
		S	M	H	R										
							0		SP	brown/yellow, coarse grained, poorly graded SAND, subrounded to subangular.	D			1.9	SB1713_0.0_0.1
														2.4	SB1713_0.1_0.5
							1								
										End of hole at target depth of 1.5 mbgl. No impacts observed throughout the soil profile.					

APEC 3B

SOIL BOREHOLE SB1714

AECOM Lvl 6, 3 Forrest Place
Perth WA 6000

Phone 08-9326 0100
Fax 08-9326 0296

Project Reference: **PSI with Limited Investigation at Perth Airport**

Client: **Airservices Australia**

Location: **Perth Airport, Western Australia**

Drilling Contractor: **[REDACTED]**

Project No.: **60543717**

Logged By: **[REDACTED]**

Bore Size: **150 mm**

Relative Level: **mRL**

Drill Type: **Hand Auger**

Checked By: **[REDACTED]**

Total Depth: **1.50 m**

Coordinates: **6467733.25 mN**

Drill Model: **Geoprobe**

Date Started: **3-10-17**

Casing Size: **mm**

403659.34 mE

Drill Fluid: **None**

Date Finished: **3-10-17**

Permit No: **N/A**

Method	Casing	Penetration				Ground Water Data and Comments	Depth (m)	Graphic Log	Classification	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), additional observations	Moisture Condition	Consistency	Relative Density	Sample Interval PID (ppm)	Sample ID
		S	M	H	R										
							0		SP	brown/yellow, coarse grained, poorly graded SAND, subrounded to subangular.	D			2.0	SB1714_0.0_0.1
														0.8	SB1714_0.1_0.5
							1								
										End of hole at target depth of 1.5 mbgl. No impacts observed throughout the soil profile.					

Remarks: APEC 3B
Old Incinerator Building

SOIL BOREHOLE SB1715

AECOM Lvl 6, 3 Forrest Place
Perth WA 6000

Phone 08-9326 0100
Fax 08-9326 0296

Project Reference: **PSI with Limited Investigation at Perth Airport**

Client: **Airservices Australia**

Location: **Perth Airport, Western Australia**

Drilling Contractor: XXXXXXXXXX

Project No.: **60543717**

Logged By: XXXXXXXXXX

Bore Size: **150 mm**

Relative Level: **mRL**

Drill Type: **Hand Auger**

Checked By: XXXXXX

Total Depth: **1.50 m**

Coordinates: **6466146.12 mN**

Drill Model: **Geoprobe**

Date Started: **12-9-17**

Casing Size: **mm**

403156.00 mE

Drill Fluid: **None**

Date Finished: **12-9-17**

Permit No: **N/A**

Method	Casing	Penetration			Ground Water Data and Comments	Depth (m)	Graphic Log	Classification	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), additional observations	Moisture Condition	Consistency	Relative Density	Sample Interval PID (ppm)	Sample ID
		S	M	HR										
						0		SP	grey/brown, coarse grained, poorly graded SAND, subrounded.				1.6	SB1715_0.0_0.1
													1.3	SB1715_0.1_0.5
									Grades to yellow.					
						1		SP	white, fine grained, poorly graded SAND, subrounded to subangular.				0.6	SB1715_0.8_1.0
													0.9	SB1715_1.3_1.5
									End of hole at target depth of 1.5 mbgl. No impacts observed throughout the soil profile.					

Remarks: APEC 5
Former Fire Training Ground

Drill Type: **Hand Auger**
Drill Model: **Geoprobe**
Drill Fluid: **None**

APEC 4

Drill Type: **Hand Auger**
Drill Model: **Geoprobe**
Drill Fluid: **None**

APEC 5

SOIL BOREHOLE SB1720

AECOM Lvl 6, 3 Forrest Place Perth WA 6000		Phone 08-9326 0100 Fax 08-9326 0296	Project Reference: PSI with Limited Investigation at Perth Airport	Client: Airservices Australia
Drilling Contractor: [REDACTED]			Project No.: 60543717	Location: Perth Airport, Western Australia
Logged By: [REDACTED]	Bore Size: 150 mm	Relative Level: mRL	Drill Type: Hand Auger	
Checked By: [REDACTED]	Total Depth: 1.80 m	Coordinates: 6466206.22 mN	Drill Model: Geoprobe	
Date Started: 12-9-17	Casing Size: mm	403377.05 mE	Drill Fluid: None	
Date Finished: 12-9-17		Permit No: N/A		

Method	Casing	Penetration			Ground Water Data and Comments	Depth (m)	Graphic Log	Classification	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), additional observations	Moisture Condition	Consistency	Relative Density	Sample Interval PID (ppm)	Sample ID
		S	M	H R										
						0		SW	light grey, medium grained, well graded SAND, subangular.	D			0.3	SB1720_0.0_0.1
													0.3	SB1720_0.1_0.5
								SW	white, medium grained, well graded SAND, subangular.	D			0.3	SB1720_0.8_1.0
						1							0.3	SB1720_1.3_1.5
									End of hole at target depth of 1.8 mbgl. No impacts observed throughout the soil profile.					

APEC 5

SOIL BOREHOLE SB1721

AECOM Lvl 6, 3 Forrest Place
Perth WA 6000

Phone 08-9326 0100
Fax 08-9326 0296

Project Reference: **PSI with Limited Investigation at Perth Airport**

Client: **Airservices Australia**

Location: **Perth Airport, Western Australia**

Drilling Contractor: XXXXXXXXXX

Project No.: **60543717**

Logged By: XXXXXXXXXX

Bore Size: **150 mm**

Relative Level: **mRL**

Drill Type: **Hand Auger**

Checked By: XXXXXX

Total Depth: **1.50 m**

Coordinates: **6466094.37 mN**

Drill Model: **Geoprobe**

Date Started: **12-9-17**

Casing Size: **mm**

403170.86 mE

Drill Fluid: **None**

Date Finished: **12-9-17**

Permit No: **N/A**

Method	Casing	Penetration			Ground Water Data and Comments	Depth (m)	Graphic Log	Classification	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), additional observations	Moisture Condition	Consistency	Relative Density	Sample Interval PID (ppm)	Sample ID
		S	M	HR										
						0		SP	grey/brown, coarse grained, well graded SAND, angular to subangular, with gravel (4-20mm). Roadbase.	D			 0.4	SB1721_0.0_0.1
													 0.7	SB1721_0.1_0.5
									Grades to less gravel.				 1.2	SB1721_0.8_1.0
						1		SP	yellow, medium grained, poorly graded SAND, subrounded.	M			 1.7	SB1721_1.3_1.5
									End of hole at target depth of 1.5 mbgl. No impacts observed throughout the soil profile.					

Remarks: APEC 5
Former Fire Training Ground

SOIL BOREHOLE SB1722

AECOM Lvl 6, 3 Forrest Place
Perth WA 6000

Phone 08-9326 0100
Fax 08-9326 0296

Project Reference: **PSI with Limited Investigation at Perth Airport**

Client: **Airservices Australia**

Location: **Perth Airport, Western Australia**

Drilling Contractor: XXXXXXXXXX

Project No.: **60543717**

Logged By: XXXXXXXXXX

Bore Size: **150 mm**

Relative Level: **mRL**

Drill Type: **Hand Auger**

Checked By: XXXXXX

Total Depth: **1.80 m**

Coordinates: **6467032.56 mN**

Drill Model: **Geoprobe**

Date Started: **12-9-17**

Casing Size: **mm**

402773.60 mE

Drill Fluid: **None**

Date Finished: **12-9-17**

Permit No: **N/A**

Method	Casing	Penetration			Ground Water Data and Comments	Depth (m)	Graphic Log	Classification	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), additional observations	Moisture Condition	Consistency	Relative Density	Sample Interval PID (ppm)	Sample ID
		S	M	H R										
						0		SW	grey, medium grained, well graded SAND, subangular, trace fines.	D			0.3	SB1722_0.0_0.1
													0.3	SB1722_0.1_0.5
													0.5	SB1722_0.8_1.0
						1		SW	light grey, medium grained, well graded SAND, subangular.	D			0.2	SB1722_1.3_1.5
									End of hole at target depth of 1.8 mbgl. No impacts observed throughout the soil profile.					

Remarks: APEC 4
Current Fire Station

Drill Type: **Hand Auger**
Drill Model: **Geoprobe**
Drill Fluid: **None**

Remarks: APEC 4
Current Fire Station

SOIL BOREHOLE SB1725

AECOM Lvl 6, 3 Forrest Place
Perth WA 6000

Phone 08-9326 0100
Fax 08-9326 0296

Project Reference: **PSI with Limited Investigation at Perth Airport**

Client: **Airservices Australia**

Drilling Contractor: XXXXXXXXXX

Project No.: **60543717**

Location: **Perth Airport, Western Australia**

Logged By: XXXXXXXXXX

Bore Size: **150 mm**

Relative Level: **mRL**

Drill Type: **Hand Auger**

Checked By: XXXXXX

Total Depth: **1.80 m**

Coordinates: **6467120.19 mN**

Drill Model: **Geoprobe**

Date Started: **12-9-17**

Casing Size: **mm**

402839.87 mE

Drill Fluid: **None**

Date Finished: **12-9-17**

Permit No: **N/A**

Method	Casing	Penetration			Ground Water Data and Comments	Depth (m)	Graphic Log	Classification	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), additional observations	Moisture Condition	Consistency	Relative Density	Sample Interval PID (ppm)	Sample ID
		S	M	H R										
						0		SW	loose, grey, coarse grained SAND, subangular.	D			0.2	SB1725_0.0_0.1
								SW	loose, light grey, coarse grained, well graded SAND, subangular, trace fines.	M			0.3	SB1725_0.1_0.5
								SW	loose, brown, coarse grained, well graded SAND, subangular, trace fines.	W			0.3	SB1725_0.8_1.0
						1							0.3	SB1725_1.3_1.5
									End of hole at target depth of 1.8 mbgl. No impacts observed throughout the soil profile.					

Remarks: APEC 4
Current Fire Station

Permit No: N/A

WELL CONSTRUCTION DETAILS

Diagram illustrating the wellhead assembly components:

- Gatic Cover
- Envirocap
- Concrete
- Bentonite
- Blank PVC Casing
- SWL = 2.0 mbtoc
- Level pack
- 50mm PVC Slotted Casing

Remarks: SB1701 converted to MW1701
APEC 6
Along Dunreath Drive

MONITORING WELL MW1702

AECOM, Level 6, 3 Forrest Place,
PERTH, WA, 6000

Phone 61 8 6208 0000
Fax 61 8 6208 0999

Drilling Contractor: XXXXXXXXXX

Logged By: XXXXXXXXXX

Checked By: XXXXXX

Date Started: **2-10-17**

Date Finished: **2-10-17**

Bore Size: **150 mm**

Total Depth: **4.00 m**

Casing Size: **mm**

Project Reference: **PSI with Limited Investigation at Perth Airport**

Project No.: **60543717**

Relative Level: **m TOC**

Coordinates: **6464669.70 mN**

401439.74 mE

Permit No: **N/A**

Client: **Airservices Australia**

Location: **Perth Airport, Western Australia**

PSI with Limited Investigation at Perth Airport

Drill Model: **Geoprobe** Drill Type: **Hand Auger 0 - 1.5m, Push Tube 1.5 - 4m**

Drill Fluid: **None**

Sample Depth	PID reading	Sample ID	Legend	Classification	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS
1.7		SB1702_0.0_0.1		SP	loose, brown coarse grained SAND, subrounded with organic matter. Grades to grey	D	0	Steel Riser
2.1		SB1702_0.1_0.5				D/M		Envirocap
2.1		SB1702_0.8_1.0						Concrete
2.3		SB1702_1.3_1.5						Bentonite seal
1.0		SB1702_1.8_2.0						50mm PVC Blank Casing
				SPG	red/brown, coarse grained, poorly graded gravelly SAND, subrounded.	M/W		SWL = 1.5 mbtoc
				SP	loose, brown coarse grained SAND, subrounded with organic matter.	W		Gravel pack
								50mm PVC Slotted Casing
					End of hole at target depth of 4.0 mbgl.	W		

Remarks: SB1702 converted to MW1702
APEC 6

MONITORING WELL MW1703

AECOM, Level 6, 3 Forrest Place,
PERTH, WA, 6000

Phone 61 8 6208 0000
Fax 61 8 6208 0999

Drilling Contractor: XXXXXXXXXX

Logged By: XXXXXXXXXX

Checked By: XXXXXX

Date Started: **2-10-17**

Date Finished: **2-10-17**

Bore Size: **150 mm**

Total Depth: **4.00 m**

Casing Size: **mm**

Project Reference: **PSI with Limited Investigation at Perth Airport**

Project No.: **60543717**

Relative Level: **m TOC**

Coordinates: **6464036.33 mN**

401415.78 mE

Permit No: **N/A**

Client: **Airservices Australia**

Location: **Perth Airport, Western Australia**

PSI with Limited Investigation at Perth Airport

Drill Model: **Geoprobe** Drill Type: **Hand Auger 0 - 1.5m,**

Push Tube 1.5 - 4m

Drill Fluid: **None**

Sample Depth	PID reading	Sample ID	Legend	Classification	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS
0.4		SB1709_0.0_0.1		OPSOIL	dark grey, coarse grained SAND, organic matter.		0	Steel Riser, Envirocap
0.8		SB1709_0.1_0.5		SP	loose, grey, coarse grained SAND, subangular to subrounded.	W		Concrete, Bentonite seal, 50mm PVC Blank Casing
1.3		SB1709_0.8_1.0				M		
1.6		SB1709_1.3_1.5						SWL = 1.6 mbtoc
1.4		SB1709_1.8_2.0						Gravel pack, 50mm PVC Slotted Casing
					End of hole at target depth of 4 mbgl.	W		

Remarks: SB1709 converted to MW1703
APEC 6

Drill Fluid: **None**

WELL CONSTRUCTION DETAILS

The diagram illustrates the vertical structure of a well. At the top, an **Envirocap** is shown. Below it is a **Steel Riser**. The well is filled with **Concrete** up to a certain level. Below the concrete is a **Bentonite seal**. The main body of the well is lined with **50mm PVC Blank Casing**. A **Gravel pack** is shown around the casing. The **SWL = 1.5 mbtoc** (Static Water Level = 1.5 meters below top of casing) is indicated. The bottom section of the well is lined with **50mm PVC Slotted Casing**.

WELL MELB 2 PERTH ASA LOGS.GPJ WCC AUS.GDT 21/11/17

MONITORING WELL MW1705

AECOM, Level 6, 3 Forrest Place,
PERTH, WA, 6000

Phone 61 8 6208 0000
Fax 61 8 6208 0999

Drilling Contractor: XXXXXXXXXX

Logged By: XXXXXXXXXX

Checked By: XXXXXX

Date Started: **12-9-17**

Date Finished: **12-9-17**

Bore Size: **150 mm**

Total Depth: **5.50 m**

Casing Size: **mm**

Project Reference: **PSI with Limited Investigation at Perth Airport**

Project No.: **60543717**

Relative Level: **m TOC**

Coordinates: **6466013.35 mN**

403323.56 mE

Permit No: **N/A**

Client: **Airservices Australia**

Location: **Perth Airport, Western Australia**

PSI with Limited Investigation at Perth Airport

Drill Model: **Geoprobe** Drill Type: **Direct Push**

Drill Fluid: **None**

Sample Depth
PID reading

Sample ID

Legend

Classification

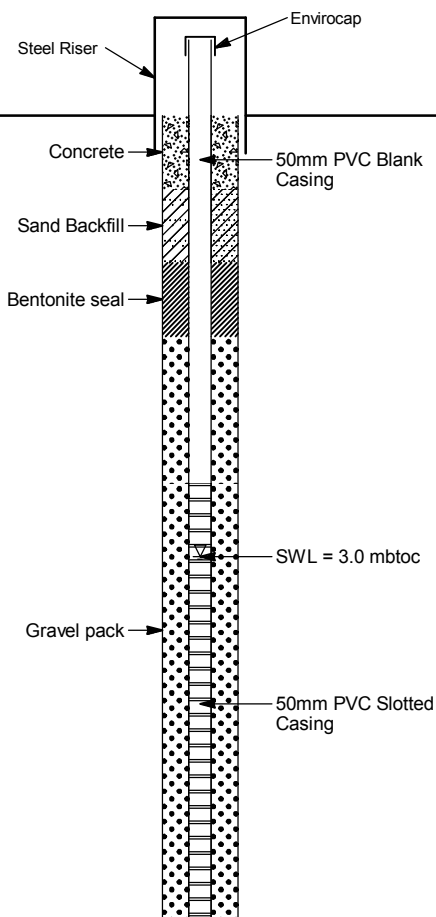
USC DESCRIPTION OF STRATA

Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations

Moisture

Depth (m)

WELL CONSTRUCTION DETAILS



0.0	SB1716_0.0_0.1	SP	loose, brown/grey, coarse grained SAND, subrounded with organic matter.	M	0
0.0	SB1716_0.1_0.5	SP	yellow/brown, coarse grained, poorly graded SAND, subrounded.		
0.1	SB1716_0.8_1.0	SPG	red/brown mottling, poorly graded SAND, minor gravel (<15%), 5-20mm.		
0.2	SB1716_1.3_1.5				
1.6	SB1716_1.8_2.0		dense, brown/grey, coarse grained, poorly graded SAND with clay, non-plastic, not cohesive.		
0.9	SB1716_2.3_2.5				
1.0	SB1716_2.8_3.0			W	
1.6	SB1716_3.3_3.5	SC	grey, coarse grained, non plastic clayey SAND, subrounded, minimal clay.		5
End of hole at target depth of 5.5 mbgl. No impacts observed throughout the soil profile.					

Remarks: SB1716 converted to MW1705
APEC 5
Former Fire Training Ground

MONITORING WELL MW1706

AECOM, Level 6, 3 Forrest Place,
PERTH, WA, 6000

Phone 61 8 6208 0000
Fax 61 8 6208 0999

Drilling Contractor: XXXXXXXXXX

Logged By: XXXXXXXXXX

Checked By: XXXXXX

Date Started: **12-9-17**

Date Finished: **12-9-17**

Bore Size: **150 mm**

Total Depth: **4.00 m**

Casing Size: **mm**

Project Reference: **PSI with Limited Investigation at Perth Airport**

Project No.: **60543717**

Relative Level: **m TOC**

Coordinates: **6467132.29 mN**

402766.83 mE

Permit No: **N/A**

Client: **Airservices Australia**

Location: **Perth Airport, Western Australia**

PSI with Limited Investigation at Perth Airport

Drill Model: **Geoprobe** Drill Type: **Hand Auger 0 - 1.5m, Push Tube 1.5 - 4m**

Drill Fluid: **None**

Sample Depth	PID reading	Sample ID	Legend	Classification	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations	Moisture	Depth (m)	WELL CONSTRUCTION DETAILS
1.3		SB1724_0.0_0.1		SW	grey/brown, well graded SAND, subangular, trace silt.	M	0	Steel Riser
0.6		SB1724_0.1_0.5		SW	yellow/brown, medium grained, well graded SAND, subangular, trace fines.	MW		Envirocap
0.4		SB1724_0.8_1.0						Concrete
0.7		SB1724_1.3_1.5						Bentonite seal
0.7		SB1724_1.8_2.0						50mm PVC Blank Casing
								SWL = 1.5 mbtoc
								Gravel pack
								50mm PVC Slotted Casing
					End of hole at target depth of 4.0 mbgl.			

Remarks: SB1724 converted to MW1706
APEC 4
Current Fire Station

MONITORING WELL MW1708

AECOM, Level 6, 3 Forrest Place,
PERTH, WA, 6000

Phone 61 8 6208 0000
Fax 61 8 6208 0999

Drilling Contractor: XXXXXXXXXX

Logged By: XXXXXXXXXX

Checked By: XXXXXX

Date Started: **3-10-17**

Date Finished: **3-10-17**

Bore Size: **150 mm**

Total Depth: **8.50 m**

Casing Size: **mm**

Project Reference: **PSI with Limited Investigation at Perth Airport**

Project No.: **60543717**

Relative Level: **m TOC**

Coordinates: **6467724.28 mN
403695.98 mE**

Permit No: **N/A**

Client: **Airservices Australia**

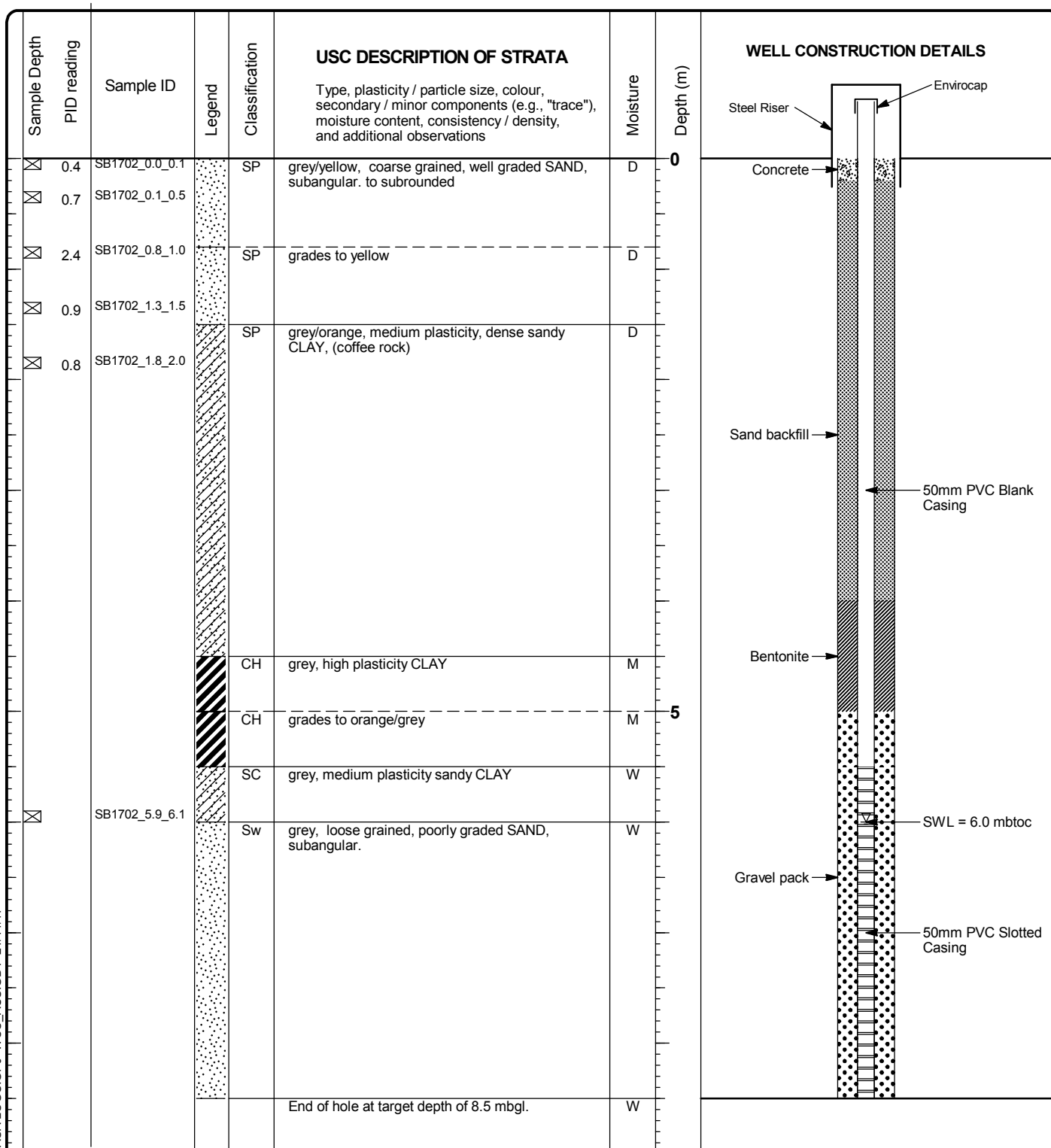
Location: **Perth Airport, Western Australia**

PSI with Limited Investigation at Perth Airport

Drill Model: **Geoprobe** Drill Type: **Direct Push**

Drill Fluid: **None**

WELL_MELB_2 PERTH ASA LOGS.GPJ WCC_AUS.GDT 21/11/17



Remarks: SB1702 converted to MW1708
APEC 3B

Appendix K

Survey Data



WESTERN AUSTRALIA

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Monitoring Well Survey

APEC Areas 3a, 4, 5, 6

Perth Airport

						Surveyed		05/12/17	Datum / Grid	MGA94 Zone50
						Drawn		13/12/17	Height Datum	AHD
						Approved		11/12/17	Based on PSMs	210, 224, 369, 978
0	13/12/17	Approved & Issued to Client	RB	RB	NK	Job No	Item No	Plan No	Rev	
Rev	Date	Description	Surveyor	Drawn	Approved	21802	- 000	- 022	- 00	

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WESTERN AUSTRALIA

DEVELOP
WITH
CONFIDENCE™

Aecom

Monitoring Well Report

APEC Areas 3a, 4, 5, 6

Perth Airport

						Surveyed		05/12/17	Datum / Grid	PCG94			
						Drawn		13/12/17	Height Datum	AHD			
						Approved		13/12/17	Based on PSMs 210, 224, 369, 978				
0	13/12/17	Approved & Issued to Client	RB	RB	NK	Job No					Item No	Plan No	Rev
Rev	Date	Description	Surveyor	Drawn	Approved	21802					- 000	- 024	- 00

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Appendix L

QAQC Tables

Field Duplicates (water)
Filter: ALL

	SW1722						SW1705					
Lab Report No.	EP1710035	EP1710035		562900		EP1710405	EP1710405		564136			
Field ID	SW1722_120917	WQA01_120917	RPD	QA02_1209	RPD	SW1705_200917	WQA03_200917	RPD	WQA04_200917	RPD		
Sample Type	Primary	Duplicate		Triplicate		Primary	Duplicate		Triplicate			
Sample Date	12-Sep-17	12-Sep-17		12-Sep-17		20-Sep-17	20-Sep-17		20-Sep-17			
LOR												
0.1 : 0.05 (Interlab)	<0.1	<0.1	0	<0.05	0	<0.1	<0.1	0	<0.05	0		
0.01 : 0.1 (Interlab)	7.08	6.87	3	6.99	1	0.64	0.62	3	0.58	10		
0.01 : 0.05 (Interlab)	6.88	6.68	3	6.81	1	0.64	0.6	6	0.56	13		
0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.01	0	<0.05	<0.05	0	<0.01	0		
0.02 : 0.05 (Interlab)	<0.02	<0.02	0	<0.05	0	<0.02	<0.02	0	<0.05	0		
0.02 : 0.01 (Interlab)	0.12	0.12	0	0.11	9	<0.02	0.02	0	0.02	0		
0.02 : 0.01 (Interlab)	0.08	0.07	13	0.07	13	<0.02	<0.02	0	<0.01	0		
0.02 : 0.01 (Interlab)	1.62	1.57	3	1.5	8	0.25	0.25	0	0.17	38		
0.02 : 0.05 (Interlab)	<0.02	<0.02	0	<0.05	0	<0.02	<0.02	0	<0.05	0		
20	<20	<20	0	<20	0	<20	<20	0	<20	0		
20	<20	<20	0	<20	0	<20	<20	0	<20	0		
100 : 50 (Interlab)	<100	<100	0	<50	0	<100	<100	0	<100	0		
100 : 50 (Interlab)	<100	<100	0	<50	0	<100	<100	0	<100	0		
100	270	200	30	<100	92	<100	<100	0	<100	0		
100	<100	<100	0	<100	0	<100	<100	0	<100	0		
100	270	200	30	-	-	<100	<100	0	<100	0		
1	<1	<1	0	<1	0	<1	<1	0	<1	0		
2 : 1 (Interlab)	<2	<2	0	<1	0	<2	<2	0	<1	0		
2 : 1 (Interlab)	<2	<2	0	<1	0	<2	<2	0	<1	0		
2	<2	<2	0	<2	0	<2	<2	0	<2	0		
2 : 1 (Interlab)	<2	<2	0	<1	0	<2	<2	0	<1	0		
2 : 3 (Interlab)	<2	<2	0	<3	0	<2	<2	0	<3	0		
1	<1	<1	0	-	-	<1	<1	0				
5 : 10 (Interlab)	<5	<5	0	<10	0	<5	<5	0	<10	0		
0.05	<0.05	<0.05	0	<0.05	0	<0.05	<0.05	0	<0.05	0		
0.01	0.13	0.14	7	0.09	36	0.02	0.01	67	0.01	67		
0.01	4.62	4.47	3	4.8	4	0.34	0.31	9	0.34	0		
0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.01	0	<0.05	<0.05	0	<0.01	0		
0.02 : 0.01 (Interlab)	0.06	0.06	0	0.07	15	<0.02	<0.02	0	<0.01	0		
0.01	6.24	6.04	3	6.3	1	0.59	0.56	5	0.51	15		
0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.01	0	<0.05	<0.05	0	<0.01	0		
0.05	<0.05	<0.05	0	<0.05	0	<0.05	<0.05	0	<0.05	0		
0.05	<0.05	<0.05	0	<0.05	0	<0.05	<0.05	0	<0.05	0		
0.02 : 0.05 (Interlab)	<0.02	<0.02	0	<0.05	0	<0.02	<0.02	0	<0.05	0		
0.02 : 0.01 (Interlab)	0.08	0.08	0	0.08	0	<0.02	<0.02	0	0.02	0		
0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.01	0	<0.02	<0.02	0	<0.01	0		
0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.01	0	<0.05	<0.05	0	<0.01	0		
0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.01	0	<0.02	<0.02	0	<0.01	0		
0.05	<0.05	<0.05	0	<0.05	0	<0.05	<0.05	0	<0.05	0		
0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.01	0	<0.02	<0.02	0	<0.01	0		
0.02 : 0.01 (Interlab)	0.06	0.06	0	0.04	40	<0.02	<0.02	0	<0.01	0		
0.02 : 0.01 (Interlab)	0.31	0.3	3	0.23	30	0.03	0.03	0	0.02	40		
0.05	<0.05	<0.05	0	<0.05	0	<0.05	<0.05	0	<0.05	0		
0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.01	0	<0.02	<0.02	0	<0.01	0		
0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.01	0	<0.02	<0.02	0	<0.01	0		
0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.01	0	<0.02	<0.02	0	<0.01	0		

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 30 (1-10 x EQL); 30 (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

Field Duplicates (water)
Filter: ALL

		MW0180						MW1706						MW37					
Lab Report No.		EP1711070	EP1711070		566735			EP1711070	EP1711070		566735			EP1711196	EP1711196		566796		
Field ID		MW0180_031017	WQA01_031017	RPD	WQA02_031017	RPD		MW1706_041017	WQA05_031017	RPD	QA06_0410	RPD		W37_091017	QA16_0910	RPD	WQA17_091017	RPD	
Sample Type		Primary	Duplicate		Triplicate			Primary	Duplicate		Triplicate			Primary	Duplicate		Triplicate		
Sample Date		04-Oct-17	04-Oct-17		04-Oct-17			04-Oct-17	04-Oct-17		04-Oct-17			09-Oct-17	09-Oct-17		09-Oct-17		
ICOPC	Units	LOR																	
EW LEED MA 1523																			
Perfluorobutanoic acid	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	0	<0.05	0	<0.1	<0.1	0	<0.05	0	<0.1	<0.1	0	<0.05	0		
Per- and Polyfluoroalkyl Subst																			
Sum of PFAS	µg/L	0.01 : 0.1 (Interlab)	2.45	2.37	3	1.87	27	0.08	0.08	0	<0.1	0	0.68	0.61	11	0.54	23		
Sum of PFAS (WA DER List)	µg/L	0.01 : 0.05 (Interlab)	2.23	2.18	2	1.73	25	0.08	0.08	0	0.05	46	0.64	0.61	5	0.5	25		
10:2 FTS	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.01	0	<0.05	<0.05	0	<0.01	0	<0.05	<0.05	0	<0.01	0		
MeFOSAA	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.02	0	<0.05	0	<0.02	<0.02	0	<0.05	0	<0.02	<0.02	0	<0.05	0		
PFPeS	µg/L	0.02 : 0.01 (Interlab)	0.2	0.19	5	0.11	58	<0.02	<0.02	0	<0.01	0	0.02	<0.02	0	0.02	0		
PFHpS	µg/L	0.02 : 0.01 (Interlab)	0.02	<0.02	0	0.03	40	<0.02	<0.02	0	<0.01	0	0.02	<0.02	0	0.02	0		
PFHxS	µg/L	0.02 : 0.01 (Interlab)	1.32	1.25	5	0.94	34	0.05	0.04	22	0.02	86	0.33	0.34	3	0.19	54		
EIFOSAA	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.02	0	<0.05	0	<0.02	<0.02	0	<0.05	0	<0.02	<0.02	0	<0.05	0		
Total Recoverable Hydrocarbons																			
C6-C10 fraction	µg/L	20	<20	<20	0	<20	0	<20	<20	0	<20	0	<20	<20	0	<20	0		
C6-C10 fraction (minus BTEX)(F1)	µg/L	20	<20	<20	0	<20	0	<20	<20	0	<20	0	<20	<20	0	<20	0		
>C10-C16 fraction	µg/L	100 : 50 (Interlab)	<100	<100	0	<50	0	<100	<100	0	<50	0	<100	<100	0	<50	0		
>C10-C16 (minus Naphthalene)(F2)	µg/L	100 : 50 (Interlab)	<100	<100	0	<50	0	<100	<100	0	<50	0	<100	<100	0	<50	0		
>C16-C34 fraction	µg/L	100	<100	<100	0	<100	0	<100	<100	0	<100	0	<100	<100	0	<100	0		
>C34-C40 fraction	µg/L	100	<100	<100	0	<100	0	<100	<100	0	<100	0	<100	<100	0	<100	0		
>C10-C40 fraction (sum)	µg/L	100	<100	<100	0	-	-	<100	<100	0	-	-	<100	<100	0	-	-		
Monocyclic Aromatic Hydrocarbons																			
Benzene	µg/L	1	<1	<1	0	<1	0	<1	<1	0	<1	0	<1	<1	0	<1	0		
Toluene	µg/L	2 : 1 (Interlab)	<2	<2	0	<1	0	<2	<2	0	<1	0	<2	<2	0	<1	0		
Ethylbenzene	µg/L	2 : 1 (Interlab)	<2	<2	0	<1	0	<2	<2	0	<1	0	<2	<2	0	<1	0		
m&p-Xylene	µg/L	2	<2	<2	0	<2	0	<2	<2	0	<2	0	<2	<2	0	<2	0		
o-Xylene	µg/L	2 : 1 (Interlab)	<2	<2	0	<1	0	<2	<2	0	<1	0	<2	<2	0	<1	0		
Total Xylenes	µg/L	2 : 3 (Interlab)	<2	<2	0	<2	0	<2	<2	0	<3	0	<2	<2	0	<3	0		
Total BTEX	µg/L	1	<1	<1	0	-	-	<1	<1	0	-	-	<1	<1	0	-	-		
Naphthalene																			
Naphthalene (VOC)	µg/L	5 : 10 (Interlab)	<5	<5	0	<10	0	<5	<5	0	<10	0	<5	<5	0	<10	0		
Surfactants																			
6:2 FTS	µg/L	0.05	<0.05	<0.05	0	<0.05	0	<0.05	<0.05	0	<0.05	0	<0.05	<0.05	0	<0.05	0		
PFOA	µg/L	0.01	0.04	0.04	0	0.04	0	<0.01	<0.01	0	<0.01	0	0.04	0.04	0	0.03	29		
PFOS	µg/L	0.01	0.43	0.45	5	0.43	0	<0.01	<0.01	0	0.01	0	0.21	0.18	15	0.2	5		
Organic																			
14:2 FTS	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.01	0	<0.05	<0.05	0	<0.01	0	<0.05	<0.05	0	<0.01	0		
PFPeA	µg/L	0.02 : 0.01 (Interlab)	0.03	0.03	0	0.04	29	<0.02	<0.02	0	0.01	0	<0.02	<0.02	0	0.02	0		
Sum (PFHxS + PFOS)	µg/L	0.01	1.75	1.7	3	1.37	24	0.05	0.04	22	0.03	50	0.54	0.52	4	0.39	32		
Perfluorinated Compounds (PFCs)																			
8:2 FTS	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.01	0	<0.05	<0.05	0	<0.01	0	<0.05	<0.05	0	<0.01	0		
N-Me-FOSA	µg/L	0.05	<0.05	<0.05	0	<0.05	0	<0.05	<0.05	0	<0.05	0	<0.05	<0.05	0	<0.05	0		
N-Me-FOSE	µg/L	0.05	<0.05	<0.05	0	<0.05	0	<0.05	<0.05	0	<0.05	0	<0.05	<0.05	0	<0.05	0		
FOSA	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.02	0	<0.05	0	<0.02	<0.02	0	<0.05	0	<0.02	<0.02	0	<0.05	0		
PFBS	µg/L	0.02 : 0.01 (Interlab)	0.17	0.17	0	0.12	34	<0.02	<0.02	0	<0.01	0	<0.02	<0.02	0	0.02	0		
PFDS	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.01	0	<0.02	<0.02	0	<0.01	0	<0.02	<0.02	0	<0.01	0		
PFTeDA	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.01	0	<0.05	<0.05	0	<0.01	0	<0.05	<0.05	0	<0.01	0		
PFTDA	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.01	0	<0.02	<0.02	0	<0.01	0	<0.02	<0.02	0	<0.01	0		
N-Et-FOSA	µg/L	0.05	<0.05	<0.05	0	<0.05	0	<0.05	<0.05	0	<0.05	0	<0.05	<0.05	0	<0.05	0		
PFDA	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.01	0	<0.02	<0.02	0	<0.01	0	<0.02	<0.02	0	<0.01	0		
PFHxA	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	0.03	40	<0.02	<0.02	0	0.01	0	<0.02	<0.02	0	0.01	0		
PFHxA	µg/L	0.02 : 0.01 (Interlab)	0.24	0.24	0	0.13	59	0.03	0.04	29	<0.01	100	0.06	0.05	18	0.03	67		
N-Et-FOSE	µg/L	0.05	<0.05	<0.05	0	<0.05	0	<0.05	<0.05	0	<0.05	0	<0.05	<0.05	0	<0.05	0		
PFDoA	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.01	0	<0.02	<0.02	0	<0.01	0	<0.02	<0.02	0	<0.01	0		
PFNA	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.01	0	<0.02	<0.02	0	<0.01	0	<0.02	<0.02	0	<0.01	0		
PFUnA	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.01	0	<0.02	<0.02	0	<0.01	0	<0.02	<0.02	0	<0.01	0		

*RPDs have only been considered where a concentration is greater than 1 tir

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are:

***Interlab Duplicates are matched on a per compound basis as methods vary

	MW0135				MW1708				MW1705					
Lab Report No.	EP1711644		EP1711644		EP1711644		EP1711644		EP1711124		566601		564136	
Field ID	0135_171QA01_1710		568454		MW1708_171017		WQA07_181017		MW1705_061017		QA12_0610		WQA04_200917	
Sample Type	Primary Duplicate		TriPLICATE		Primary		Duplicate		Primary		TriPLICATE		TriPLICATE	
Sample Date	17-Oct-17 17-Oct-17		17-Oct-17		17-Oct-17		17-Oct-17		06-Oct-17		06-Oct-17		20-Sep-17	

***Interlab Duplicates are matched on a per compound basis as methods vary

Field Duplicates (SOL Rbr: ALL)	Lab Report No.	SB1736				SB1724				SB1702			
		EP1710035	EP1710035		562900	EP1710035	EP1710035		562900	EP1710035	EP1710035		
		SB1736_01_05	SQA02_120917	RPD	SQA02_120917	RPD	SB1724_01_05	SQA06_120917	RPD	SQA05_120917	RPD	SB1702_021017 0.0-0.1	SQA15_081017
		Primary	Duplicate		Duplicate		Primary	Duplicate		TriPLICATE		Primary	Duplicate
		Sample Type	Sample Date		Sample Date		Sample Type	Sample Date		Sample Type	Sample Date	Sample Type	Sample Date
			12-Sep-17		12-Sep-17			12-Sep-17			12-Sep-17	02-Oct-17	02-Oct-17

COPC	Units	LOR											
Per- and Polyfluoralkyl Subst													
Sum of P	mg/kg	0.0002 - 0.05 (Interlab)	0.0004	0.0006	24	<0.05	0	0.0003	0.0006	67	<0.05	0	0.0004
Sum of P	mg/kg	0.0002 - 0.01 (Interlab)	0.0004	0.0006	24	0.015	56	0.0003	0.0006	67	<0.01	0	0.0004
Σ2 FTS	mg/kg	0.0005 - 0.005 (Interlab)	<0.0005	<0.0005	0	<0.005	0	<0.0005	<0.0005	0	<0.005	0	<0.0005
NMeFOA	mg/kg	0.0002 - 0.01 (Interlab)	<0.0002	<0.0002	0	<0.01	0	<0.0002	<0.0002	0	<0.01	0	<0.0002
PFPeS	mg/kg	0.0002 - 0.005 (Interlab)	<0.0002	<0.0002	0	<0.005	0	<0.0002	<0.0002	0	<0.005	0	<0.0002
PFHpS	mg/kg	0.0002 - 0.005 (Interlab)	<0.0002	<0.0002	0	<0.005	0	<0.0002	<0.0002	0	<0.005	0	<0.0002
PFHxS	mg/kg	0.0002 - 0.005 (Interlab)	<0.0002	<0.0002	0	<0.005	0	<0.0002	<0.0002	0	<0.005	0	<0.0002
PFOS	mg/kg	0.0002 - 0.01 (Interlab)	<0.0002	<0.0002	0	<0.01	0	<0.0002	<0.0002	0	<0.01	0	<0.0002
Total Recoverable Hydrocarbons													
C6C10H	mg/kg	10 - 20 (Interlab)	<10	<10	0	<20	0	<10	<10	0	<20	0	<10
C6C10H	mg/kg	10 - 20 (Interlab)	<10	<10	0	<20	0	<10	<10	0	<20	0	<10
C10C14	mg/kg	50	<50	<50	0	<50	0	<50	<50	0	<50	0	<50
C10C14	mg/kg	50	<50	<50	0	<50	0	<50	<50	0	<50	0	<50
C16C20	mg/kg	100	<100	<100	0	<100	0	<100	<100	0	<100	0	<100
C34C40	mg/kg	100	<100	<100	0	<100	0	<100	<100	0	<100	0	<100
C10C14	mg/kg	50	<50	<50	0	<50	0	<50	<50	0	<50	0	<50
Monocyclic Aromatic Hydrocarbons													
Benzene	mg/kg	0.2 - 0.1 (Interlab)	<0.2	<0.2	0	<0.1	0	<0.2	<0.2	0	<0.1	0	<0.2
Toluene	mg/kg	0.5 - 0.1 (Interlab)	<0.5	<0.5	0	<0.1	0	<0.5	<0.5	0	<0.1	0	<0.5
Ethylbenz	mg/kg	0.5 - 0.1 (Interlab)	<0.5	<0.5	0	<0.1	0	<0.5	<0.5	0	<0.1	0	<0.5
m,p-Xyl	mg/kg	0.5 - 0.2 (Interlab)	<0.5	<0.5	0	<0.2	0	<0.5	<0.5	0	<0.2	0	<0.5
o-Xylene	mg/kg	0.5 - 0.1 (Interlab)	<0.5	<0.5	0	<0.1	0	<0.5	<0.5	0	<0.1	0	<0.5
Total Xyl	mg/kg	0.5 - 0.2 (Interlab)	<0.5	<0.5	0	<0.2	0	<0.5	<0.5	0	<0.2	0	<0.5
Total BTE	mg/kg	0.2	<0.2	<0.2	0	-	-	<0.2	<0.2	0	-	-	<0.2
Naphthalene													
Naphthal	mg/kg	1 - 0.5 (Interlab)	<1	<1	0	<0.5	0	<1	<1	0	<0.5	0	<1
Physico-Chemical Parameters													
Moisture (%)	1		6.5	7.7	17	6.9	6	2.9	3.2	10	2.6	11	5
Surfactants													
Σ2 FTS	mg/kg	0.0005 - 0.01 (Interlab)	<0.0005	<0.0005	0	<0.01	0	<0.0005	<0.0005	0	<0.01	0	<0.0005
PFCA	mg/kg	0.0002 - 0.005 (Interlab)	<0.0002	<0.0002	0	<0.005	0	<0.0002	<0.0002	0	<0.005	0	<0.0002
Antonie S	mg/kg	1											
PFOS	mg/kg	0.0002 - 0.005 (Interlab)	0.0004	0.0006	24	0.015	56	0.0003	0.0006	67	<0.005	0	0.0004
Organic													
Σ2 FTS	mg/kg	0.0005 - 0.005 (Interlab)	<0.0005	<0.0005	0	<0.005	0	<0.0005	<0.0005	0	<0.005	0	<0.0005
PFPeA	mg/kg	0.0002 - 0.005 (Interlab)	<0.0002	<0.0002	0	<0.005	0	<0.0002	<0.0002	0	<0.005	0	<0.0002
Sum (PFUGKKG)	0.2 - 5 (Interlab)		8.4	6.6	24	15	56	0.3	0.6	67	<5	0	0.4
Perfluorinated Compounds (PFCS)													
Σ2 FTS	mg/kg	0.0005 - 0.005 (Interlab)	<0.0005	<0.0005	0	<0.005	0	<0.0005	<0.0005	0	<0.005	0	<0.0005
NMeFOA	mg/kg	0.0005 - 0.005 (Interlab)	<0.0005	<0.0005	0	<0.005	0	<0.0005	<0.0005	0	<0.005	0	<0.0005
NMeFOA	mg/kg	0.0005 - 0.005 (Interlab)	<0.0005	<0.0005	0	<0.005	0	<0.0005	<0.0005	0	<0.005	0	<0.0005
FOA	mg/kg	0.0002 - 0.005 (Interlab)	<0.0002	<0.0002	0	<0.005	0	<0.0002	<0.0002	0	<0.005	0	<0.0002
PFBS	mg/kg	0.0002 - 0.005 (Interlab)	<0.0002	<0.0002	0	<0.005	0	<0.0002	<0.0002	0	<0.005	0	<0.0002
PFDS	mg/kg	0.0002 - 0.005 (Interlab)	<0.0002	<0.0002	0	<0.005	0	<0.0002	<0.0002	0	<0.005	0	<0.0002
PFTeDA	mg/kg	0.0005 - 0.005 (Interlab)	<0.0005	<0.0005	0	<0.005	0	<0.0005	<0.0005	0	<0.005	0	<0.0005
PFHDA	mg/kg	0.0002 - 0.005 (Interlab)	<0.0002	<0.0002	0	<0.005	0	<0.0002	<0.0002	0	<0.005	0	<0.0002
NEtPFOS	mg/kg	0.0005 - 0.005 (Interlab)	<0.0005	<0.0005	0	<0.005	0	<0.0005	<0.0005	0	<0.005	0	<0.0005
PFDA	mg/kg	0.0002 - 0.005 (Interlab)	<0.0002	<0.0002	0	<0.005	0	<0.0002	<0.0002	0	<0.005	0	<0.0002
PFHpA	mg/kg	0.0002 - 0.005 (Interlab)	<0.0002	<0.0002	0	<0.005	0	<0.0002	<0.0002	0	<0.005	0	<0.0002
PFHxA	mg/kg	0.0002 - 0.005 (Interlab)	<0.0002	<0.0002	0	<0.005	0	<0.0002	<0.0002	0	<0.005	0	<0.0002
NEtPFOS	mg/kg	0.0005 - 0.005 (Interlab)	<0.0005	<0.0005	0	<0.005	0	<0.0005	<0.0005	0	<0.005	0	<0.0005
PFDoA	mg/kg	0.0002 - 0.005 (Interlab)	<0.0002	<0.0002	0	<0.005	0	<0.0002	<0.0002	0	<0.005	0	<0.0002
PFNA	mg/kg	0.0002 - 0.005 (Interlab)	<0.0002	<0.0002	0	<0.005	0	<0.0002	<0.0002	0	<0.005	0	<0.0002
PFUnA	mg/kg	0.0002 - 0.005 (Interlab)	<0.0002	<0.0002	0	<0.005	0	<0.0002	<0.0002	0	<0.005	0	<0.0002

*RPDs have only been considered where a concentration is greater than 1 times the EQL

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are 30 (1-10 x EQL), 30 (10-30 x EQL), 30 (> 30 x EQL))

*** Interlab Duplicate cases 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 M

Laboratory
Documentation

CHAIN OF CUSTODY DOCUMENTATION						 ALS Laboratory Group															
CLIENT: AECOM						SAMPLER: [REDACTED]															
ADDRESS / OFFICE: PERTH						MOBILE: [REDACTED]															
PROJECT MANAGER (PM): [REDACTED]						PHONE: [REDACTED]															
PROJECT ID: 60543717						EMAIL REPORT TO: [REDACTED] @AECOM.COM															
SITE: Perth Airport Limited DSI						P.O. NO.: 60543717.1.3															
RESULTS REQUIRED (Date):						QUOTE NO 60543717.1.3															
FOR LABORATORY USE ONLY						ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)															
COOLER SEAL (circle appropriate)						COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:															
Intact: Yes No N/A																					
SAMPLE TEMPERATURE																					
CHILLED: Yes No																					
SAMPLE INFORMATION (note: S = Soil, W=Water)						CONTAINER INFORMATION															
ALS ID						SAMPLE ID						MATRIX		DATE		Time		Type / Code		Total bottles	
1						ONW6-191017															
2						MW1701-191017															
3						MW1703-181017															
4						MW0216-181017															
5						MW0179-181017															
6						MW0179D-181017															
7						MW0120N-171017															
8						MW1708-171017															
9						MW0135-171017															
10						WQA01-171017															
11						WQA03-171017															
12						WQA04-171017															
13						WQA05-181017															
14						WQA06-181017															
15						WQA07-181017															
16						WQA09-191017															
17						WQA10-191017															
18						WQA11-191017															
RELINQUISHED BY:						RECEIVED BY						METHOD OF SHIPMENT									
Name: [REDACTED]						Name: [REDACTED]						Con' Note No:									
Date: 19-10-17						Date: 19/10/17						Transport Co:									
Of: [REDACTED]						Of: ALS						Time: 1240									
Name:						Name:						Time:									
Of:						Of:						Time:									
Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; T = Zinc Aspartate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.																					

CERTIFICATE OF ANALYSIS

Work Order : EP1711644
Client : AECOM Australia Pty Ltd
Contact : [REDACTED]
Address : LEVEL 6 3 FORREST PLACE
 PERTH WA, AUSTRALIA 6849
Telephone : +61 02 8934 0000
Project : 60543717 Perth Airport Limited DSI
Order number : 60543717.1.3
C-O-C number : ----
Sampler : [REDACTED]
Site : ----
Quote number : EN/004/16
No. of samples received : 18
No. of samples analysed : 18

Page : 1 of 13
Laboratory : Environmental Division Perth
Contact : [REDACTED]
Address : 10 Hod Way Malaga WA Australia 6090
Telephone : +61-8-9209 7655
Date Samples Received : 19-Oct-2017 12:40
Date Analysis Commenced : 24-Oct-2017
Issue Date : 27-Oct-2017 14:44



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
[REDACTED]	Organic Chemist	Sydney Organics, Smithfield, NSW
[REDACTED]	SENIOR LAB TECH	Perth Organics, Malaga, WA
[REDACTED]	Graduate Chemist	Perth Organics, Malaga, WA



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.

- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				ONW6_191017	MW1701_191017	MW1703_181017	MW0216_181017	MW0179_181017
Client sampling date / time				19-Oct-2017 00:00	19-Oct-2017 00:00	18-Oct-2017 00:00	18-Oct-2017 00:00	18-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1711644-001	EP1711644-002	EP1711644-003	EP1711644-004	EP1711644-005
				Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.05	37.4	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.06	0.06	44.4	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.06	0.57	0.52	396	0.17
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.02	<0.02	28.3	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.35	0.16	1.43	826	0.32

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	ONW6_191017	MW1701_191017	MW1703_181017	MW0216_181017	MW0179_181017
Client sampling date / time				19-Oct-2017 00:00	19-Oct-2017 00:00	18-Oct-2017 00:00	18-Oct-2017 00:00	18-Oct-2017 00:00	
Compound	CAS Number	LOR	Unit	EP1711644-001	EP1711644-002	EP1711644-003	EP1711644-004	EP1711644-005	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	6.5	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	23.5	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.04	0.06	0.06	175	0.06	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.04	<0.02	33.0	0.03	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.01	<0.01	74.5	0.05	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	2.70	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Client sample ID

				ONW6_191017	MW1701_191017	MW1703_181017	MW0216_181017	MW0179_181017
Client sampling date / time				19-Oct-2017 00:00	19-Oct-2017 00:00	18-Oct-2017 00:00	18-Oct-2017 00:00	18-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1711644-001	EP1711644-002	EP1711644-003	EP1711644-004	EP1711644-005
				Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	1.98	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	0.45	0.92	2.12	1650	0.63
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.41	0.73	1.95	1220	0.49
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.45	0.84	2.06	1570	0.63
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	2	%	110	114	109	96.2	97.2
Toluene-D8	2037-26-5	2	%	99.2	99.1	102	105	103
4-Bromofluorobenzene	460-00-4	2	%	100	101	98.9	104	105
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	91.5	85.6	88.2	79.1	82.8
13C8-PFOA	----	0.02	%	115	111	111	115	90.1



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				MW0179D_181017	MW0120N_171017	MW1708_171017	MW0135_171017	WQA01_171017
Client sampling date / time				18-Oct-2017 00:00	17-Oct-2017 00:00	17-Oct-2017 00:00	17-Oct-2017 00:00	17-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1711644-006	EP1711644-007	EP1711644-008	EP1711644-009	EP1711644-010
				Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.79	<0.02	21.3	0.04	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	1.07	<0.02	21.4	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	7.39	0.06	111	0.16	0.19
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.18	<0.02	2.97	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	14.1	0.09	7.40	0.04	0.06



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				MW0179D_181017	MW0120N_171017	MW1708_171017	MW0135_171017	WQA01_171017
Client sampling date / time				18-Oct-2017 00:00	17-Oct-2017 00:00	17-Oct-2017 00:00	17-Oct-2017 00:00	17-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1711644-006	EP1711644-007	EP1711644-008	EP1711644-009	EP1711644-010
				Result	Result	Result	Result	Result

EP231A: Perfluoroalkyl Sulfonic Acids - Continued

Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
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EP231B: Perfluoroalkyl Carboxylic Acids

Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	1.7	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.34	<0.02	5.81	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.38	<0.02	40.3	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.18	<0.02	5.90	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.38	<0.01	10.5	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05

EP231C: Perfluoroalkyl Sulfonamides

Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02

EP231D: (n:2) Fluorotelomer Sulfonic Acids



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	MW0179D_181017	MW0120N_171017	MW1708_171017	MW0135_171017	WQA01_171017
Client sampling date / time					18-Oct-2017 00:00	17-Oct-2017 00:00	17-Oct-2017 00:00	17-Oct-2017 00:00	17-Oct-2017 00:00
Compound	CAS Number	LOR	Unit		EP1711644-006	EP1711644-007	EP1711644-008	EP1711644-009	EP1711644-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	0.40	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		25.8	0.15	229	0.24	0.25
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		21.5	0.15	118	0.20	0.25
Sum of PFAS (WA DER List)	----	0.01	µg/L		24.6	0.15	204	0.24	0.25
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%		99.1	98.8	102	102	103
Toluene-D8	2037-26-5	2	%		102	102	102	103	102
4-Bromofluorobenzene	460-00-4	2	%		104	106	104	102	102
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		85.0	83.8	91.4	82.4	90.0
13C8-PFOA	----	0.02	%		95.6	84.2	96.9	90.6	98.5



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQA03_171017	WQA04_171017	WQA05_181017	WQA06_171017	WQA07_181017
Client sampling date / time					17-Oct-2017 00:00	17-Oct-2017 00:00	18-Oct-2017 00:00	17-Oct-2017 00:00	18-Oct-2017 00:00
Compound	CAS Number	LOR	Unit		EP1711644-011	EP1711644-012	EP1711644-013	EP1711644-014	EP1711644-015
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	190
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	190
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	210
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	210
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	<100
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		----	----	----	----	0.04
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		----	----	----	----	0.06
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		----	----	----	----	0.55
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		----	----	----	----	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		----	----	----	----	1.43

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQA03_171017	WQA04_171017	WQA05_181017	WQA06_171017	WQA07_181017
Client sampling date / time				17-Oct-2017 00:00	17-Oct-2017 00:00	18-Oct-2017 00:00	17-Oct-2017 00:00	18-Oct-2017 00:00	
Compound	CAS Number	LOR	Unit	EP1711644-011	EP1711644-012	EP1711644-013	EP1711644-014	EP1711644-015	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	----	----	----	----	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	----	----	----	----	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	----	----	----	----	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	----	----	----	----	0.08	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	----	----	----	----	0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	----	----	----	----	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	----	----	----	----	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	----	----	----	----	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	----	----	----	----	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	----	----	----	----	<0.02	
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	----	----	----	----	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	----	----	----	----	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	----	----	----	----	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	----	----	----	----	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	----	----	----	----	<0.05	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	----	----	----	----	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	----	----	----	----	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	----	----	----	----	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	----	----	----	----	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Client sample ID

				WQA03_171017	WQA04_171017	WQA05_181017	WQA06_171017	WQA07_181017
Client sampling date / time				17-Oct-2017 00:00	17-Oct-2017 00:00	18-Oct-2017 00:00	17-Oct-2017 00:00	18-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1711644-011	EP1711644-012	EP1711644-013	EP1711644-014	EP1711644-015
				Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	----	----	----	----	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	----	----	----	----	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	----	----	----	----	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	----	----	----	----	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	----	----	----	----	2.18
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	----	----	----	----	1.98
Sum of PFAS (WA DER List)	----	0.01	µg/L	----	----	----	----	2.12
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	2	%	104	102	105	105	109
Toluene-D8	2037-26-5	2	%	102	103	102	102	101
4-Bromofluorobenzene	460-00-4	2	%	102	101	100	101	98.1
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	----	----	----	----	82.6
13C8-PFOA	----	0.02	%	----	----	----	----	107



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQA09_191017	WQA10_191017	WQA11_191017	----	----
Client sampling date / time					19-Oct-2017 00:00	19-Oct-2017 00:00	19-Oct-2017 00:00	----	----
Compound	CAS Number	LOR	Unit		EP1711644-016	EP1711644-017	EP1711644-018	-----	-----
				Result	Result	Result	Result	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	----	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	----	----
Toluene	108-88-3	2	µg/L		<2	<2	<2	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	----	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%		105	107	106	----	----
Toluene-D8	2037-26-5	2	%		102	101	103	----	----
4-Bromofluorobenzene	460-00-4	2	%		99.3	99.9	100	----	----



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	61	141
Toluene-D8	2037-26-5	73	126
4-Bromofluorobenzene	460-00-4	60	125
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	130
13C8-PFOA	----	60	130

QUALITY CONTROL REPORT

Work Order	: EP17111644	Page	: 1 of 9
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Perth
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: LEVEL 6 3 FORREST PLACE PERTH WA, AUSTRALIA 6849	Address	: 10 Hod Way Malaga WA Australia 6090
Telephone	: +61 02 8934 0000	Telephone	: +61-8-9209 7655
Project	: 60543717 Perth Airport Limited DSI	Date Samples Received	: 19-Oct-2017
Order number	: 60543717.1.3	Date Analysis Commenced	: 24-Oct-2017
C-O-C number	: ----	Issue Date	: 27-Oct-2017
Sampler	: [REDACTED]		
Site	: ----		
Quote number	: EN/004/16		
No. of samples received	: 18		
No. of samples analysed	: 18		



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
[REDACTED]	Organic Chemist	Sydney Organics, Smithfield, NSW
[REDACTED]	SENIOR LAB TECH	Perth Organics, Malaga, WA
[REDACTED]	Graduate Chemist	Perth Organics, Malaga, WA



General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1188026)									
EP1711644-004	MW0216_181017	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EP1711644-006	MW0179D_181017	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1192863)									
EP1711644-004	MW0216_181017	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP1711644-011	WQA03_171017	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1188026)									
EP1711644-004	MW0216_181017	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP1711644-006	MW0179D_181017	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1192863)									
EP1711644-004	MW0216_181017	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP1711644-011	WQA03_171017	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 1192863)									
EP1711644-004	MW0216_181017	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 1192863) - continued									
EP1711644-004	MW0216_181017	EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
EP1711644-011	WQA03_171017	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit	
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1188960)									
EP1711644-001	ONW6_191017	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.35	0.34	0.00	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.06	0.07	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP1711644-015	WQA07_181017	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.43	1.69	17.1	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.04	0.05	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.06	0.06	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.55	0.62	12.2	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1188960)									
EP1711644-001	ONW6_191017	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.04	0.07	65.4	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
EP1711644-015	WQA07_181017	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.08	0.09	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.02	0.03	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1188960) - continued									
EP1711644-015	WQA07_181017	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1188960)									
EP1711644-001	ONW6_191017	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP1711644-015	WQA07_181017	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1188960)									
EP1711644-001	ONW6_191017	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit

Page : 5 of 9
 Work Order : EP1711644
 Client : AECOM Australia Pty Ltd
 Project : 60543717 Perth Airport Limited DSI



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1188960) - continued									
EP1711644-001	ONW6_191017	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP1711644-015	WQA07_181017	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 1188960)									
EP1711644-001	ONW6_191017	EP231X: Sum of PFAS	----	0.01	µg/L	0.45	0.48	6.45	0% - 20%
EP1711644-015	WQA07_181017	EP231X: Sum of PFAS	----	0.01	µg/L	2.18	2.54	15.2	0% - 20%



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

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1188026)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	385 µg/L	62.0	35	95
EP071: C15 - C28 Fraction	----	100	µg/L	<100	385 µg/L	68.4	34	111
EP071: C29 - C36 Fraction	----	50	µg/L	<50	398 µg/L	58.6	34	105
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1192863)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	320 µg/L	112	74	113
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1188026)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	380 µg/L	64.1	37	99
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	597 µg/L	63.4	35	108
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	168 µg/L	64.7	11	117
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1192863)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	370 µg/L	113	74	115
EP080: BTEXN (QCLot: 1192863)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	104	84	114
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	113	81	115
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	109	84	113
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	113	84	114
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	110	87	111
EP080: Naphthalene	91-20-3	5	µg/L	<5	20 µg/L	98.2	77	118
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1188960)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.5 µg/L	88.6	70	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.5 µg/L	97.4	70	130
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.5 µg/L	83.6	70	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.5 µg/L	90.2	70	130
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.5 µg/L	87.0	70	130
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.5 µg/L	94.6	70	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1188960)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	2.5 µg/L	96.2	70	130
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.5 µg/L	92.2	70	130
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.5 µg/L	86.4	70	130
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.5 µg/L	92.4	70	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.5 µg/L	103	70	130
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.5 µg/L	91.6	70	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.5 µg/L	87.2	70	130



Sub-Matrix: **WATER**

Method: Compound				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
						LCS	Low	High
CAS Number	LOR	Unit	Result					
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1188960) - continued								
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.5 µg/L	91.0	70	130
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.5 µg/L	101	70	130
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.5 µg/L	100	70	130
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	1.25 µg/L	103	70	150
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1188960)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.5 µg/L	99.2	70	130
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	1.25 µg/L	100	70	150
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	1.25 µg/L	83.6	70	150
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	1.25 µg/L	107	70	150
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	1.25 µg/L	124	70	150
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.5 µg/L	89.4	70	130
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.5 µg/L	85.2	70	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1188960)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.5 µg/L	99.8	70	130
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.5 µg/L	90.8	70	130
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.5 µg/L	96.8	70	130
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.5 µg/L	81.4	70	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: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1188026)							
EP1711644-002	MW1701_191017	EP071: C10 - C14 Fraction	----	385 µg/L	64.8	45	122
		EP071: C15 - C28 Fraction	----	385 µg/L	73.9	55	143
		EP071: C29 - C36 Fraction	----	398 µg/L	68.7	54	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1192863)							
EP1711644-005	MW0179_181017	EP080: C6 - C9 Fraction	----	240 µg/L	118	77	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1188026)							
EP1711644-002	MW1701_191017	EP071: >C10 - C16 Fraction	----	380 µg/L	64.3	45	122
		EP071: >C16 - C34 Fraction	----	597 µg/L	73.0	55	143



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1188026) - continued							
EP1711644-002	MW1701_191017	EP071: >C34 - C40 Fraction	----	168 µg/L	74.9	54	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1192863)							
EP1711644-005	MW0179_181017	EP080: C6 - C10 Fraction	C6_C10	290 µg/L	124	77	137
EP080: BTEXN (QCLot: 1192863)							
EP1711644-005	MW0179_181017	EP080: Benzene	71-43-2	20 µg/L	105	77	122
		EP080: Toluene	108-88-3	20 µg/L	113	74	126
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1188960)							
EP1711644-001	ONW6_191017	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.5 µg/L	84.4	50	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.5 µg/L	107	50	130
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.5 µg/L	63.8	50	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.5 µg/L	75.2	50	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.5 µg/L	88.4	50	130
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.5 µg/L	94.6	50	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1188960)							
EP1711644-001	ONW6_191017	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	2.5 µg/L	104	50	130
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.5 µg/L	101	50	130
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.5 µg/L	77.8	50	130
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.5 µg/L	114	50	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.5 µg/L	122	50	130
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.5 µg/L	88.0	50	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.5 µg/L	98.0	50	130
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.5 µg/L	101	50	130
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.5 µg/L	128	50	130
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.5 µg/L	103	50	130
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	1.25 µg/L	101	50	150
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1188960)							
EP1711644-001	ONW6_191017	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.5 µg/L	88.4	50	130
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	1.25 µg/L	112	50	150
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	1.25 µg/L	92.6	50	150
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	1.25 µg/L	132	50	150
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	1.25 µg/L	118	50	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.5 µg/L	106	50	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.5 µg/L	81.6	50	130



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1188960)							
EP1711644-001	ONW6_191017	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.5 µg/L	116	50	130
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.5 µg/L	125	50	130
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.5 µg/L	101	50	130
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.5 µg/L	82.2	50	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EP1711644	Page	: 1 of 7
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Perth
Contact	: [REDACTED]	Telephone	: +61-8-9209 7655
Project	: 60543717 Perth Airport Limited DSI	Date Samples Received	: 19-Oct-2017
Site	: ----	Issue Date	: 27-Oct-2017
Sampler	: [REDACTED]	No. of samples received	: 18
Order number	: 60543717.1.3	No. of samples analysed	: 18

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: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved (EP071) MW0120N_171017, MW0135_171017, WQA03_171017, WQA06_171017	MW1708_171017, WQA01_171017, WQA04_171017,	17-Oct-2017	24-Oct-2017	24-Oct-2017	✔	25-Oct-2017	03-Dec-2017	✔
Amber Glass Bottle - Unpreserved (EP071) WQA05_181017		18-Oct-2017	24-Oct-2017	25-Oct-2017	✔	25-Oct-2017	03-Dec-2017	✔
Amber Glass Bottle - Unpreserved (EP071) MW1703_181017, MW0179_181017, WQA07_181017	MW0216_181017, MW0179D_181017,	18-Oct-2017	25-Oct-2017	25-Oct-2017	✔	25-Oct-2017	04-Dec-2017	✔
Amber Glass Bottle - Unpreserved (EP071) ONW6_191017, WQA09_191017,	MW1701_191017, WQA10_191017	19-Oct-2017	25-Oct-2017	26-Oct-2017	✔	25-Oct-2017	04-Dec-2017	✔
Amber VOC Vial - Sulfuric Acid (EP080) MW0120N_171017, MW0135_171017, WQA03_171017, WQA06_171017	MW1708_171017, WQA01_171017, WQA04_171017,	17-Oct-2017	26-Oct-2017	31-Oct-2017	✔	26-Oct-2017	31-Oct-2017	✔
Amber VOC Vial - Sulfuric Acid (EP080) MW1703_181017, MW0179_181017, WQA05_181017,	MW0216_181017, MW0179D_181017, WQA07_181017	18-Oct-2017	26-Oct-2017	01-Nov-2017	✔	26-Oct-2017	01-Nov-2017	✔
Amber VOC Vial - Sulfuric Acid (EP080) ONW6_191017, WQA09_191017, WQA11_191017	MW1701_191017, WQA10_191017,	19-Oct-2017	26-Oct-2017	02-Nov-2017	✔	26-Oct-2017	02-Nov-2017	✔



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Amber Glass Bottle - Unpreserved (EP071) MW0120N_171017, MW0135_171017, WQA03_171017, WQA06_171017	MW1708_171017, WQA01_171017, WQA04_171017,	17-Oct-2017	24-Oct-2017	24-Oct-2017	✓	25-Oct-2017	03-Dec-2017	✓
Amber Glass Bottle - Unpreserved (EP071) WQA05_181017		18-Oct-2017	24-Oct-2017	25-Oct-2017	✓	25-Oct-2017	03-Dec-2017	✓
Amber Glass Bottle - Unpreserved (EP071) MW1703_181017, MW0179_181017, WQA07_181017	MW0216_181017, MW0179D_181017,	18-Oct-2017	25-Oct-2017	25-Oct-2017	✓	25-Oct-2017	04-Dec-2017	✓
Amber Glass Bottle - Unpreserved (EP071) ONW6_191017, WQA09_191017,	MW1701_191017, WQA10_191017	19-Oct-2017	25-Oct-2017	26-Oct-2017	✓	25-Oct-2017	04-Dec-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080) MW0120N_171017, MW0135_171017, WQA03_171017, WQA06_171017	MW1708_171017, WQA01_171017, WQA04_171017,	17-Oct-2017	26-Oct-2017	31-Oct-2017	✓	26-Oct-2017	31-Oct-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080) MW1703_181017, MW0179_181017, WQA05_181017,	MW0216_181017, MW0179D_181017, WQA07_181017	18-Oct-2017	26-Oct-2017	01-Nov-2017	✓	26-Oct-2017	01-Nov-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080) ONW6_191017, WQA09_191017, WQA11_191017	MW1701_191017, WQA10_191017,	19-Oct-2017	26-Oct-2017	02-Nov-2017	✓	26-Oct-2017	02-Nov-2017	✓
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080) MW0120N_171017, MW0135_171017, WQA03_171017, WQA06_171017	MW1708_171017, WQA01_171017, WQA04_171017,	17-Oct-2017	26-Oct-2017	31-Oct-2017	✓	26-Oct-2017	31-Oct-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080) MW1703_181017, MW0179_181017, WQA05_181017,	MW0216_181017, MW0179D_181017, WQA07_181017	18-Oct-2017	26-Oct-2017	01-Nov-2017	✓	26-Oct-2017	01-Nov-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080) ONW6_191017, WQA09_191017, WQA11_191017	MW1701_191017, WQA10_191017,	19-Oct-2017	26-Oct-2017	02-Nov-2017	✓	26-Oct-2017	02-Nov-2017	✓



Matrix: **WATER**

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X) MW0120N_171017, MW0135_171017,	MW1708_171017, WQA01_171017	17-Oct-2017	----	----	----	24-Oct-2017	15-Apr-2018	✓
HDPE (no PTFE) (EP231X) MW1703_181017, MW0179_181017, WQA07_181017	MW0216_181017, MW0179D_181017,	18-Oct-2017	----	----	----	24-Oct-2017	16-Apr-2018	✓
HDPE (no PTFE) (EP231X) ONW6_191017,	MW1701_191017	19-Oct-2017	----	----	----	24-Oct-2017	17-Apr-2018	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X) MW0120N_171017, MW0135_171017,	MW1708_171017, WQA01_171017	17-Oct-2017	----	----	----	24-Oct-2017	15-Apr-2018	✓
HDPE (no PTFE) (EP231X) MW1703_181017, MW0179_181017, WQA07_181017	MW0216_181017, MW0179D_181017,	18-Oct-2017	----	----	----	24-Oct-2017	16-Apr-2018	✓
HDPE (no PTFE) (EP231X) ONW6_191017,	MW1701_191017	19-Oct-2017	----	----	----	24-Oct-2017	17-Apr-2018	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X) MW0120N_171017, MW0135_171017,	MW1708_171017, WQA01_171017	17-Oct-2017	----	----	----	24-Oct-2017	15-Apr-2018	✓
HDPE (no PTFE) (EP231X) MW1703_181017, MW0179_181017, WQA07_181017	MW0216_181017, MW0179D_181017,	18-Oct-2017	----	----	----	24-Oct-2017	16-Apr-2018	✓
HDPE (no PTFE) (EP231X) ONW6_191017,	MW1701_191017	19-Oct-2017	----	----	----	24-Oct-2017	17-Apr-2018	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X) MW0120N_171017, MW0135_171017,	MW1708_171017, WQA01_171017	17-Oct-2017	----	----	----	24-Oct-2017	15-Apr-2018	✓
HDPE (no PTFE) (EP231X) MW1703_181017, MW0179_181017, WQA07_181017	MW0216_181017, MW0179D_181017,	18-Oct-2017	----	----	----	24-Oct-2017	16-Apr-2018	✓
HDPE (no PTFE) (EP231X) ONW6_191017,	MW1701_191017	19-Oct-2017	----	----	----	24-Oct-2017	17-Apr-2018	✓

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
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) MW0120N_171017, MW0135_171017, MW1708_171017, WQA01_171017	17-Oct-2017	----	----	----	24-Oct-2017	15-Apr-2018	✓
HDPE (no PTFE) (EP231X) MW1703_181017, MW0179_181017, WQA07_181017, MW0216_181017, MW0179D_181017,	18-Oct-2017	----	----	----	24-Oct-2017	16-Apr-2018	✓
HDPE (no PTFE) (EP231X) ONW6_191017, MW1701_191017	19-Oct-2017	----	----	----	24-Oct-2017	17-Apr-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: **WATER**

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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	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
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In house: Direct injection analysis of fresh waters after dilution (1:1) with methanol. Analysis by LC-Electrospray-MS-MS, 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. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.
Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP1711644**

Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Perth
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: LEVEL 6 3 FORREST PLACE PERTH WA, AUSTRALIA 6849	Address	: 10 Hod Way Malaga WA Australia 6090
E-mail	: [REDACTED]	E-mail	: [REDACTED]
Telephone	: +61 02 8934 0000	Telephone	: +61-8-9209 7655
Facsimile	: +61 02 8934 0001	Facsimile	: +61-8-9209 7600
Project	: 60543717 Perth Airport Limited DSI	Page	: 1 of 3
Order number	: 60543717.1.3	Quote number	: EB2015AECOMAU0580 (EN/004/16)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: [REDACTED]		

Dates

Date Samples Received	: 19-Oct-2017 12:40	Issue Date	: 19-Oct-2017
Client Requested Due Date	: 27-Oct-2017	Scheduled Reporting Date	: 27-Oct-2017

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 13.4 - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 18 / 18

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (SamplesPerth@alsenviro.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**



Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

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

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

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - W-04 TRH/BTEXN	WATER - W-18 TRH(C6 - C9)/BTEXN
EP1711644-001	19-Oct-2017 00:00	ONW6_191017	✓	✓	
EP1711644-002	19-Oct-2017 00:00	MW1701_191017	✓	✓	
EP1711644-003	18-Oct-2017 00:00	MW1703_181017	✓	✓	
EP1711644-004	18-Oct-2017 00:00	MW0216_181017	✓	✓	
EP1711644-005	18-Oct-2017 00:00	MW0179_181017	✓	✓	
EP1711644-006	18-Oct-2017 00:00	MW0179D_181017	✓	✓	
EP1711644-007	17-Oct-2017 00:00	MW0120N_171017	✓	✓	
EP1711644-008	17-Oct-2017 00:00	MW1708_171017	✓	✓	
EP1711644-009	17-Oct-2017 00:00	MW0135_171017	✓	✓	
EP1711644-010	17-Oct-2017 00:00	WQA01_171017	✓	✓	
EP1711644-011	17-Oct-2017 00:00	WQA03_171017		✓	
EP1711644-012	17-Oct-2017 00:00	WQA04_171017		✓	
EP1711644-013	18-Oct-2017 00:00	WQA05_181017		✓	
EP1711644-014	17-Oct-2017 00:00	WQA06_171017		✓	
EP1711644-015	18-Oct-2017 00:00	WQA07_181017	✓	✓	
EP1711644-016	19-Oct-2017 00:00	WQA09_191017		✓	
EP1711644-017	19-Oct-2017 00:00	WQA10_191017		✓	
EP1711644-018	19-Oct-2017 00:00	WQA11_191017			✓

Proactive Holding Time Report

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



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email AP_CustomerService.ANZ@aecom.com

- Chain of Custody (CoC) (COC)

Email AP_CustomerService.ANZ@aecom.com

- *AU Certificate of Analysis - NATA (COA)

Email

- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)

Email

- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)

Email

- A4 - AU Sample Receipt Notification - Environmental HT (SRN)

Email

- A4 - AU Tax Invoice (INV)

Email

- Chain of Custody (CoC) (COC)

Email

- EDI Format - ENMRG (ENMRG)

Email

- EDI Format - EQUIS V5 URS (EQUIS_V5_AECOM)

Email

- EDI Format - ESDAT (ESDAT)

Email

- EDI Format - XTab (XTAB)

Email

- Electronic SRN for EQUIS (ESRN_EQUIS)

Email

- *AU Certificate of Analysis - NATA (COA)

Email

- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)

Email

- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)

Email

- A4 - AU Sample Receipt Notification - Environmental HT (SRN)

Email

- A4 - AU Tax Invoice (INV)

Email

- Chain of Custody (CoC) (COC)

Email

- EDI Format - ENMRG (ENMRG)

Email

- EDI Format - EQUIS V5 URS (EQUIS_V5_AECOM)

Email

- EDI Format - ESDAT (ESDAT)

Email

- EDI Format - XTab (XTAB)

Email

- Electronic SRN for EQUIS (ESRN_EQUIS)

Email

CERTIFICATE OF ANALYSIS

Work Order : **EP1710035**
Client : **AECOM Australia Pty Ltd**
Contact : < first name > < last name >
Address : LEVEL 6 3 FORREST PLACE
 PERTH WA, AUSTRALIA 6849
Telephone : +61 08 6208 0000
Project : 60543717.1.3 Airservices Perth Airport LSI
Order number : 60543717.1.3
C-O-C number : ----
Sampler : [REDACTED]
Site : ----
Quote number : EP/541/17
No. of samples received : 64
No. of samples analysed : 35

Page : 1 of 35
Laboratory : Environmental Division Perth
Contact : [REDACTED]
Address : 10 Hod Way Malaga WA Australia 6090
Telephone : +61-8-9209 7655
Date Samples Received : 12-Sep-2017 17:00
Date Analysis Commenced : 14-Sep-2017
Issue Date : 25-Sep-2017 19:21



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
[REDACTED]	Organic Chemist	Sydney Organics, Smithfield, NSW
[REDACTED]	Metals Instrument Chemist	Perth Inorganics, Malaga, WA
[REDACTED]	Client Services - Technical Manager	Perth Organics, Malaga, WA
[REDACTED]	Organic Chemist	Perth Organics, Malaga, WA



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

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.

- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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.
- 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.



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB1715_0.0_0.1	SB1715_0.1_0.5	SB1716_0.0_0.1	SB1716_0.1_0.5	SB1717_0.0_0.1
Client sampling date / time				12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710035-001	EP1710035-002	EP1710035-005	EP1710035-006	EP1710035-013
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	3.5	3.7	15.7	6.5	3.3
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB1715_0.0_0.1	SB1715_0.1_0.5	SB1716_0.0_0.1	SB1716_0.1_0.5	SB1717_0.0_0.1
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit		EP1710035-001	EP1710035-002	EP1710035-005	EP1710035-006	EP1710035-013
				Result	Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		0.0011	0.0008	0.0005	<0.0002	0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		0.0261	0.0864	0.0072	0.0084	0.0042
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		0.0014	<0.0002	<0.0002	<0.0002	0.0018
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB1715_0.0_0.1	SB1715_0.1_0.5	SB1716_0.0_0.1	SB1716_0.1_0.5	SB1717_0.0_0.1
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit		EP1710035-001	EP1710035-002	EP1710035-005	EP1710035-006	EP1710035-013
				Result	Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<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	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg	0.0286	0.0872	0.0077	0.0084	0.0067	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB1715_0.0_0.1	SB1715_0.1_0.5	SB1716_0.0_0.1	SB1716_0.1_0.5	SB1717_0.0_0.1
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit		EP1710035-001	EP1710035-002	EP1710035-005	EP1710035-006	EP1710035-013
				Result	Result	Result	Result	Result	Result
EP231P: PFAS Sums - Continued									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		0.0272	0.0872	0.0077	0.0084	0.0047
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		0.0272	0.0872	0.0077	0.0084	0.0047
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		109	98.3	99.9	104	98.3
2-Chlorophenol-D4	93951-73-6	0.5	%		88.8	101	102	106	99.2
2,4,6-Tribromophenol	118-79-6	0.5	%		101	84.8	89.8	92.1	97.6
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		102	100	99.5	104	99.5
Anthracene-d10	1719-06-8	0.5	%		120	123	124	122	114
4-Terphenyl-d14	1718-51-0	0.5	%		128	124	128	126	118
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		117	116	113	115	127
Toluene-D8	2037-26-5	0.2	%		86.0	86.6	85.1	88.0	94.2
4-Bromofluorobenzene	460-00-4	0.2	%		82.5	81.7	81.4	83.9	90.8
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		98.0	79.0	66.0	85.0	87.0



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB1717_0.1_0.5	SB1718_0.0_0.1	SB1718_0.1_0.5	SB1719_0.0_0.1	SB1719_0.1_0.5
Client sampling date / time				12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710035-014	EP1710035-018	EP1710035-019	EP1710035-022	EP1710035-023
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	6.2	4.0	13.1	3.4	4.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB1717_0.1_0.5	SB1718_0.0_0.1	SB1718_0.1_0.5	SB1719_0.0_0.1	SB1719_0.1_0.5
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit		EP1710035-014	EP1710035-018	EP1710035-019	EP1710035-022	EP1710035-023
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		0.0011	0.0005	0.0007	0.0007	0.0032
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		0.179	0.0010	0.0020	0.0214	0.0028
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	0.0002	0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		0.0003	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB1717_0.1_0.5	SB1718_0.0_0.1	SB1718_0.1_0.5	SB1719_0.0_0.1	SB1719_0.1_0.5
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit		EP1710035-014	EP1710035-018	EP1710035-019	EP1710035-022	EP1710035-023
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		0.0010	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<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	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		0.182	0.0015	0.0027	0.0223	0.0062



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB1717_0.1_0.5	SB1718_0.0_0.1	SB1718_0.1_0.5	SB1719_0.0_0.1	SB1719_0.1_0.5
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit		EP1710035-014	EP1710035-018	EP1710035-019	EP1710035-022	EP1710035-023
					Result	Result	Result	Result	Result
EP231P: PFAS Sums - Continued									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		0.180	0.0015	0.0027	0.0221	0.0060
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		0.181	0.0015	0.0027	0.0221	0.0060
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		99.9	103	101	99.2	105
2-Chlorophenol-D4	93951-73-6	0.5	%		100	103	103	101	107
2,4,6-Tribromophenol	118-79-6	0.5	%		98.1	92.1	97.9	86.7	103
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		103	100	100	102	103
Anthracene-d10	1719-06-8	0.5	%		123	121	122	120	124
4-Terphenyl-d14	1718-51-0	0.5	%		128	121	123	124	129
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		114	118	112	116	118
Toluene-D8	2037-26-5	0.2	%		83.7	86.7	79.6	85.8	87.2
4-Bromofluorobenzene	460-00-4	0.2	%		82.6	84.0	78.7	81.9	86.7
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		87.0	79.0	92.0	88.0	91.0



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB1720_0.0_0.1	SB1720_0.1_0.5	SB1721_0.0_0.1	SB1721_0.1_0.5	SQA01_120917
Client sampling date / time				12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710035-026	EP1710035-027	EP1710035-030	EP1710035-031	EP1710035-034
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	4.8	4.8	6.1	5.1	7.7
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.6	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	2.4	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	2.1	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.9	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	1.4	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	1.6	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.8	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	1.0	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.9	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	1.1	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	12.8	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	1.4	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	1.7	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.9	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB1720_0.0_0.1	SB1720_0.1_0.5	SB1721_0.0_0.1	SB1721_0.1_0.5	SQA01_120917
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit		EP1710035-026	EP1710035-027	EP1710035-030	EP1710035-031	EP1710035-034
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		0.0003	0.0007	<0.0002	0.0002	0.0066
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB1720_0.0_0.1	SB1720_0.1_0.5	SB1721_0.0_0.1	SB1721_0.1_0.5	SQA01_120917
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit		EP1710035-026	EP1710035-027	EP1710035-030	EP1710035-031	EP1710035-034
				Result	Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<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	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		0.0003	0.0007	<0.0002	0.0002	0.0066



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB1720_0.0_0.1	SB1720_0.1_0.5	SB1721_0.0_0.1	SB1721_0.1_0.5	SQA01_120917
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit		EP1710035-026	EP1710035-027	EP1710035-030	EP1710035-031	EP1710035-034
					Result	Result	Result	Result	Result
EP231P: PFAS Sums - Continued									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		0.0003	0.0007	<0.0002	0.0002	0.0066
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		0.0003	0.0007	<0.0002	0.0002	0.0066
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		104	102	104	96.7	106
2-Chlorophenol-D4	93951-73-6	0.5	%		106	104	105	99.2	106
2,4,6-Tribromophenol	118-79-6	0.5	%		102	91.6	88.5	96.0	105
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		107	106	103	100	107
Anthracene-d10	1719-06-8	0.5	%		119	123	120	122	124
4-Terphenyl-d14	1718-51-0	0.5	%		127	129	129	115	126
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		117	118	122	116	114
Toluene-D8	2037-26-5	0.2	%		83.0	85.5	86.5	85.1	84.0
4-Bromofluorobenzene	460-00-4	0.2	%		83.3	85.4	84.1	82.4	81.9
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		90.0	87.0	64.0	67.0	73.0



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SQA06_120917	LR TBS395	LR TBS398	LR TBS399	SB1722_0.0_0.1
Client sampling date / time				12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710035-037	EP1710035-040	EP1710035-041	EP1710035-042	EP1710035-043
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	3.2	<1.0	<1.0	<1.0	2.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	----	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	----	----	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	----	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	----	----	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	----	----	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	----	----	----	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	----	----	----	1.2
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	<10
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	<50
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	<100
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	----	----	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	----	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	----	----	----	<100



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SQA06_120917	LR TBS395	LR TBS398	LR TBS399	SB1722_0.0_0.1
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit		EP1710035-037	EP1710035-040	EP1710035-041	EP1710035-042	EP1710035-043
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	----	----	----	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	----	----	----	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
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		0.0006	----	----	----	<0.0002
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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SQA06_120917	LR TBS395	LR TBS398	LR TBS399	SB1722_0.0_0.1
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit		EP1710035-037	EP1710035-040	EP1710035-041	EP1710035-042	EP1710035-043
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
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
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)	2448-09-7	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		0.0006	----	----	----	<0.0002



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SQA06_120917	LR TBS395	LR TBS398	LR TBS399	SB1722_0.0_0.1
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit		EP1710035-037	EP1710035-040	EP1710035-041	EP1710035-042	EP1710035-043
					Result	Result	Result	Result	Result
EP231P: PFAS Sums - Continued									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		0.0006	----	----	----	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		0.0006	----	----	----	<0.0002
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		103	----	----	----	98.6
2-Chlorophenol-D4	93951-73-6	0.5	%		105	----	----	----	105
2,4,6-Tribromophenol	118-79-6	0.5	%		104	----	----	----	102
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		107	----	----	----	111
Anthracene-d10	1719-06-8	0.5	%		118	----	----	----	123
4-Terphenyl-d14	1718-51-0	0.5	%		123	----	----	----	126
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		115	90.8	93.5	90.6	118
Toluene-D8	2037-26-5	0.2	%		83.5	81.7	82.0	85.2	84.1
4-Bromofluorobenzene	460-00-4	0.2	%		81.9	77.9	76.8	78.0	83.8
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		110	----	----	----	86.0



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB1722_0.1_0.5	SB1723_0.0_0.1	SB1723_0.1_0.5	SB1724_0.0_0.1	SB1724_0.1_0.5
Client sampling date / time				12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710035-044	EP1710035-047	EP1710035-048	EP1710035-051	EP1710035-052
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	3.4	2.6	2.9	2.1	2.9
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.6	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	1.1	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB1722_0.1_0.5	SB1723_0.0_0.1	SB1723_0.1_0.5	SB1724_0.0_0.1	SB1724_0.1_0.5
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit		EP1710035-044	EP1710035-047	EP1710035-048	EP1710035-051	EP1710035-052
				Result	Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	0.0010	0.0006	0.0008	0.0003
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB1722_0.1_0.5	SB1723_0.0_0.1	SB1723_0.1_0.5	SB1724_0.0_0.1	SB1724_0.1_0.5
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit		EP1710035-044	EP1710035-047	EP1710035-048	EP1710035-051	EP1710035-052
				Result	Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<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	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg	<0.0002	0.0010	0.0006	0.0008	0.0003	0.0003



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB1722_0.1_0.5	SB1723_0.0_0.1	SB1723_0.1_0.5	SB1724_0.0_0.1	SB1724_0.1_0.5
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit		EP1710035-044	EP1710035-047	EP1710035-048	EP1710035-051	EP1710035-052
				Result	Result	Result	Result	Result	Result
EP231P: PFAS Sums - Continued									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	0.0010	0.0006	0.0008	0.0003
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	0.0010	0.0006	0.0008	0.0003
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		99.1	99.6	96.0	103	110
2-Chlorophenol-D4	93951-73-6	0.5	%		106	106	102	100	103
2,4,6-Tribromophenol	118-79-6	0.5	%		101	90.2	86.1	85.4	90.8
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		112	117	115	111	107
Anthracene-d10	1719-06-8	0.5	%		124	123	123	106	101
4-Terphenyl-d14	1718-51-0	0.5	%		129	122	120	109	111
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		119	121	119	92.7	89.9
Toluene-D8	2037-26-5	0.2	%		88.8	86.5	85.0	83.7	81.2
4-Bromofluorobenzene	460-00-4	0.2	%		82.8	83.7	83.2	76.9	77.1
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		76.0	90.0	88.0	76.0	81.0



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	SB1725_0.0_0.1	SB1725_0.1_0.5	----	----	----
Client sampling date / time				12-Sep-2017 00:00	12-Sep-2017 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EP1710035-056	EP1710035-057	-----	-----	-----
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	4.9	7.2	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	0.6	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg	0.7	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	0.8	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	2.6	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	0.6	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.9	0.6	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	120	<100	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB1725_0.0_0.1	SB1725_0.1_0.5	----	----	----
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EP1710035-056	EP1710035-057	-----	-----	-----
				Result	Result		----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		120	<50	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	----	----	----
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		0.0008	0.0003	----	----	----
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	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB1725_0.0_0.1	SB1725_0.1_0.5	----	----	----
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EP1710035-056	EP1710035-057	-----	-----	-----
				Result	Result		----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
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	----	----	----
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)	2448-09-7	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		0.0008	0.0003	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB1725_0.0_0.1	SB1725_0.1_0.5	----	----	----
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EP1710035-056	EP1710035-057	-----	-----	-----
				Result	Result		----	----	----
EP231P: PFAS Sums - Continued									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		0.0008	0.0003	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		0.0008	0.0003	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		103	113	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		91.3	97.2	----	----	----
2,4,6-Tribromophenol	118-79-6	0.5	%		74.2	94.7	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		100	114	----	----	----
Anthracene-d10	1719-06-8	0.5	%		86.0	112	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		104	116	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		92.4	89.4	----	----	----
Toluene-D8	2037-26-5	0.2	%		80.7	76.2	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		76.0	70.9	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		83.0	73.0	----	----	----

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SQA07_120917	SQA08_120917	SW1721_120917	SW1723_120917	SW1724_120917
Client sampling date / time				12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	
Compound	CAS Number	LOR	Unit	EP1710035-038	EP1710035-039	EP1710035-060	EP1710035-061	EP1710035-062	
				Result	Result	Result	Result	Result	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20	
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20	
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100	
EP080: BTEXN									



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				SQA07_120917	SQA08_120917	SW1721_120917	SW1723_120917	SW1724_120917
Client sampling date / time				12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710035-038	EP1710035-039	EP1710035-060	EP1710035-061	EP1710035-062
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	0.08
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	0.12
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.08	0.07	1.51
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	0.07
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.14	0.07	2.53
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	0.05
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	0.02	0.26
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	0.04
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.01	<0.01	0.09
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SQA07_120917	SQA08_120917	SW1721_120917	SW1723_120917	SW1724_120917
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit		EP1710035-038	EP1710035-039	EP1710035-060	EP1710035-061	EP1710035-062
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	0.23	0.16	4.75
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	0.22	0.14	4.04
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	0.23	0.16	4.56
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		19.5	14.2	13.5	11.6	11.5
2-Chlorophenol-D4	93951-73-6	1.0	%		58.5	42.2	40.7	33.1	32.6



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Client sample ID

				SQA07_120917	SQA08_120917	SW1721_120917	SW1723_120917	SW1724_120917
Client sampling date / time				12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710035-038	EP1710035-039	EP1710035-060	EP1710035-061	EP1710035-062
				Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued								
2,4,6-Tribromophenol	118-79-6	1.0	%	76.6	53.1	66.5	41.6	39.1
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1.0	%	75.6	50.6	51.8	44.8	41.3
Anthracene-d10	1719-06-8	1.0	%	82.6	63.4	65.8	50.6	46.7
4-Terphenyl-d14	1718-51-0	1.0	%	83.3	67.4	71.0	51.9	45.4
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	2	%	95.8	94.3	95.2	97.7	101
Toluene-D8	2037-26-5	2	%	103	102	101	101	99.9
4-Bromofluorobenzene	460-00-4	2	%	91.7	89.8	91.0	91.0	92.7
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	122	125	102	116	104

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW1722_120917	LR TBW824	WQA01_120917	----	----
Client sampling date / time				12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	----	----	
Compound	CAS Number	LOR	Unit	EP1710035-063	EP1710035-064	EP1710035-065	-----	-----	
				Result	Result	Result	----	----	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	<1.0	----	----	
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	<1.0	----	----	
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	<1.0	----	----	
Fluorene	86-73-7	1.0	µg/L	<1.0	----	<1.0	----	----	
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	<1.0	----	----	
Anthracene	120-12-7	1.0	µg/L	<1.0	----	<1.0	----	----	
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	<1.0	----	----	
Pyrene	129-00-0	1.0	µg/L	<1.0	----	<1.0	----	----	
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	<1.0	----	----	
Chrysene	218-01-9	1.0	µg/L	<1.0	----	<1.0	----	----	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	----	<1.0	----	----	
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	<1.0	----	----	
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	<0.5	----	----	
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	<1.0	----	----	
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	----	<1.0	----	----	
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	----	<1.0	----	----	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	----	<0.5	----	----	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	----	<0.5	----	----	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	----	----	
C10 - C14 Fraction	----	50	µg/L	<50	----	<50	----	----	
C15 - C28 Fraction	----	100	µg/L	180	----	140	----	----	
C29 - C36 Fraction	----	50	µg/L	120	----	90	----	----	
^ C10 - C36 Fraction (sum)	----	50	µg/L	300	----	230	----	----	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	----	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	----	----	
>C10 - C16 Fraction	----	100	µg/L	<100	----	<100	----	----	
>C16 - C34 Fraction	----	100	µg/L	270	----	200	----	----	
>C34 - C40 Fraction	----	100	µg/L	<100	----	<100	----	----	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	270	----	200	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	<100	----	----	
EP080: BTEXN									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW1722_120917	LR TBW824	WQA01_120917	----	----
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	----	----
Compound	CAS Number	LOR	Unit		EP1710035-063	EP1710035-064	EP1710035-065	-----	-----
					Result	Result	Result	----	----
EP080: BTEXN - Continued									
Benzene	71-43-2	1	µg/L		<1	<1	<1	----	----
Toluene	108-88-3	2	µg/L		<2	<2	<2	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	----	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.08	----	0.08	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.12	----	0.12	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		1.62	----	1.57	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.08	----	0.07	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		4.62	----	4.47	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		0.06	----	0.06	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		0.31	----	0.30	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		0.06	----	0.06	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		0.13	----	0.14	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	<0.02	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW1722_120917	LR TBW824	WQA01_120917	----	----
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	----	----
Compound	CAS Number	LOR	Unit		EP1710035-063	EP1710035-064	EP1710035-065	-----	-----
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L		<0.05	----	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	<0.05	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		7.08	----	6.87	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		6.24	----	6.04	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		6.88	----	6.68	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		15.9	----	14.8	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%		47.2	----	43.0	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW1722_120917	LR TBW824	WQA01_120917	----	----
Client sampling date / time					12-Sep-2017 00:00	12-Sep-2017 00:00	12-Sep-2017 00:00	----	----
Compound	CAS Number	LOR	Unit		EP1710035-063	EP1710035-064	EP1710035-065	-----	-----
				Result	Result	Result		----	----
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2,4,6-Tribromophenol	118-79-6	1.0	%		69.4	----	70.2	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		59.6	----	56.3	----	----
Anthracene-d10	1719-06-8	1.0	%		66.8	----	66.9	----	----
4-Terphenyl-d14	1718-51-0	1.0	%		68.4	----	68.7	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%		94.6	99.7	96.8	----	----
Toluene-D8	2037-26-5	2	%		103	98.5	101	----	----
4-Bromofluorobenzene	460-00-4	2	%		90.1	89.7	90.5	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		102	----	96.4	----	----



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	57	119
2-Chlorophenol-D4	93951-73-6	52	130
2,4,6-Tribromophenol	118-79-6	40	132
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	53	139
Anthracene-d10	1719-06-8	68	124
4-Terphenyl-d14	1718-51-0	66	132
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	63	132
Toluene-D8	2037-26-5	66	125
4-Bromofluorobenzene	460-00-4	60	124
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	130

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	67
2-Chlorophenol-D4	93951-73-6	29	120
2,4,6-Tribromophenol	118-79-6	10	131
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	34	131
Anthracene-d10	1719-06-8	43	127
4-Terphenyl-d14	1718-51-0	41	142
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	61	141
Toluene-D8	2037-26-5	73	126
4-Bromofluorobenzene	460-00-4	60	125
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	130

QUALITY CONTROL REPORT

Work Order	: EP1710035	Page	: 1 of 28
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Perth
Contact	: < first name > < last name >	Contact	: [REDACTED]
Address	: LEVEL 6 3 FORREST PLACE PERTH WA, AUSTRALIA 6849	Address	: 10 Hod Way Malaga WA Australia 6090
Telephone	: +61 08 6208 0000	Telephone	: +61-8-9209 7655
Project	: 60543717.1.3 Airservices Perth Airport LSI	Date Samples Received	: 12-Sep-2017
Order number	: 60543717.1.3	Date Analysis Commenced	: 14-Sep-2017
C-O-C number	: ----	Issue Date	: 25-Sep-2017
Sampler	: [REDACTED]		
Site	: ----		
Quote number	: EP/541/17		
No. of samples received	: 64		
No. of samples analysed	: 35		



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
[REDACTED]	Organic Chemist	Sydney Organics, Smithfield, NSW
[REDACTED]	Metals Instrument Chemist	Perth Inorganics, Malaga, WA
[REDACTED]	Client Services - Technical Manager	Perth Organics, Malaga, WA
[REDACTED]	Organic Chemist	Perth Organics, Malaga, WA



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 (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1118805)									
EP1710035-001	SB1715_0.0_0.1	EA055: Moisture Content	----	1	%	3.5	3.3	5.09	No Limit
EP1710035-023	SB1719_0.1_0.5	EA055: Moisture Content	----	1	%	4.0	4.1	0.00	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1118806)									
EP1710035-044	SB1722_0.1_0.5	EA055: Moisture Content	----	1	%	3.4	2.8	20.9	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1113165)									
EP1710035-001	SB1715_0.0_0.1	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			205-82-3						
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP1710035-026	SB1720_0.0_0.1	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1113175)



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 (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1113175) - continued									
EP1710076-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	2360	2290	3.05	0% - 20%
		EP071: C29 - C36 Fraction	----	100	mg/kg	490	470	4.76	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	490	480	2.69	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1113191)									
EP1710035-001	SB1715_0.0_0.1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP1710035-026	SB1720_0.0_0.1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1113196)									
EP1710035-040	LR TBS395	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1113166)									
EP1710035-001	SB1715_0.0_0.1	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP1710035-026	SB1720_0.0_0.1	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1113175)									
EP1710076-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	2380	2300	3.48	0% - 20%
		EP071: >C34 - C40 Fraction	----	100	mg/kg	240	230	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	810	790	2.44	0% - 50%
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1113191)									
EP1710035-001	SB1715_0.0_0.1	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP1710035-026	SB1720_0.0_0.1	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1113196)									
EP1710035-040	LR TBS395	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 1113191)									
EP1710035-001	SB1715_0.0_0.1	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP1710035-026	SB1720_0.0_0.1	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit		



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 (%)
EP080: BTEXN (QC Lot: 1113196)									
EP1710035-040	LR TBS395	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1113511)									
EP1710035-001	SB1715_0.0_0.1	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	0.0011	0.0012	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	0.0261	0.0244	6.55	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0014	0.0012	12.0	No Limit
EP1710035-027	SB1720_0.1_0.5	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	0.0007	0.0006	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1113515)									
EB1718842-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0026	0.0023	10.8	0% - 50%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0031	0.0027	13.9	0% - 50%
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0311	0.0258	18.7	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0041	0.0036	14.4	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.246	0.241	1.95	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0004	0.0004	0.00	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1118810)									
EM1712542-001	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	0.0004	0.0003	33.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1125702)									
EP1710035-014	SB1717_0.1_0.5	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	0.0011	0.0012	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1125702) - continued									
EP1710035-014	SB1717_0.1_0.5	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.179	0.197	9.66	0% - 20%
		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: 1113511)									
EP1710035-001	SB1715_0.0_0.1	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
EP1710035-027	SB1720_0.1_0.5	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1113515)									
EB1718842-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0012	0.0012	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0095	0.0082	14.7	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0010	0.0008	16.3	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0042	0.0040	3.22	0% - 20%
		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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1118810)									
EM1712542-001	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



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 (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1118810) - continued									
EM1712542-001	Anonymous	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 (PFTTrDA)	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		
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1125702)									
EP1710035-014	SB1717_0.1_0.5	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0003	0.0003	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 (PFTTrDA)	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: 1113511)									
EP1710035-001	SB1715_0.0_0.1	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)	2448-09-7	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
EP1710035-027	SB1720_0.1_0.5	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



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 (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1113511) - continued									
EP1710035-027	SB1720_0.1_0.5	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)	2448-09-7	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1113515)									
EB1718842-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	0.0005	0.0004	31.4	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)	2448-09-7	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
		EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1118810)							
EM1712542-001	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)	2448-09-7	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
		EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1125702)							
EP1710035-014	SB1717_0.1_0.5	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	0.0010	0.0012	17.9	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1125702) - continued									
EP1710035-014	SB1717_0.1_0.5	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)	2448-09-7	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: 1113511)									
EP1710035-001	SB1715_0.0_0.1	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		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
EP1710035-027	SB1720_0.1_0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1113515)									
EB1718842-001	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
		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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1118810)									
EM1712542-001	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
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1118810) - continued									
EM1712542-001	Anonymous	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1125702)									
EP1710035-014	SB1717_0.1_0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		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
Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1113242)									
EP1710070-013	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EP1710070-008	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1119542)									
EP1709467-066	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP1710081-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	80	90	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1113242)									
EP1710070-013	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP1710070-008	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1119542)									
EP1709467-066	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP1710081-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	120	130	0.00	No Limit
EP080: BTEXN (QC Lot: 1119542)									
EP1709467-066	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
EP080: BTEXN (QC Lot: 1119542) - continued										
EP1709467-066	Anonymous	EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.00	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit	
EP1710081-002	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit	
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	8	8	0.00	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	2	3	0.00	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	12	12	0.00	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	6	6	0.00	No Limit	
	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit		
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1113520)										
EM1712339-010	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit	
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
EP1710035-065	WQA01_120917	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	4.47	4.74	5.99	0% - 20%	
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.08	0.08	0.00	No Limit	
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.12	0.12	0.00	No Limit	
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	1.57	1.59	1.33	0% - 20%	
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.07	0.08	0.00	No Limit	
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1113520)										
EM1712339-010	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit	
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit	
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit	
EP1710035-065	WQA01_120917	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.14	0.13	0.00	0% - 50%	
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.06	0.08	20.7	No Limit	
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.30	0.33	9.62	0% - 50%	
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.06	0.06	0.00	No Limit	



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1113520) - continued									
EP1710035-065	WQA01_120917	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1113520)									
EM1712339-010	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP1710035-065	WQA01_120917	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1113520)									
EM1712339-010	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit

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 Work Order : EP1710035
 Client : AECOM Australia Pty Ltd
 Project : 60543717.1.3 Airservices Perth Airport LSI



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1113520) - continued									
EM1712339-010	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP1710035-065	WQA01_120917	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 1113520)									
EM1712339-010	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EP1710035-065	WQA01_120917	EP231X: Sum of PFAS	----	0.01	µg/L	6.87	7.21	4.83	0% - 20%



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

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

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1113165)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	110	71	123
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	115	69	129
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	102	65	125
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	111	71	125
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	105	66	124
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	111	60	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	117	67	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	114	65	127
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	108	57	125
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	125	57	131
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	3 mg/kg	89.8	65	125
	205-82-3							
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	108	69	127
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	99.2	63	121
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	88.0	61	121
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	73.6	52	128
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	91.4	65	125
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1113176)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	118	71	123
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	107	69	129
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	107	65	125
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	96.7	71	125
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	108	66	124
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	112	60	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	113	67	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	112	65	127
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	109	57	125
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	115	57	131
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	3 mg/kg	90.4	65	125
	205-82-3							
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	112	69	127
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	98.7	63	121
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	93.1	61	121
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	79.8	52	128
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	99.1	65	125



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1113166)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	1286 mg/kg	104	70	120
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	2920 mg/kg	104	69	117
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	400 mg/kg	100	59	113
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1113175)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	1286 mg/kg	96.2	70	120
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	2920 mg/kg	94.7	69	117
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	400 mg/kg	91.3	59	113
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1113191)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	32 mg/kg	113	66	122
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1113196)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	32 mg/kg	87.2	66	122
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1113166)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	2022 mg/kg	106	71	117
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	2349 mg/kg	98.9	65	119
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	129 mg/kg	77.0	42	124
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1113175)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	2022 mg/kg	96.0	71	117
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	2349 mg/kg	96.4	65	119
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	129 mg/kg	88.9	42	124
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1113191)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	37 mg/kg	110	66	122
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1113196)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	37 mg/kg	91.5	66	122
EP080: BTEXN (QCLot: 1113191)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	118	72	122
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	108	75	119
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	112	73	121
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	4 mg/kg	110	74	122
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	113	75	121
EP080: Naphthalene	91-20-3	1	mg/kg	<1	2 mg/kg	110	64	126
EP080: BTEXN (QCLot: 1113196)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	87.5	72	122
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	88.0	75	119
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	88.5	73	121
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	4 mg/kg	86.7	74	122
	106-42-3							



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP080: BTEXN (QCLot: 1113196) - continued								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	89.5	75	121
EP080: Naphthalene	91-20-3	1	mg/kg	<1	2 mg/kg	88.3	64	126
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1113511)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	66.5	57	121
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	55	125
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.0	52	126
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.2	54	123
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.4	55	127
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.0	54	125
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1113515)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	57	121
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	55	125
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	52	126
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.4	54	123
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.9	55	127
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.0	54	125
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1118810)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	70.6	57	121
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	55	125
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.6	52	126
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	73.8	54	123
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	71.2	55	127
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	54	125
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1125702)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.4	57	121
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.8	55	125
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.0	52	126
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.6	54	123
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	55	127
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	54	125
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1113511)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	86.5	52	128
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	75.6	54	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	58	127
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.5	57	128
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	60	134
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.4	63	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	55	130



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1113511) - continued								
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.3	62	130
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	70.0	53	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.5	49	129
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	89.2	59	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1113515)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	107	52	128
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	54	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	124	58	127
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	122	57	128
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	60	134
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	63	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.4	55	130
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.4	62	130
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.5	53	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.9	49	129
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	80.9	59	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1118810)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	78.4	52	128
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	54	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	70.2	58	127
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.9	57	128
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.3	60	134
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.2	63	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	74.6	55	130
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	71.0	62	130
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	71.8	53	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.5	49	129
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.4	59	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1125702)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	79.6	52	128
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	73.8	54	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.3	58	127
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.5	57	128
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	63.0	60	134
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	74.9	63	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	71.6	55	130
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	67.2	62	130
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	65.5	53	134

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1125702) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	61.5	49	129
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	65.0	59	129
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1113511)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.8	52	132
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	87.2	65	126
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	84.8	64	126
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	77.1	63	124
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	85.6	58	125
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	61	130
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	55	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1113515)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.8	52	132
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	65	126
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.5	64	126
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	80.5	63	124
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	58	125
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	121	61	130
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.5	55	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1118810)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.2	52	132
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	83.5	65	126
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	82.0	64	126
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	82.7	63	124
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	72.8	58	125
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	113	61	130
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	67.2	55	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1125702)								



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) LowHigh	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1125702) - continued								
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	72.2	65	126
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	71.6	64	126
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.0	63	124
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	77.2	58	125
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.7	61	130
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	75.0	55	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1113511)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	87.7	54	130
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	96.6	61	130
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	98.8	62	130
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	105	60	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1113515)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	89.8	54	130
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	116	61	130
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	66.8	62	130
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	97.3	60	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1118810)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	64.9	54	130
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	70.4	61	130
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	72.2	62	130
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	87.6	60	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1125702)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	85.4	54	130
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	74.1	61	130
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	72.9	62	130
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	67.3	60	130

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)		
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1113241)									
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	10 µg/L	52.2	42	99	
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	10 µg/L	50.0	36	113	
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	10 µg/L	53.0	36	102	



Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1113241) - continued								
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	10 µg/L	52.6	34	113
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	10 µg/L	55.5	37	115
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	10 µg/L	49.9	46	109
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	10 µg/L	54.3	40	124
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	10 µg/L	54.6	40	123
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	10 µg/L	53.7	40	126
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	10 µg/L	53.5	46	121
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	1	µg/L	<1.0	10 µg/L	58.2	43	123
	205-82-3							
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	10 µg/L	59.8	47	121
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	10 µg/L	54.3	45	123
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	10 µg/L	54.1	39	120
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	10 µg/L	53.7	39	119
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	10 µg/L	56.0	40	123
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1113242)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	385 µg/L	63.0	35	95
EP071: C15 - C28 Fraction	----	100	µg/L	<100	385 µg/L	69.1	34	111
EP071: C29 - C36 Fraction	----	50	µg/L	<50	398 µg/L	61.3	34	105
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1119542)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	320 µg/L	102	74	113
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1113242)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	380 µg/L	66.3	37	99
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	597 µg/L	64.3	35	108
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	168 µg/L	70.3	11	117
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1119542)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	370 µg/L	109	74	115
EP080: BTEXN (QCLot: 1119542)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	105	84	114
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	111	81	115
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	96.9	84	113
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	40 µg/L	94.3	84	114
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	96.3	87	111
EP080: Naphthalene	91-20-3	5	µg/L	<5	20 µg/L	98.2	77	118
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1113520)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.5 µg/L	92.6	70	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.5 µg/L	94.2	70	130



Sub-Matrix: **WATER**

Method: Compound				Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
						LCS	Low	High
CAS Number	LOR	Unit						
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1113520) - continued								
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.5 µg/L	90.0	70	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.5 µg/L	89.8	70	130
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.5 µg/L	91.4	70	130
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.5 µg/L	88.0	70	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1113520)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	2.5 µg/L	98.0	70	130
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.5 µg/L	82.6	70	130
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.5 µg/L	87.8	70	130
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.5 µg/L	87.4	70	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.5 µg/L	94.8	70	130
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.5 µg/L	88.2	70	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.5 µg/L	90.6	70	130
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.5 µg/L	83.6	70	130
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.5 µg/L	86.4	70	130
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.5 µg/L	90.2	70	130
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	1.25 µg/L	77.0	70	150
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1113520)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.5 µg/L	85.6	70	130
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	1.25 µg/L	81.6	70	150
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	1.25 µg/L	76.4	70	150
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	1.25 µg/L	98.2	70	150
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	1.25 µg/L	101	70	150
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.5 µg/L	96.0	70	130
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.5 µg/L	95.4	70	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1113520)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.5 µg/L	114	70	130
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.5 µg/L	86.8	70	130
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.5 µg/L	107	70	130
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.5 µg/L	80.0	70	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**

Matrix Spike (MS) Report

Page : 22 of 28
 Work Order : EP1710035
 Client : AECOM Australia Pty Ltd
 Project : 60543717.1.3 Airservices Perth Airport LSI



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1113165)							
EP1710035-002	SB1715_0.1_0.5	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	92.6	74	125
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	108	71	125
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1113176)							
EP1710076-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	85.2	74	125
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	95.7	71	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1113166)							
EP1710035-002	SB1715_0.1_0.5	EP071: C10 - C14 Fraction	----	1286 mg/kg	108	65	126
		EP071: C15 - C28 Fraction	----	2920 mg/kg	108	62	124
		EP071: C29 - C36 Fraction	----	400 mg/kg	104	65	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1113175)							
EP1710076-002	Anonymous	EP071: C10 - C14 Fraction	----	1286 mg/kg	105	65	126
		EP071: C15 - C28 Fraction	----	2920 mg/kg	110	62	124
		EP071: C29 - C36 Fraction	----	400 mg/kg	117	65	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1113191)							
EP1710035-002	SB1715_0.1_0.5	EP080: C6 - C9 Fraction	----	24 mg/kg	99.8	69	135
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1113196)							
EP1710035-040	LR TBS395	EP080: C6 - C9 Fraction	----	24 mg/kg	128	69	135
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1113166)							
EP1710035-002	SB1715_0.1_0.5	EP071: >C10 - C16 Fraction	----	2022 mg/kg	110	65	126
		EP071: >C16 - C34 Fraction	----	2349 mg/kg	103	62	124
		EP071: >C34 - C40 Fraction	----	129 mg/kg	87.2	65	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1113175)							
EP1710076-002	Anonymous	EP071: >C10 - C16 Fraction	----	2022 mg/kg	105	65	126
		EP071: >C16 - C34 Fraction	----	2349 mg/kg	115	62	124
		EP071: >C34 - C40 Fraction	----	129 mg/kg	131	65	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1113191)							
EP1710035-002	SB1715_0.1_0.5	EP080: C6 - C10 Fraction	C6_C10	29 mg/kg	99.1	69	135
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1113196)							
EP1710035-040	LR TBS395	EP080: C6 - C10 Fraction	C6_C10	29 mg/kg	125	69	135
EP080: BTEXN (QCLot: 1113191)							
EP1710035-002	SB1715_0.1_0.5	EP080: Benzene	71-43-2	2 mg/kg	103	76	118
		EP080: Toluene	108-88-3	2 mg/kg	87.4	67	112
EP080: BTEXN (QCLot: 1113196)							
EP1710035-040	LR TBS395	EP080: Benzene	71-43-2	2 mg/kg	116	76	118
		EP080: Toluene	108-88-3	2 mg/kg	112	67	112



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1113511)							
EP1710035-001	SB1715_0.0_0.1	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	62.8	50	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	114	50	130
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	80.9	50	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	104	50	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	# Not Determined	50	130
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	128	50	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1113515)							
EB1718842-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	120	50	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	107	50	130
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	# Not Determined	50	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	109	50	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	# Not Determined	50	130
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	61.2	50	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1118810)							
EM1712542-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	62.4	50	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	58.6	50	130
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	50.3	50	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	59.2	50	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	56.0	50	130
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	90.7	50	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1125702)							
EP1710035-014	SB1717_0.1_0.5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	105	50	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	125	50	130
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	130	50	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	122	50	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	# Not Determined	50	130
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	107	50	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1113511)							
EP1710035-001	SB1715_0.0_0.1	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	99.7	30	130
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	69.9	50	130
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	53.4	50	130
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	81.6	50	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	104	50	130
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	107	50	130



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1113511) - continued							
EP1710035-001	SB1715_0.0_0.1	EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	112	50	130
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	113	50	130
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	81.0	50	130
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	86.7	30	130
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	79.0	30	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1113515)							
EB1718842-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	104	30	130
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	102	50	130
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	# Not Determined	50	130
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	120	50	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	130	50	130
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	106	50	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	107	50	130
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	105	50	130
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	106	50	130
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	79.9	30	130
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	92.9	30	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1118810)							
EM1712542-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	74.4	30	130
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	57.9	50	130
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	53.6	50	130
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	61.3	50	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	65.8	50	130
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	57.3	50	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	55.9	50	130
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	51.5	50	130
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	51.8	50	130
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	105	30	130
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	66.2	30	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1125702)							
EP1710035-014	SB1717_0.1_0.5	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	82.0	30	130
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	84.4	50	130
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	114	50	130
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	103	50	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	80.4	50	130
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	99.9	50	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	101	50	130



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1125702) - continued							
EP1710035-014	SB1717_0.1_0.5	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	84.6	50	130
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	92.3	50	130
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	73.2	30	130
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	70.1	30	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1113511)							
EP1710035-001	SB1715_0.0_0.1	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	56.7	50	130
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	97.8	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	84.0	30	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.00312 mg/kg	61.6	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	62.1	30	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	117	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	118	30	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1113515)							
EB1718842-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	125	50	130
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	103	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	92.5	30	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.00312 mg/kg	59.9	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	90.5	30	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	127	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	87.9	30	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1118810)							
EM1712542-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	51.8	50	130
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	48.1	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	55.7	30	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.00312 mg/kg	62.2	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	45.4	30	130



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1118810) - continued							
EM1712542-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	89.1	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	65.5	30	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1125702)							
EP1710035-014	SB1717_0.1_0.5	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	128	50	130
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	76.5	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	35.7	30	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.00312 mg/kg	102	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	121	30	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	114	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	98.4	30	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1113511)							
EP1710035-001	SB1715_0.0_0.1	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	109	50	130
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	103	50	130
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	117	50	130
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	98.5	50	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1113515)							
EB1718842-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	101	50	130
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	109	50	130
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	101	50	130
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	109	50	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1118810)							
EM1712542-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	88.3	50	130
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	67.7	50	130
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	63.8	50	130
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	66.0	50	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1125702)							
EP1710035-014	SB1717_0.1_0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	105	50	130
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	94.9	50	130
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	96.2	50	130
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	63.8	50	130
Sub-Matrix: WATER				Matrix Spike (MS) Report			



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1113242)							
EP1710070-008	Anonymous	EP071: C10 - C14 Fraction	----	385 µg/L	71.4	45	122
		EP071: C15 - C28 Fraction	----	385 µg/L	95.1	55	143
		EP071: C29 - C36 Fraction	----	398 µg/L	73.7	54	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1119542)							
EP1710035-038	SQA07_120917	EP080: C6 - C9 Fraction	----	240 µg/L	82.9	77	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1113242)							
EP1710070-008	Anonymous	EP071: >C10 - C16 Fraction	----	380 µg/L	77.4	45	122
		EP071: >C16 - C34 Fraction	----	597 µg/L	84.0	55	143
		EP071: >C34 - C40 Fraction	----	168 µg/L	87.7	54	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1119542)							
EP1710035-038	SQA07_120917	EP080: C6 - C10 Fraction	C6_C10	290 µg/L	91.8	77	137
EP080: BTEXN (QCLot: 1119542)							
EP1710035-038	SQA07_120917	EP080: Benzene	71-43-2	20 µg/L	91.3	77	122
		EP080: Toluene	108-88-3	20 µg/L	100	74	126
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1113520)							
EM1712339-010	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.5 µg/L	88.2	50	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.5 µg/L	99.4	50	130
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.5 µg/L	95.8	50	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.5 µg/L	92.0	50	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.5 µg/L	98.2	50	130
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.5 µg/L	98.6	50	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1113520)							
EM1712339-010	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	2.5 µg/L	104	50	130
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.5 µg/L	88.6	50	130
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.5 µg/L	99.0	50	130
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.5 µg/L	94.0	50	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.5 µg/L	103	50	130
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.5 µg/L	88.2	50	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.5 µg/L	97.8	50	130
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.5 µg/L	90.6	50	130
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.5 µg/L	96.8	50	130
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.5 µg/L	94.8	50	130
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	1.25 µg/L	104	50	150
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1113520)							
EM1712339-010	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.5 µg/L	92.0	50	130
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	1.25 µg/L	96.9	50	150



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1113520) - continued							
EM1712339-010	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	1.25 µg/L	93.0	50	150
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	1.25 µg/L	106	50	150
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	1.25 µg/L	98.2	50	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.5 µg/L	90.8	50	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.5 µg/L	110	50	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1113520)							
EM1712339-010	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.5 µg/L	99.8	50	130
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.5 µg/L	101	50	130
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.5 µg/L	114	50	130
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.5 µg/L	87.8	50	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EP1710035	Page	: 1 of 14
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Perth
Contact	: < first name > < last name >	Telephone	: +61-8-9209 7655
Project	: 60543717.1.3 Airservices Perth Airport LSI	Date Samples Received	: 12-Sep-2017
Site	: ----	Issue Date	: 25-Sep-2017
Sampler	: [REDACTED]	No. of samples received	: 64
Order number	: 60543717.1.3	No. of samples analysed	: 35

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EB1718842--001	Anonymous	Perfluorohexane sulfonic acid (PFHxS)	355-46-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EP1710035--001	SB1715_0.0_0.1	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EB1718842--001	Anonymous	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EP1710035--014	SB1717_0.1_0.5	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	EB1718842--001	Anonymous	Perfluorohexanoic acid (PFHxA)	307-24-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Matrix: WATER

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	7	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	7	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

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.

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.

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

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
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055)		12-Sep-2017	----	----	----	18-Sep-2017	26-Sep-2017	✓
SB1715_0.0_0.1,	SB1715_0.1_0.5,							
SB1716_0.0_0.1,	SB1716_0.1_0.5,							
SB1717_0.0_0.1,	SB1717_0.1_0.5,							
SB1718_0.0_0.1,	SB1718_0.1_0.5,							
SB1719_0.0_0.1,	SB1719_0.1_0.5,							
SB1720_0.0_0.1,	SB1720_0.1_0.5,							
SB1721_0.0_0.1,	SB1721_0.1_0.5,							
SQA01_120917,	SQA06_120917,							
LR TBS395,	LR TBS398,							
LR TBS399,	SB1722_0.0_0.1,							
SB1722_0.1_0.5,	SB1723_0.0_0.1,							
SB1723_0.1_0.5,	SB1724_0.0_0.1,							
SB1724_0.1_0.5,	SB1725_0.0_0.1,							
SB1725_0.1_0.5								
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075(SIM))		12-Sep-2017	15-Sep-2017	26-Sep-2017	✓	18-Sep-2017	25-Oct-2017	✓
SB1715_0.0_0.1,	SB1715_0.1_0.5,							
SB1716_0.0_0.1,	SB1716_0.1_0.5,							
SB1717_0.0_0.1,	SB1717_0.1_0.5,							
SB1718_0.0_0.1,	SB1718_0.1_0.5,							
SB1719_0.0_0.1,	SB1719_0.1_0.5,							
SB1720_0.0_0.1,	SB1720_0.1_0.5,							
SB1721_0.0_0.1,	SB1721_0.1_0.5,							
SQA01_120917,	SQA06_120917,							
SB1722_0.0_0.1,	SB1722_0.1_0.5,							
SB1723_0.0_0.1,	SB1723_0.1_0.5							
Soil Glass Jar - Unpreserved (EP075(SIM))		12-Sep-2017	19-Sep-2017	26-Sep-2017	✓	19-Sep-2017	29-Oct-2017	✓
SB1724_0.0_0.1,	SB1724_0.1_0.5,							
SB1725_0.0_0.1,	SB1725_0.1_0.5							



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
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080)								
SB1724_0.0_0.1, SB1725_0.0_0.1,	SB1724_0.1_0.5, SB1725_0.1_0.5	12-Sep-2017	15-Sep-2017	26-Sep-2017	✔	15-Sep-2017	26-Sep-2017	✔
Soil Glass Jar - Unpreserved (EP071)								
SB1715_0.0_0.1, SB1716_0.0_0.1, SB1717_0.0_0.1, SB1718_0.0_0.1, SB1719_0.0_0.1, SB1720_0.0_0.1, SB1721_0.0_0.1, SQA01_120917, SB1722_0.0_0.1, SB1723_0.0_0.1,	SB1715_0.1_0.5, SB1716_0.1_0.5, SB1717_0.1_0.5, SB1718_0.1_0.5, SB1719_0.1_0.5, SB1720_0.1_0.5, SB1721_0.1_0.5, SQA06_120917, SB1722_0.1_0.5, SB1723_0.1_0.5	12-Sep-2017	15-Sep-2017	26-Sep-2017	✔	18-Sep-2017	25-Oct-2017	✔
Soil Glass Jar - Unpreserved (EP080)								
SB1715_0.0_0.1, SB1716_0.0_0.1, SB1717_0.0_0.1, SB1718_0.0_0.1, SB1719_0.0_0.1, SB1720_0.0_0.1, SB1721_0.0_0.1, SQA01_120917, SB1722_0.0_0.1, SB1723_0.0_0.1,	SB1715_0.1_0.5, SB1716_0.1_0.5, SB1717_0.1_0.5, SB1718_0.1_0.5, SB1719_0.1_0.5, SB1720_0.1_0.5, SB1721_0.1_0.5, SQA06_120917, SB1722_0.1_0.5, SB1723_0.1_0.5	12-Sep-2017	18-Sep-2017	26-Sep-2017	✔	18-Sep-2017	26-Sep-2017	✔
Soil Glass Jar - Unpreserved (EP071)								
SB1724_0.0_0.1, SB1725_0.0_0.1,	SB1724_0.1_0.5, SB1725_0.1_0.5	12-Sep-2017	19-Sep-2017	26-Sep-2017	✔	19-Sep-2017	29-Oct-2017	✔



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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP080)								
SB1724_0.0_0.1, SB1725_0.0_0.1,	SB1724_0.1_0.5, SB1725_0.1_0.5	12-Sep-2017	15-Sep-2017	26-Sep-2017	✔	15-Sep-2017	26-Sep-2017	✔
Soil Glass Jar - Unpreserved (EP071)								
SB1715_0.0_0.1, SB1716_0.0_0.1, SB1717_0.0_0.1, SB1718_0.0_0.1, SB1719_0.0_0.1, SB1720_0.0_0.1, SB1721_0.0_0.1, SQA01_120917, SB1722_0.0_0.1, SB1723_0.0_0.1,	SB1715_0.1_0.5, SB1716_0.1_0.5, SB1717_0.1_0.5, SB1718_0.1_0.5, SB1719_0.1_0.5, SB1720_0.1_0.5, SB1721_0.1_0.5, SQA06_120917, SB1722_0.1_0.5, SB1723_0.1_0.5	12-Sep-2017	15-Sep-2017	26-Sep-2017	✔	18-Sep-2017	25-Oct-2017	✔
Soil Glass Jar - Unpreserved (EP080)								
SB1715_0.0_0.1, SB1716_0.0_0.1, SB1717_0.0_0.1, SB1718_0.0_0.1, SB1719_0.0_0.1, SB1720_0.0_0.1, SB1721_0.0_0.1, SQA01_120917, SB1722_0.0_0.1, SB1723_0.0_0.1,	SB1715_0.1_0.5, SB1716_0.1_0.5, SB1717_0.1_0.5, SB1718_0.1_0.5, SB1719_0.1_0.5, SB1720_0.1_0.5, SB1721_0.1_0.5, SQA06_120917, SB1722_0.1_0.5, SB1723_0.1_0.5	12-Sep-2017	18-Sep-2017	26-Sep-2017	✔	18-Sep-2017	26-Sep-2017	✔
Soil Glass Jar - Unpreserved (EP071)								
SB1724_0.0_0.1, SB1725_0.0_0.1,	SB1724_0.1_0.5, SB1725_0.1_0.5	12-Sep-2017	19-Sep-2017	26-Sep-2017	✔	19-Sep-2017	29-Oct-2017	✔



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
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080)		12-Sep-2017	15-Sep-2017	26-Sep-2017	✓	15-Sep-2017	26-Sep-2017	✓
LR TBS395,	LR TBS398,							
LR TBS399,	SB1724_0.0_0.1,							
SB1724_0.1_0.5,	SB1725_0.0_0.1,							
SB1725_0.1_0.5								
Soil Glass Jar - Unpreserved (EP080)		12-Sep-2017	18-Sep-2017	26-Sep-2017	✓	18-Sep-2017	26-Sep-2017	✓
SB1715_0.0_0.1,	SB1715_0.1_0.5,							
SB1716_0.0_0.1,	SB1716_0.1_0.5,							
SB1717_0.0_0.1,	SB1717_0.1_0.5,							
SB1718_0.0_0.1,	SB1718_0.1_0.5,							
SB1719_0.0_0.1,	SB1719_0.1_0.5,							
SB1720_0.0_0.1,	SB1720_0.1_0.5,							
SB1721_0.0_0.1,	SB1721_0.1_0.5,							
SQA01_120917,	SQA06_120917,							
SB1722_0.0_0.1,	SB1722_0.1_0.5,							
SB1723_0.0_0.1,	SB1723_0.1_0.5							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)		12-Sep-2017	15-Sep-2017	11-Mar-2018	✓	15-Sep-2017	25-Oct-2017	✓
SB1725_0.1_0.5								
HDPE Soil Jar (EP231X)		12-Sep-2017	19-Sep-2017	11-Mar-2018	✓	19-Sep-2017	29-Oct-2017	✓
SB1715_0.0_0.1,	SB1715_0.1_0.5,							
SB1716_0.0_0.1,	SB1716_0.1_0.5,							
SB1717_0.0_0.1,	SB1718_0.0_0.1,							
SB1718_0.1_0.5,	SB1719_0.0_0.1,							
SB1719_0.1_0.5,	SB1720_0.0_0.1,							
SB1720_0.1_0.5,	SB1721_0.0_0.1,							
SB1721_0.1_0.5,	SQA01_120917,							
SQA06_120917,	SB1722_0.0_0.1,							
SB1722_0.1_0.5,	SB1723_0.0_0.1,							
SB1723_0.1_0.5,	SB1724_0.0_0.1,							
SB1724_0.1_0.5,	SB1725_0.0_0.1							
HDPE Soil Jar (EP231X)		12-Sep-2017	21-Sep-2017	11-Mar-2018	✓	21-Sep-2017	31-Oct-2017	✓
SB1717_0.1_0.5								



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
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) SB1725_0.1_0.5		12-Sep-2017	15-Sep-2017	11-Mar-2018	✓	15-Sep-2017	25-Oct-2017	✓
HDPE Soil Jar (EP231X) SB1715_0.0_0.1, SB1716_0.0_0.1, SB1717_0.0_0.1, SB1718_0.1_0.5, SB1719_0.1_0.5, SB1720_0.1_0.5, SB1721_0.1_0.5, SQA06_120917, SB1722_0.1_0.5, SB1723_0.1_0.5, SB1724_0.1_0.5, SB1725_0.0_0.1	SB1715_0.1_0.5, SB1716_0.1_0.5, SB1718_0.0_0.1, SB1719_0.0_0.1, SB1720_0.0_0.1, SB1721_0.0_0.1, SQA01_120917, SB1722_0.0_0.1, SB1723_0.0_0.1, SB1724_0.0_0.1, SB1725_0.0_0.1	12-Sep-2017	19-Sep-2017	11-Mar-2018	✓	19-Sep-2017	29-Oct-2017	✓
HDPE Soil Jar (EP231X) SB1717_0.1_0.5		12-Sep-2017	21-Sep-2017	11-Mar-2018	✓	21-Sep-2017	31-Oct-2017	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X) SB1725_0.1_0.5		12-Sep-2017	15-Sep-2017	11-Mar-2018	✓	15-Sep-2017	25-Oct-2017	✓
HDPE Soil Jar (EP231X) SB1715_0.0_0.1, SB1716_0.0_0.1, SB1717_0.0_0.1, SB1718_0.1_0.5, SB1719_0.1_0.5, SB1720_0.1_0.5, SB1721_0.1_0.5, SQA06_120917, SB1722_0.1_0.5, SB1723_0.1_0.5, SB1724_0.1_0.5, SB1725_0.0_0.1	SB1715_0.1_0.5, SB1716_0.1_0.5, SB1718_0.0_0.1, SB1719_0.0_0.1, SB1720_0.0_0.1, SB1721_0.0_0.1, SQA01_120917, SB1722_0.0_0.1, SB1723_0.0_0.1, SB1724_0.0_0.1, SB1725_0.0_0.1	12-Sep-2017	19-Sep-2017	11-Mar-2018	✓	19-Sep-2017	29-Oct-2017	✓
HDPE Soil Jar (EP231X) SB1717_0.1_0.5		12-Sep-2017	21-Sep-2017	11-Mar-2018	✓	21-Sep-2017	31-Oct-2017	✓



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
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X) SB1725_0.1_0.5		12-Sep-2017	15-Sep-2017	11-Mar-2018	✓	15-Sep-2017	25-Oct-2017	✓
HDPE Soil Jar (EP231X) SB1715_0.0_0.1, SB1716_0.1_0.5, SB1717_0.0_0.1, SB1718_0.1_0.5, SB1719_0.1_0.5, SB1720_0.1_0.5, SB1721_0.1_0.5, SQA06_120917, SB1722_0.1_0.5, SB1723_0.1_0.5, SB1724_0.1_0.5, SB1725_0.0_0.1		12-Sep-2017	19-Sep-2017	11-Mar-2018	✓	19-Sep-2017	29-Oct-2017	✓
HDPE Soil Jar (EP231X) SB1717_0.1_0.5		12-Sep-2017	21-Sep-2017	11-Mar-2018	✓	21-Sep-2017	31-Oct-2017	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X) SB1725_0.1_0.5		12-Sep-2017	15-Sep-2017	11-Mar-2018	✓	15-Sep-2017	25-Oct-2017	✓
HDPE Soil Jar (EP231X) SB1715_0.0_0.1, SB1716_0.0_0.1, SB1717_0.0_0.1, SB1718_0.1_0.5, SB1719_0.1_0.5, SB1720_0.1_0.5, SB1721_0.1_0.5, SQA06_120917, SB1722_0.1_0.5, SB1723_0.1_0.5, SB1724_0.1_0.5, SB1725_0.0_0.1		12-Sep-2017	19-Sep-2017	11-Mar-2018	✓	19-Sep-2017	29-Oct-2017	✓
HDPE Soil Jar (EP231X) SB1717_0.1_0.5		12-Sep-2017	21-Sep-2017	11-Mar-2018	✓	21-Sep-2017	31-Oct-2017	✓

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Amber Glass Bottle - Unpreserved (EP075(SIM))		12-Sep-2017	14-Sep-2017	19-Sep-2017	✓	15-Sep-2017	24-Oct-2017	✓
SQA07_120917, SW1721_120917, SW1724_120917, WQA01_120917	SQA08_120917, SW1723_120917, SW1722_120917,							
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved (EP071)		12-Sep-2017	14-Sep-2017	19-Sep-2017	✓	15-Sep-2017	24-Oct-2017	✓
SQA07_120917, SW1721_120917, SW1724_120917, WQA01_120917	SQA08_120917, SW1723_120917, SW1722_120917,							
Amber VOC Vial - Sulfuric Acid (EP080)		12-Sep-2017	19-Sep-2017	26-Sep-2017	✓	19-Sep-2017	26-Sep-2017	✓
SQA07_120917, SW1721_120917, SW1724_120917, LR TBW824,	SQA08_120917, SW1723_120917, SW1722_120917, WQA01_120917							
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Amber Glass Bottle - Unpreserved (EP071)		12-Sep-2017	14-Sep-2017	19-Sep-2017	✓	15-Sep-2017	24-Oct-2017	✓
SQA07_120917, SW1721_120917, SW1724_120917, WQA01_120917	SQA08_120917, SW1723_120917, SW1722_120917,							
Amber VOC Vial - Sulfuric Acid (EP080)		12-Sep-2017	19-Sep-2017	26-Sep-2017	✓	19-Sep-2017	26-Sep-2017	✓
SQA07_120917, SW1721_120917, SW1724_120917, LR TBW824,	SQA08_120917, SW1723_120917, SW1722_120917, WQA01_120917							
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080)		12-Sep-2017	19-Sep-2017	26-Sep-2017	✓	19-Sep-2017	26-Sep-2017	✓
SQA07_120917, SW1721_120917, SW1724_120917, LR TBW824,	SQA08_120917, SW1723_120917, SW1722_120917, WQA01_120917							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)		12-Sep-2017	----	----	----	18-Sep-2017	11-Mar-2018	✓
SQA07_120917, SW1721_120917, SW1724_120917, WQA01_120917	SQA08_120917, SW1723_120917, SW1722_120917,							



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) SQA07_120917, SQA08_120917, SW1721_120917, SW1723_120917, SW1724_120917, SW1722_120917, WQA01_120917	12-Sep-2017	----	----	----	18-Sep-2017	11-Mar-2018	✔
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) SQA07_120917, SQA08_120917, SW1721_120917, SW1723_120917, SW1724_120917, SW1722_120917, WQA01_120917	12-Sep-2017	----	----	----	18-Sep-2017	11-Mar-2018	✔
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) SQA07_120917, SQA08_120917, SW1721_120917, SW1723_120917, SW1724_120917, SW1722_120917, WQA01_120917	12-Sep-2017	----	----	----	18-Sep-2017	11-Mar-2018	✔
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) SQA07_120917, SQA08_120917, SW1721_120917, SW1723_120917, SW1724_120917, SW1722_120917, WQA01_120917	12-Sep-2017	----	----	----	18-Sep-2017	11-Mar-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)							
Moisture Content	EA055	3	27	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	3	27	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	5	32	15.63	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	3	27	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	3	27	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	2	27	7.41	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	32	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	27	7.41	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	27	7.41	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	2	27	7.41	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	32	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	27	7.41	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	27	7.41	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	2	27	7.41	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	32	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	27	7.41	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	27	7.41	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	16	12.50	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	18	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	0.00	5.00	✗	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.
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. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In house: Direct injection analysis of fresh waters after dilution (1:1) with methanol. Analysis by LC-Electrospray-MS-MS, Negative Mode using MRM. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.
Preparation Methods	Method	Matrix	Method Descriptions
Sample Extraction for PFAS	EP231-PR	SOIL	In house
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

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Work Order : EP1710035
Client : AECOM Australia Pty Ltd
Project : 60543717.1.3 Airservices Perth Airport LSI



Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP1710035**

Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Perth
Contact	: < first name > < last name >	Contact	: [REDACTED]
Address	: LEVEL 6 3 FORREST PLACE PERTH WA, AUSTRALIA 6849	Address	: 10 Hod Way Malaga WA Australia 6090
E-mail	: [REDACTED]	E-mail	: [REDACTED]
Telephone	: +61 08 6208 0000	Telephone	: +61-8-9209 7655
Facsimile	: +61 08 6208 0999	Facsimile	: +61-8-9209 7600
Project	: 60543717.1.3 Airservices Perth Airport LSI	Page	: 1 of 4
Order number	: 60543717.1.3	Quote number	: EP2017AECOMAU0004 (EP/541/17)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: [REDACTED]		

Dates

Date Samples Received	: 12-Sep-2017 17:00	Issue Date	: 13-Sep-2017
Client Requested Due Date	: 20-Sep-2017	Scheduled Reporting Date	: 20-Sep-2017

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 4	Temperature	: 3.8 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 65 / 35

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (SamplesPerth@alsenviro.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of Work Order.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**



Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

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

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

Matrix: SOIL

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP080 BTEXN	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)	SOIL - S-07 TRH/BTEXN/PAH (SIM)
EP1710035-001	12-Sep-2017 00:00	SB1715_0.0_0.1		✓		✓	✓
EP1710035-002	12-Sep-2017 00:00	SB1715_0.1_0.5		✓		✓	✓
EP1710035-003	12-Sep-2017 00:00	SB1715_0.8_1.0	✓				
EP1710035-004	12-Sep-2017 00:00	SB1715_1.3_1.5	✓				
EP1710035-005	12-Sep-2017 00:00	SB1716_0.0_0.1		✓		✓	✓
EP1710035-006	12-Sep-2017 00:00	SB1716_0.1_0.5		✓		✓	✓
EP1710035-007	12-Sep-2017 00:00	SB1716_0.8_1.0	✓				
EP1710035-008	12-Sep-2017 00:00	SB1716_1.3_1.5	✓				
EP1710035-009	12-Sep-2017 00:00	SB1716_1.8_2.0	✓				
EP1710035-010	12-Sep-2017 00:00	SB1716_2.3_2.5	✓				
EP1710035-011	12-Sep-2017 00:00	SB1716_2.8_3.0	✓				
EP1710035-012	12-Sep-2017 00:00	SB1716_3.3_3.5	✓				
EP1710035-013	12-Sep-2017 00:00	SB1717_0.0_0.1		✓		✓	✓
EP1710035-014	12-Sep-2017 00:00	SB1717_0.1_0.5		✓			✓
EP1710035-015	12-Sep-2017 00:00	SB1717_0.8_1.0	✓				
EP1710035-016	12-Sep-2017 00:00	SB1717_1.3_1.5	✓				
EP1710035-017	12-Sep-2017 00:00	SB1717_1.8_2.0	✓				
EP1710035-018	12-Sep-2017 00:00	SB1718_0.0_0.1		✓		✓	✓
EP1710035-019	12-Sep-2017 00:00	SB1718_0.1_0.5		✓		✓	✓
EP1710035-020	12-Sep-2017 00:00	SB1718_0.8_1.0	✓				
EP1710035-021	12-Sep-2017 00:00	SB1718_1.3_1.5	✓				
EP1710035-022	12-Sep-2017 00:00	SB1719_0.0_0.1		✓		✓	✓
EP1710035-023	12-Sep-2017 00:00	SB1719_0.1_0.5		✓		✓	✓
EP1710035-024	12-Sep-2017 00:00	SB1719_0.8_1.0	✓				
EP1710035-025	12-Sep-2017 00:00	SB1719_1.3_1.5	✓				
EP1710035-026	12-Sep-2017 00:00	SB1720_0.0_0.1		✓		✓	✓
EP1710035-027	12-Sep-2017 00:00	SB1720_0.1_0.5		✓		✓	✓
EP1710035-028	12-Sep-2017 00:00	SB1720_0.8_1.0	✓				
EP1710035-029	12-Sep-2017 00:00	SB1720_1.3_1.5	✓				
EP1710035-030	12-Sep-2017 00:00	SB1721_0.0_0.1		✓		✓	✓
EP1710035-031	12-Sep-2017 00:00	SB1721_0.1_0.5		✓		✓	✓
EP1710035-032	12-Sep-2017 00:00	SB1721_0.8_1.0	✓				
EP1710035-033	12-Sep-2017 00:00	SB1721_1.3_1.5	✓				
EP1710035-034	12-Sep-2017 00:00	SQA01_120917		✓		✓	✓
EP1710035-035	12-Sep-2017 00:00	SQA03_120917	✓				



			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP080 BTEXN	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)	SOIL - S-07 TRH/BTEXN/PAH (SIM)
EP1710035-036	12-Sep-2017 00:00	SQA04_120917	✓				
EP1710035-037	12-Sep-2017 00:00	SQA06_120917		✓		✓	✓
EP1710035-040	12-Sep-2017 00:00	LR TBS395		✓	✓		
EP1710035-041	12-Sep-2017 00:00	LR TBS398		✓	✓		
EP1710035-042	12-Sep-2017 00:00	LR TBS399		✓	✓		
EP1710035-043	12-Sep-2017 00:00	SB1722_0.0_0.1		✓		✓	✓
EP1710035-044	12-Sep-2017 00:00	SB1722_0.1_0.5		✓		✓	✓
EP1710035-045	12-Sep-2017 00:00	SB1722_0.8_1.0	✓				
EP1710035-046	12-Sep-2017 00:00	SB1722_1.3_1.5	✓				
EP1710035-047	12-Sep-2017 00:00	SB1723_0.0_0.1		✓		✓	✓
EP1710035-048	12-Sep-2017 00:00	SB1723_0.1_0.5		✓		✓	✓
EP1710035-049	12-Sep-2017 00:00	SB1723_0.8_1.0	✓				
EP1710035-050	12-Sep-2017 00:00	SB1723_1.3_1.5	✓				
EP1710035-051	12-Sep-2017 00:00	SB1724_0.0_0.1		✓		✓	✓
EP1710035-052	12-Sep-2017 00:00	SB1724_0.1_0.5		✓		✓	✓
EP1710035-053	12-Sep-2017 00:00	SB1724_0.8_1.0	✓				
EP1710035-054	12-Sep-2017 00:00	SB1724_1.3_1.5	✓				
EP1710035-055	12-Sep-2017 00:00	SB1724_1.8_2.0	✓				
EP1710035-056	12-Sep-2017 00:00	SB1725_0.0_0.1		✓		✓	✓
EP1710035-057	12-Sep-2017 00:00	SB1725_0.1_0.5		✓		✓	✓
EP1710035-058	12-Sep-2017 00:00	SB1725_0.8_1.0	✓				
EP1710035-059	12-Sep-2017 00:00	SB1725_1.3_1.5	✓				

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - W-07 TRH/BTEXN/PAH
EP1710035-038	12-Sep-2017 00:00	SQA07_120917	✓	✓
EP1710035-039	12-Sep-2017 00:00	SQA08_120917	✓	✓
EP1710035-060	12-Sep-2017 00:00	SW1721_120917	✓	✓
EP1710035-061	12-Sep-2017 00:00	SW1723_120917	✓	✓
EP1710035-062	12-Sep-2017 00:00	SW1724_120917	✓	✓
EP1710035-063	12-Sep-2017 00:00	SW1722_120917	✓	✓
EP1710035-065	12-Sep-2017 00:00	WQA01_120917	✓	✓



Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	
EP1710035-064	12-Sep-2017 00:00	LR TBW824	✓

WATER - W-18
 TRH(C6 - C9)/BTEXN

Proactive Holding Time Report

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

Requested Deliverables

< first name > < last name >

- *AU Certificate of Analysis - NATA (COA) Email
- *AU Certificate of Analysis - NATA (With MU) (COA_MU) Email
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) Email
- Chain of Custody (CoC) (COC) Email
- EDI Format - ENMRG (ENMRG) Email
- EDI Format - ESDAT (ESDAT) Email
- EDI Format - XTab (XTAB) Email

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV) Email

[REDACTED]

- A4 - AU Tax Invoice (INV) Email

[REDACTED]

[REDACTED]

[REDACTED]

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP1710035**

Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Perth
Contact	: < first name > < last name >	Contact	: [REDACTED]
Address	: LEVEL 6 3 FORREST PLACE PERTH WA, AUSTRALIA 6849	Address	: 10 Hod Way Malaga WA Australia 6090
E-mail	: [REDACTED]	E-mail	: [REDACTED]
Telephone	: +61 08 6208 0000	Telephone	: +61-8-9209 7655
Facsimile	: +61 08 6208 0999	Facsimile	: +61-8-9209 7600
Project	: 60543717.1.3 Airservices Perth Airport LSI	Page	: 1 of 4
Order number	: 60543717.1.3	Quote number	: EP2017AECOMAU0004 (EP/541/17)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: [REDACTED]		

Dates

Date Samples Received	: 12-Sep-2017 17:00	Issue Date	: 20-Sep-2017
Client Requested Due Date	: 20-Sep-2017	Scheduled Reporting Date	: 20-Sep-2017

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 4	Temperature	: 3.8 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 64 / 35

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (SamplesPerth@alsenviro.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of Work Order.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**



Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

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

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

Matrix: SOIL

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP080 BTEXN	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)	SOIL - S-07 TRH/BTEXN/PAH (SIM)
EP1710035-001	12-Sep-2017 00:00	SB1715_0.0_0.1		✓		✓	✓
EP1710035-002	12-Sep-2017 00:00	SB1715_0.1_0.5		✓		✓	✓
EP1710035-003	12-Sep-2017 00:00	SB1715_0.8_1.0	✓				
EP1710035-004	12-Sep-2017 00:00	SB1715_1.3_1.5	✓				
EP1710035-005	12-Sep-2017 00:00	SB1716_0.0_0.1		✓		✓	✓
EP1710035-006	12-Sep-2017 00:00	SB1716_0.1_0.5		✓		✓	✓
EP1710035-007	12-Sep-2017 00:00	SB1716_0.8_1.0	✓				
EP1710035-008	12-Sep-2017 00:00	SB1716_1.3_1.5	✓				
EP1710035-009	12-Sep-2017 00:00	SB1716_1.8_2.0	✓				
EP1710035-010	12-Sep-2017 00:00	SB1716_2.3_2.5	✓				
EP1710035-011	12-Sep-2017 00:00	SB1716_2.8_3.0	✓				
EP1710035-012	12-Sep-2017 00:00	SB1716_3.3_3.5	✓				
EP1710035-013	12-Sep-2017 00:00	SB1717_0.0_0.1		✓		✓	✓
EP1710035-014	12-Sep-2017 00:00	SB1717_0.1_0.5		✓		✓	✓
EP1710035-016	12-Sep-2017 00:00	SB1717_1.3_1.5	✓				
EP1710035-017	12-Sep-2017 00:00	SB1717_1.8_2.0	✓				
EP1710035-018	12-Sep-2017 00:00	SB1718_0.0_0.1		✓		✓	✓
EP1710035-019	12-Sep-2017 00:00	SB1718_0.1_0.5		✓		✓	✓
EP1710035-020	12-Sep-2017 00:00	SB1718_0.8_1.0	✓				
EP1710035-021	12-Sep-2017 00:00	SB1718_1.3_1.5	✓				
EP1710035-022	12-Sep-2017 00:00	SB1719_0.0_0.1		✓		✓	✓
EP1710035-023	12-Sep-2017 00:00	SB1719_0.1_0.5		✓		✓	✓
EP1710035-024	12-Sep-2017 00:00	SB1719_0.8_1.0	✓				
EP1710035-025	12-Sep-2017 00:00	SB1719_1.3_1.5	✓				
EP1710035-026	12-Sep-2017 00:00	SB1720_0.0_0.1		✓		✓	✓
EP1710035-027	12-Sep-2017 00:00	SB1720_0.1_0.5		✓		✓	✓
EP1710035-028	12-Sep-2017 00:00	SB1720_0.8_1.0	✓				
EP1710035-029	12-Sep-2017 00:00	SB1720_1.3_1.5	✓				
EP1710035-030	12-Sep-2017 00:00	SB1721_0.0_0.1		✓		✓	✓
EP1710035-031	12-Sep-2017 00:00	SB1721_0.1_0.5		✓		✓	✓
EP1710035-032	12-Sep-2017 00:00	SB1721_0.8_1.0	✓				
EP1710035-033	12-Sep-2017 00:00	SB1721_1.3_1.5	✓				
EP1710035-034	12-Sep-2017 00:00	SQA01_120917		✓		✓	✓
EP1710035-035	12-Sep-2017 00:00	SQA03_120917	✓				
EP1710035-036	12-Sep-2017 00:00	SQA04_120917	✓				



			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP080 BTEXN	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)	SOIL - S-07 TRH/BTEXN/PAH (SIM)
EP1710035-037	12-Sep-2017 00:00	SQA06_120917		✓		✓	✓
EP1710035-040	12-Sep-2017 00:00	LR TBS395		✓	✓		
EP1710035-041	12-Sep-2017 00:00	LR TBS398		✓	✓		
EP1710035-042	12-Sep-2017 00:00	LR TBS399		✓	✓		
EP1710035-043	12-Sep-2017 00:00	SB1722_0.0_0.1		✓		✓	✓
EP1710035-044	12-Sep-2017 00:00	SB1722_0.1_0.5		✓		✓	✓
EP1710035-045	12-Sep-2017 00:00	SB1722_0.8_1.0	✓				
EP1710035-046	12-Sep-2017 00:00	SB1722_1.3_1.5	✓				
EP1710035-047	12-Sep-2017 00:00	SB1723_0.0_0.1		✓		✓	✓
EP1710035-048	12-Sep-2017 00:00	SB1723_0.1_0.5		✓		✓	✓
EP1710035-049	12-Sep-2017 00:00	SB1723_0.8_1.0	✓				
EP1710035-050	12-Sep-2017 00:00	SB1723_1.3_1.5	✓				
EP1710035-051	12-Sep-2017 00:00	SB1724_0.0_0.1		✓		✓	✓
EP1710035-052	12-Sep-2017 00:00	SB1724_0.1_0.5		✓		✓	✓
EP1710035-053	12-Sep-2017 00:00	SB1724_0.8_1.0	✓				
EP1710035-054	12-Sep-2017 00:00	SB1724_1.3_1.5	✓				
EP1710035-055	12-Sep-2017 00:00	SB1724_1.8_2.0	✓				
EP1710035-056	12-Sep-2017 00:00	SB1725_0.0_0.1		✓		✓	✓
EP1710035-057	12-Sep-2017 00:00	SB1725_0.1_0.5		✓		✓	✓
EP1710035-058	12-Sep-2017 00:00	SB1725_0.8_1.0	✓				
EP1710035-059	12-Sep-2017 00:00	SB1725_1.3_1.5	✓				

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - W-07 TRH/BTEXN/PAH
EP1710035-038	12-Sep-2017 00:00	SQA07_120917	✓	✓
EP1710035-039	12-Sep-2017 00:00	SQA08_120917	✓	✓
EP1710035-060	12-Sep-2017 00:00	SW1721_120917	✓	✓
EP1710035-061	12-Sep-2017 00:00	SW1723_120917	✓	✓
EP1710035-062	12-Sep-2017 00:00	SW1724_120917	✓	✓
EP1710035-063	12-Sep-2017 00:00	SW1722_120917	✓	✓
EP1710035-065	12-Sep-2017 00:00	WQA01_120917	✓	✓



Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	
EP1710035-064	12-Sep-2017 00:00	LR TBW824	✓

WATER - W-18
 TRH(C6 - C9)/BTEXN

Proactive Holding Time Report

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

Requested Deliverables

< first name > < last name >

- | | | |
|--|-------|--|
| - *AU Certificate of Analysis - NATA (COA) | Email | |
| - *AU Certificate of Analysis - NATA (With MU) (COA_MU) | Email | |
| - *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) | Email | |
| - *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) | Email | |
| - A4 - AU Sample Receipt Notification - Environmental HT (SRN) | Email | |
| - Chain of Custody (CoC) (COC) | Email | |
| - EDI Format - ENMRG (ENMRG) | Email | |
| - EDI Format - ESDAT (ESDAT) | Email | |
| - EDI Format - XTab (XTAB) | Email | |

ACCOUNTS PAYABLE

- | | | |
|-----------------------------|-------|--|
| - A4 - AU Tax Invoice (INV) | Email | |
|-----------------------------|-------|--|

- | | | |
|-----------------------------|-------|--|
| - A4 - AU Tax Invoice (INV) | Email | |
|-----------------------------|-------|--|



CHAIN OF CUSTODY

ALS Laboratory
please tick →

CLIENT: AECOM Services Pty Ltd		TURNAROUND REQUIREMENTS: ☐ Standard TAT (List due date):		FOR LABORATORY USE ONLY (Circle)	
OFFICE:				Custody Seal Intact: ☒ No ☐ N/A	
PROJECT: Abservices Perth Airport LSI		ALS QUOTE NO.:		Free ice / frozen ice break present upon receipt: ☒ No ☐ N/A	
ORDER NUMBER: 60543717.1.3		SY: 02813 V3		Random Sample Temperature on Receipt: 3.8 °C	
PROJECT MANAGER:		SAMPLER MOBILE:		COC SEQUENCE NUMBER (Circle)	
SAMPLER:		SAMPLER MOBILE:		COC: 1 2 3 4 5 6 7	
COC emailed to ALS? YES		EDD FORMAT (or default):		or: 1 2 3 4 5 6 7	
Email Reports to (will default to PM if no other addresses are listed):		Sally Ascoli		RECEIVED BY: MW	
Email Invoice to (will default to PM if no other addresses are listed):		DATE/TIME: 12/09/2017		DATE/TIME: 12/9/17 1700	
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:		RELINQUISHED BY: 46		RELINQUISHED BY:	
		DATE/TIME: 12/09/2017		DATE/TIME:	
				RECEIVED BY:	
				DATE/TIME:	

SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)				CONTAINER INFORMATION		ANALYSIS REQUIRED including RUTES (NB: Suite Codes must be listed to attract same price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)										Additional Information	
LAB ID	APEC 5 SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	EP31X - PFAS Full Suite	S-7 - TRH (C8-C10) TEXMPAH	HOLD	BYEAM (EP360)								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	SB1716_0.0_0.15	12/09/2017	S			X	X										Change interval nomenclature to "0.0_0.1"
2	SB1716_0.3_0.5	12/09/2017	S			X	X										Change interval nomenclature to "0.1_0.5"
3	SB1716_0.8_1.0	12/09/2017	S					X									
4	SB1716_1.3_1.5	12/09/2017	S					X									
5	SB1716_0.0_0.15	12/09/2017	S			X	X										Change interval nomenclature to "0.0_0.1"
6	SB1716_0.3_0.5	12/09/2017	S			X	X										Change interval nomenclature to "0.1_0.5"
7	SB1716_0.8_1.0	12/09/2017	S					X									
8	SB1716_1.3_1.5	12/09/2017	S					X									
9	SB1716_1.8_2.0	12/09/2017	S					X									
10	SB1716_2.3_2.5	12/09/2017	S					X									ERROR (bottle says "SB1716_1.5_1.8_2.0")
11	SB1716_2.8_3.0	12/09/2017	S					X									
12	SB1716_3.3_3.5	12/09/2017	S					X									
13	SB1717_0.0_0.15	12/09/2017	S			X	X										Change interval nomenclature to "0.0_0.1"
14	SB1717_0.3_0.5	12/09/2017	S			X	X										Change interval nomenclature to "0.1_0.5"
15	SB1717_0.8_1.0	12/09/2017	S					X									
16	SB1717_1.3_1.5	12/09/2017	S					X									
17	SB1717_1.8_2.0	12/09/2017	S					X									
18	SB1718_0.0_0.15	12/09/2017	S			X	X										Change interval nomenclature to "0.0_0.1"
19	SB1718_0.3_0.5	12/09/2017	S			X	X										Change interval nomenclature to "0.1_0.5"
20	SB1718_0.8_1.0	12/09/2017	S					X									
21	SB1718_1.3_1.5	12/09/2017	S					X									
22	SB1719_0.0_0.15	12/09/2017	S			X	X										Change interval nomenclature to "0.0_0.1"
23	SB1719_0.3_0.5	12/09/2017	S			X	X										Change interval nomenclature to "0.1_0.5"
24	SB1719_0.8_1.0	12/09/2017	S					X									
25	SB1719_1.3_1.5	12/09/2017	S					X									
26	SB1720_0.0_0.15	12/09/2017	S			X	X										ERROR (bottle says "SB1720_0.0_0.3")
27	SB1720_0.3_0.5	12/09/2017	S			X	X										Change interval nomenclature to "0.1_0.5"
28	SB1720_0.8_1.0	12/09/2017	S					X									Change interval nomenclature to "0.1_0.5"
29	SB1720_1.3_1.5	12/09/2017	S					X									
30	SB1721_0.0_0.15	12/09/2017	S			X	X										Change interval nomenclature to "0.0_0.1"
31	SB1721_0.3_0.5	12/09/2017	S			X	X										Change interval nomenclature to "0.1_0.5"
32	SB1721_0.8_1.0	12/09/2017	S					X									
33	SB1721_1.3_1.5	12/09/2017	S					X									
34	SQA01_120917	12/09/2017	S			X	X										
35	SQA03_120917	12/09/2017	S					X									
36	SQA04_120917	12/09/2017	S					X									
37	SQA06_120917	12/09/2017	S					X									
38	SQA07_120917	12/09/2017	S			X	X										
39	SQA08_120917	12/09/2017	S			X	X										
40	LR TBS396	12/09/2017	S														
41	LR TBS398	12/09/2017	S														
42	LR TBS396	12/09/2017	S														

Environmental Division
Perth

Work Order Reference
EP1710035

Environmental Division
Perth
Work Order Reference
EP1710035



Telephone : - 61-8-9209 7655

Water Container Codes: P = Unpreserved Plastic, N = Acid Preserved Plastic, ORC = Acid Preserved ORC, SH = Sodium Hydroxide Preserved, S = Sodium Hydroxide Preserved Plastic, AD = Amber Glass Unpreserved, AP = Amber Glass Preserved, V = VOA Vial (HCl Preserved), VO = VOA Vial (Sulfuric Acid Preserved), AV = Airtight Unpreserved Vial SG = Sulfuric Acid Preserved Amber Glass, H = HCl Preserved Plastic, HS = HCl Preserved Specimen Box, Z = Zero, Aspartic Acid Bottle, E = EDTA Preserved Bottle, SI = Spill Bottle, ASS = Plastic Bag for Acid Substrate Sample, B = Unpreserved Bag



CHAIN OF CUSTODY

ALS Laboratory
please tick →

LABORATORY: 31 Bluma Road Perth WA 6000
Ph: 08 9441 0177 E: info@als.com.au
JURASSIAN: 1/100 South Street Perth WA 6000
Ph: 08 9441 0177 E: info@als.com.au

LABORATORY: 26 Marston Road Mackay QLD 4740
Ph: 07 5644 0177 E: info@als.com.au
LABORATORY: 1/100 South Street Perth WA 6000
Ph: 08 9441 0177 E: info@als.com.au

LABORATORY: 1/100 South Street Perth WA 6000
Ph: 08 9441 0177 E: info@als.com.au
LABORATORY: 1/100 South Street Perth WA 6000
Ph: 08 9441 0177 E: info@als.com.au

LABORATORY: 1/100 South Street Perth WA 6000
Ph: 08 9441 0177 E: info@als.com.au
LABORATORY: 1/100 South Street Perth WA 6000
Ph: 08 9441 0177 E: info@als.com.au

CLIENT: AECOM Services Pty Ltd		TURNAROUND REQUIREMENTS : ☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):		FOR LABORATORY USE ONLY (Circle)	
OFFICE:				Custody Seal Intact? Yes No N/A	
PROJECT: Aircservices Perth Airport LSI		ALS QUOTE NO.: SY/ 02613 V3		Free ice / frozen ice bricks present upon receipt? Yes No N/A	
ORDER NUMBER: 60543717.1.3				Random Sample Temperature on Receipt: °C	
PROJECT MANAGER:				Other comment:	
SAMPLER:		SAMPLER MOBILE:		RECEIVED BY:	
COC emailed to ALS? (YES / NO)		EDD FORMAT (or default):		RELINQUISHED BY:	
Email Reports to (will default to PM if no other addresses are listed):		DATE/TIME:		DATE/TIME:	
Email Invoice to (will default to PM if no other addresses are listed):		DATE/TIME:		DATE/TIME:	
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:					

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION			ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (fold filtered bottle required).										Additional Information
LAB ID	APEC 4 SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (to codes below)	(refer)	TOTAL CONTAINERS	EP231X - PFAS Full Suite	S-7 - TRH (C6-C40) BTEXNIPAH	HOLD								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
43	SB1722_0.0_0.15	12/09/2017	S				X	X									Change interval nomenclature to "0.0_0.1"
44	SB1722_0.3_0.5	12/09/2017	S				X	X									Change interval nomenclature to "0.1_0.5"
45	SB1722_0.8_1.0	12/09/2017	S						X								
46	SB1722_1.3_1.5	12/09/2017	S						X								
47	SB1723_0.0_0.15	12/09/2017	S				X	X									Change interval nomenclature to "0.0_0.1"
48	SB1723_0.3_0.5	12/09/2017	S				X	X									Change interval nomenclature to "0.1_0.5"
49	SB1723_0.8_1.0	12/09/2017	S						X								
50	SB1723_1.3_1.5	12/09/2017	S						X								
51	SB1724_0.0_0.15	12/09/2017	S				X	X									Change interval nomenclature to "0.0_0.1"
52	SB1724_0.3_0.5	12/09/2017	S				X	X									Change interval nomenclature to "0.1_0.5"
53	SB1724_0.8_1.0	12/09/2017	S						X								
54	SB1724_1.3_1.5	12/09/2017	S						X								
55	SB1724_1.8_2.0	12/09/2017	S						X								
56	SB1725_0.0_0.15	12/09/2017	S				X	X									Change interval nomenclature to "0.0_0.1"
57	SB1725_0.3_0.5	12/09/2017	S				X	X									Change interval nomenclature to "0.1_0.5"
58	SB1725_0.8_1.0	12/09/2017	S						X								
59	SB1725_1.3_1.5	12/09/2017	S						X								

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solids; B = Unpreserved Bag

ALS Laboratory:
please tick →

LAURELDADE 31 Busha Road Horwax 23 4995
 Ph: 07 239 0940 E: laurel@global.com
 WOLFEHANE 22 Sand Street Stafford GLE 4053
 Ph: 07 3543 7272 E: scott@busha@global.com
 LORLAUSTONE 40 Callanish Drive Clinton GLE 45
 Ph: 07 247 5619 E: lorla@global.com

JIMACKAY 72 Harbour Road Mackay QLD 4740
 Ph: 07 4944 0477 E: mackay@ajalys.com
 JANELBOONE 2-1 Varsity Road Springfield QLD 4111
 Ph: 07 3549 9900 E: janelboone@ajalys.com
 LINDSEEE 27 Sydney Road Mudgee NSW 2854
 Ph: 02 8377 6735 E: mudgee@ajalys.com

NEWCASTLE 5 Rose Oak Road Warbrook NSW 2204
Tel: 08 9568 9433 E: samples.newcastle@global.com
DUNFERMLINE 41/3 Cherry Place North Queensferry N. 75-13
PH: 01473 29013 E: news@global.com

PERTH 10 Hod Way Maida WA 6050
PH: 08 9206 7655 E: samples.perth@global.com

DSYONEV 777-289 Woodpark Road Smithfield NSW 2566
 Ph. 02 8754 8585 E. info@dsyonevinternational.com
 DOWNSVILLE 1212 Corona Court Bonville QLD 4816
 Ph: 07 4786 0000 E. downsville.environmentsolutions@gmail.com
 LWOOLLONGONG 99 Henry Street Wollongong NSW 2500
 Ph. 02 4225 3125 E. portkenilbe@dsyonev.com

CLIENT: AECOM Services Pty Ltd

OFFICE: _____

PROJECT: Airservices Perth Airport LSI

ALS QUOTE NO.: SY/02613 V3

COC SEQUENCE NUMBER (Circle)

ORDER NUMBER: 60543717.1.3

PROJECT MANAGER:

SAMPLER MOBILE:

RELINQUISHED BY:

COC emailed to ALS? YES

EDD FORMAT (or default):

Sally Ascott

Email Reports to (will default to PM if no other addresses are listed):

DATE/TIME:

Email Invoice to (will default to PM if no other addresses are listed):

12/09/2017

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE/TIME:

DATE/TIME:

DATE/TIME:

[illegible]

CERTIFICATE OF ANALYSIS

Work Order : **EP1710405**
Client : **AECOM Australia Pty Ltd**
Contact : [REDACTED]
Address : LEVEL 6 3 FORREST PLACE
 PERTH WA, AUSTRALIA 6849

Telephone : ----
Project : 60543717.1.3 Perth Airport Limited Site Investigation
Order number : 60543717.1.3
C-O-C number : ----
Sampler : [REDACTED]
Site : ----
Quote number : EN/004/16
No. of samples received : 12
No. of samples analysed : 12

Page : 1 of 12
Laboratory : Environmental Division Perth
Contact : [REDACTED]
Address : 10 Hod Way Malaga WA Australia 6090

Telephone : +61-8-9209 7655
Date Samples Received : 20-Sep-2017 17:10
Date Analysis Commenced : 26-Sep-2017
Issue Date : 29-Sep-2017 15:45



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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
[REDACTED]	Organic Chemist	Sydney Organics, Smithfield, NSW
[REDACTED]	Graduate Chemist	Perth Organics, Malaga, WA
[REDACTED]	Organic Chemist	Perth Organics, Malaga, WA



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

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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				SW1708_200917	SW1709_200917	SW1714_200917	SW1702_200917	WQA03_200917
Client sampling date / time				[20-Sep-2017]	[20-Sep-2017]	[20-Sep-2017]	[20-Sep-2017]	[20-Sep-2017]
Compound	CAS Number	LOR	Unit	EP1710405-001	EP1710405-002	EP1710405-003	EP1710405-004	EP1710405-005
				Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.07	0.04	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.10	0.05	<0.02	<0.02	0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.96	0.54	0.22	0.10	0.25
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.06	0.03	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	2.25	1.18	0.39	0.07	0.31

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW1708_200917	SW1709_200917	SW1714_200917	SW1702_200917	WQA03_200917
Client sampling date / time				[20-Sep-2017]	[20-Sep-2017]	[20-Sep-2017]	[20-Sep-2017]	[20-Sep-2017]	
Compound	CAS Number	LOR	Unit	EP1710405-001	EP1710405-002	EP1710405-003	EP1710405-004	EP1710405-005	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.05	0.04	<0.02	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.22	0.12	0.05	<0.02	0.03	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.04	0.03	<0.02	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.08	0.05	0.02	<0.01	0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW1708_200917	SW1709_200917	SW1714_200917	SW1702_200917	WQA03_200917
Client sampling date / time					[20-Sep-2017]	[20-Sep-2017]	[20-Sep-2017]	[20-Sep-2017]	[20-Sep-2017]
Compound	CAS Number	LOR	Unit		EP1710405-001	EP1710405-002	EP1710405-003	EP1710405-004	EP1710405-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		3.83	2.08	0.68	0.17	0.62
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		3.21	1.72	0.61	0.17	0.56
Sum of PFAS (WA DER List)	----	0.01	µg/L		3.67	2.00	0.68	0.17	0.60
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%		105	105	107	107	105
Toluene-D8	2037-26-5	2	%		101	98.2	101	97.2	102
4-Bromofluorobenzene	460-00-4	2	%		87.6	86.6	86.9	85.7	86.9
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		115	123	127	122	119



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				SW1710_200917	SW1711_200917	WQA06_200917	SW1705_200917	SW05_200917
Client sampling date / time				[20-Sep-2017]	[20-Sep-2017]	[20-Sep-2017]	[20-Sep-2017]	[20-Sep-2017]
Compound	CAS Number	LOR	Unit	EP1710405-006	EP1710405-007	EP1710405-008	EP1710405-009	EP1710405-010
				Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.18	0.03	<0.02	0.25	0.10
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.26	0.03	<0.01	0.34	0.24

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW1710_200917	SW1711_200917	WQA06_200917	SW1705_200917	SW05_200917
Client sampling date / time				[20-Sep-2017]	[20-Sep-2017]	[20-Sep-2017]	[20-Sep-2017]	[20-Sep-2017]	
Compound	CAS Number	LOR	Unit	EP1710405-006	EP1710405-007	EP1710405-008	EP1710405-009	EP1710405-010	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.03	<0.02	<0.02	0.03	0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.01	0.01	<0.01	0.02	0.02	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Client sample ID

				SW1710_200917	SW1711_200917	WQA06_200917	SW1705_200917	SW05_200917
Client sampling date / time				[20-Sep-2017]	[20-Sep-2017]	[20-Sep-2017]	[20-Sep-2017]	[20-Sep-2017]
Compound	CAS Number	LOR	Unit	EP1710405-006	EP1710405-007	EP1710405-008	EP1710405-009	EP1710405-010
				Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	0.48	0.07	<0.01	0.64	0.38
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.44	0.06	<0.01	0.59	0.34
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.48	0.07	<0.01	0.64	0.38
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	2	%	110	110	111	110	111
Toluene-D8	2037-26-5	2	%	99.7	100	99.5	102	99.5
4-Bromofluorobenzene	460-00-4	2	%	89.2	87.9	89.3	87.5	87.8
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	114	116	129	122	127



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW1713_200917	TBW822	----	----	----
Client sampling date / time					[20-Sep-2017]	[20-Sep-2017]	----	----	----
Compound	CAS Number	LOR	Unit		EP1710405-011	EP1710405-012	-----	-----	-----
					Result	Result	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		<2	<2	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		0.03	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.02	----	----	----	----

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW1713_200917	TBW822	----	----	----
Client sampling date / time					[20-Sep-2017]	[20-Sep-2017]	----	----	----
Compound	CAS Number	LOR	Unit		EP1710405-011	EP1710405-012	-----	-----	-----
				Result	Result		----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW1713_200917	TBW822	----	----	----
Client sampling date / time					[20-Sep-2017]	[20-Sep-2017]	----	----	----
Compound	CAS Number	LOR	Unit		EP1710405-011	EP1710405-012	-----	-----	-----
				Result	Result		----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		0.05	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		0.05	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		0.05	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%		113	111	----	----	----
Toluene-D8	2037-26-5	2	%		102	98.5	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		88.7	86.4	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		121	----	----	----	----



Surrogate Control Limits

Sub-Matrix: **WATER**

		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	61	141
Toluene-D8	2037-26-5	73	126
4-Bromofluorobenzene	460-00-4	60	125
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	130

QUALITY CONTROL REPORT

Work Order	: EP1710405	Page	: 1 of 9
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Perth
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: LEVEL 6 3 FORREST PLACE PERTH WA, AUSTRALIA 6849	Address	: 10 Hod Way Malaga WA Australia 6090
Telephone	: ----	Telephone	: +61-8-9209 7655
Project	: 60543717.1.3 Perth Airport Limited Site Investigation	Date Samples Received	: 20-Sep-2017
Order number	: 60543717.1.3	Date Analysis Commenced	: 26-Sep-2017
C-O-C number	: ----	Issue Date	: 29-Sep-2017
Sampler	: [REDACTED]		
Site	: ----		
Quote number	: EN/004/16		
No. of samples received	: 12		
No. of samples analysed	: 12		



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
[REDACTED]	Organic Chemist	Sydney Organics, Smithfield, NSW
[REDACTED]	Graduate Chemist	Perth Organics, Malaga, WA
[REDACTED]	Organic Chemist	Perth Organics, Malaga, WA



General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1135862)									
EP1710405-009	SW1705_200917	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1138482)									
EP1710405-001	SW1708_200917	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP1710405-011	SW1713_200917	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1135862)									
EP1710405-009	SW1705_200917	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1138482)									
EP1710405-001	SW1708_200917	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP1710405-011	SW1713_200917	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 1138482)									
EP1710405-001	SW1708_200917	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EP1710405-011	SW1713_200917	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 1138482) - continued									
EP1710405-011	SW1713_200917	EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1130595)									
EP1710405-001	SW1708_200917	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	2.25	2.54	12.4	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.07	0.09	15.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.10	0.12	22.4	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.96	1.06	9.79	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.06	0.07	29.4	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP1710405-011	SW1713_200917	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.03	0.00	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.03	0.03	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1130595)									
EP1710405-001	SW1708_200917	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.08	0.09	13.8	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.05	0.06	18.5	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.22	0.26	13.8	0% - 50%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.04	0.05	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP1710405-011	SW1713_200917	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3			0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4			0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9			0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231X: Perfluorononanoic acid (PFNA)	375-95-1			0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2			0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8			0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1			0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8			0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7			0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit		



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1130595)									
EP1710405-001	SW1708_200917	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP1710405-011	SW1713_200917	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1130595)									
EP1710405-001	SW1708_200917	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP1710405-011	SW1713_200917	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit

Page : 5 of 9
 Work Order : EP1710405
 Client : AECOM Australia Pty Ltd
 Project : 60543717.1.3 Perth Airport Limited Site Investigation



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1130595) - continued									
EP1710405-011	SW1713_200917	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 1130595)									
EP1710405-001	SW1708_200917	EP231X: Sum of PFAS	----	0.01	µg/L	3.83	4.34	12.5	0% - 20%
EP1710405-011	SW1713_200917	EP231X: Sum of PFAS	----	0.01	µg/L	0.05	0.06	18.2	No Limit



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

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1130232)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	385 µg/L	69.4	35	95
EP071: C15 - C28 Fraction	----	100	µg/L	<100	385 µg/L	81.5	34	111
EP071: C29 - C36 Fraction	----	50	µg/L	<50	398 µg/L	64.1	34	105
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1135862)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	63.7	35	95
EP071: C15 - C28 Fraction	----	100	µg/L	<100	400 µg/L	62.6	34	111
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	64.4	34	105
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1138482)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	320 µg/L	99.2	74	113
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1130232)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	380 µg/L	73.3	37	99
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	597 µg/L	74.4	35	108
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	168 µg/L	51.7	11	117
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1135862)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	400 µg/L	64.7	37	99
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	600 µg/L	63.1	35	108
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	200 µg/L	62.2	11	117
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1138482)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	370 µg/L	104	74	115
EP080: BTEXN (QCLot: 1138482)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	96.3	84	114
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	107	81	115
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	96.6	84	113
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	40 µg/L	97.2	84	114
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	95.0	87	111
EP080: Naphthalene	91-20-3	5	µg/L	<5	20 µg/L	101	77	118
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1130595)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.5 µg/L	104	70	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.5 µg/L	117	70	130
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.5 µg/L	122	70	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.5 µg/L	117	70	130
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.5 µg/L	120	70	130



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1130595) - continued								
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.5 µg/L	107	70	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1130595)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	2.5 µg/L	103	70	130
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.5 µg/L	108	70	130
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.5 µg/L	123	70	130
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.5 µg/L	122	70	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.5 µg/L	121	70	130
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.5 µg/L	120	70	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.5 µg/L	117	70	130
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.5 µg/L	118	70	130
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.5 µg/L	116	70	130
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.5 µg/L	114	70	130
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	1.25 µg/L	118	70	150
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1130595)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.5 µg/L	110	70	130
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	1.25 µg/L	120	70	150
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	1.25 µg/L	118	70	150
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	1.25 µg/L	111	70	150
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	1.25 µg/L	115	70	150
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.5 µg/L	122	70	130
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.5 µg/L	107	70	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1130595)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.5 µg/L	113	70	130
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.5 µg/L	124	70	130
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.5 µg/L	122	70	130
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.5 µg/L	119	70	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: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1135862)							
EP1710405-009	SW1705_200917	EP071: C10 - C14 Fraction	----	400 µg/L	52.9	45	122
		EP071: C15 - C28 Fraction	----	400 µg/L	59.0	55	143
		EP071: C29 - C36 Fraction	----	400 µg/L	56.8	54	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1138482)							
EP1710405-002	SW1709_200917	EP080: C6 - C9 Fraction	----	240 µg/L	107	77	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1135862)							
EP1710405-009	SW1705_200917	EP071: >C10 - C16 Fraction	----	400 µg/L	54.7	45	122
		EP071: >C16 - C34 Fraction	----	600 µg/L	58.3	55	143
		EP071: >C34 - C40 Fraction	----	200 µg/L	55.1	54	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1138482)							
EP1710405-002	SW1709_200917	EP080: C6 - C10 Fraction	C6_C10	290 µg/L	107	77	137
EP080: BTEXN (QCLot: 1138482)							
EP1710405-002	SW1709_200917	EP080: Benzene	71-43-2	20 µg/L	99.1	77	122
		EP080: Toluene	108-88-3	20 µg/L	105	74	126
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1130595)							
EP1710405-001	SW1708_200917	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.5 µg/L	99.6	50	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.5 µg/L	115	50	130
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.5 µg/L	77.8	50	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.5 µg/L	116	50	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.5 µg/L	# Not Determined	50	130
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.5 µg/L	102	50	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1130595)							
EP1710405-001	SW1708_200917	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	2.5 µg/L	111	50	130
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.5 µg/L	120	50	130
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.5 µg/L	117	50	130
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.5 µg/L	113	50	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.5 µg/L	106	50	130
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.5 µg/L	113	50	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.5 µg/L	108	50	130
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.5 µg/L	108	50	130
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.5 µg/L	110	50	130
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.5 µg/L	94.8	50	130
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	1.25 µg/L	109	50	150
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1130595)							
EP1710405-001	SW1708_200917	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.5 µg/L	105	50	130



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1130595) - continued							
EP1710405-001	SW1708_200917	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	1.25 µg/L	101	50	150
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	1.25 µg/L	96.6	50	150
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	1.25 µg/L	99.8	50	150
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	1.25 µg/L	97.8	50	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.5 µg/L	107	50	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.5 µg/L	85.0	50	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1130595)							
EP1710405-001	SW1708_200917	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.5 µg/L	113	50	130
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.5 µg/L	117	50	130
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.5 µg/L	117	50	130
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.5 µg/L	110	50	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EP1710405	Page	: 1 of 6
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Perth
Contact	: [REDACTED]	Telephone	: +61-8-9209 7655
Project	: 60543717.1.3 Perth Airport Limited Site Investigation	Date Samples Received	: 20-Sep-2017
Site	: ----	Issue Date	: 29-Sep-2017
Sampler	: [REDACTED]	No. of samples received	: 12
Order number	: 60543717.1.3	No. of samples analysed	: 12

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EP1710405--001	SW1708_200917	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
TRH - Semivolatile Fraction	1	28	3.57	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
TRH - Semivolatile Fraction	1	28	3.57	5.00	NEPM 2013 B3 & ALS QC Standard

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved (EP071) SW1708_200917, SW1714_200917,	SW1709_200917, SW1702_200917	20-Sep-2017	26-Sep-2017	27-Sep-2017	✓	26-Sep-2017	05-Nov-2017	✓
Amber Glass Bottle - Unpreserved (EP071) WQA03_200917, SW1711_200917, SW1705_200917, SW1713_200917	SW1710_200917, WQA06_200917, SW05_200917,	20-Sep-2017	26-Sep-2017	27-Sep-2017	✓	27-Sep-2017	05-Nov-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080) SW1708_200917, SW1714_200917, WQA03_200917, SW1711_200917, SW1705_200917, SW1713_200917,	SW1709_200917, SW1702_200917, SW1710_200917, WQA06_200917, SW05_200917, TBW822	20-Sep-2017	27-Sep-2017	04-Oct-2017	✓	27-Sep-2017	04-Oct-2017	✓



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Amber Glass Bottle - Unpreserved (EP071) SW1708_200917, SW1714_200917,	SW1709_200917, SW1702_200917	20-Sep-2017	26-Sep-2017	27-Sep-2017	✓	26-Sep-2017	05-Nov-2017	✓
Amber Glass Bottle - Unpreserved (EP071) WQA03_200917, SW1711_200917, SW1705_200917, SW1713_200917	SW1710_200917, WQA06_200917, SW05_200917,	20-Sep-2017	26-Sep-2017	27-Sep-2017	✓	27-Sep-2017	05-Nov-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080) SW1708_200917, SW1714_200917, WQA03_200917, SW1711_200917, SW1705_200917, SW1713_200917,	SW1709_200917, SW1702_200917, SW1710_200917, WQA06_200917, SW05_200917, TBW822	20-Sep-2017	27-Sep-2017	04-Oct-2017	✓	27-Sep-2017	04-Oct-2017	✓
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080) SW1708_200917, SW1714_200917, WQA03_200917, SW1711_200917, SW1705_200917, SW1713_200917,	SW1709_200917, SW1702_200917, SW1710_200917, WQA06_200917, SW05_200917, TBW822	20-Sep-2017	27-Sep-2017	04-Oct-2017	✓	27-Sep-2017	04-Oct-2017	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X) SW1708_200917, SW1714_200917, WQA03_200917, SW1711_200917, SW1705_200917, SW1713_200917	SW1709_200917, SW1702_200917, SW1710_200917, WQA06_200917, SW05_200917,	20-Sep-2017	----	----	----	26-Sep-2017	19-Mar-2018	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X) SW1708_200917, SW1714_200917, WQA03_200917, SW1711_200917, SW1705_200917, SW1713_200917	SW1709_200917, SW1702_200917, SW1710_200917, WQA06_200917, SW05_200917,	20-Sep-2017	----	----	----	26-Sep-2017	19-Mar-2018	✓



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)		20-Sep-2017	----	----	----	26-Sep-2017	19-Mar-2018	✓
SW1708_200917,	SW1709_200917,							
SW1714_200917,	SW1702_200917,							
WQA03_200917,	SW1710_200917,							
SW1711_200917,	WQA06_200917,							
SW1705_200917,	SW05_200917,							
SW1713_200917								
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)		20-Sep-2017	----	----	----	26-Sep-2017	19-Mar-2018	✓
SW1708_200917,	SW1709_200917,							
SW1714_200917,	SW1702_200917,							
WQA03_200917,	SW1710_200917,							
SW1711_200917,	WQA06_200917,							
SW1705_200917,	SW05_200917,							
SW1713_200917								
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)		20-Sep-2017	----	----	----	26-Sep-2017	19-Mar-2018	✓
SW1708_200917,	SW1709_200917,							
SW1714_200917,	SW1702_200917,							
WQA03_200917,	SW1710_200917,							
SW1711_200917,	WQA06_200917,							
SW1705_200917,	SW05_200917,							
SW1713_200917								



Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Regular	Actual	Expected		Evaluation
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	28	3.57	10.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	28	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	28	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	28	3.57	5.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	14	7.14	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
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In house: Direct injection analysis of fresh waters after dilution (1:1) with methanol. Analysis by LC-Electrospray-MS-MS, Negative Mode using MRM. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.
Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP1710405**

Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Perth
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: LEVEL 6 3 FORREST PLACE PERTH WA, AUSTRALIA 6849	Address	: 10 Hod Way Malaga WA Australia 6090
E-mail	: [REDACTED]	E-mail	: [REDACTED]
Telephone	: ----	Telephone	: +61-8-9209 7655
Facsimile	: ----	Facsimile	: +61-8-9209 7600
Project	: 60543717.1.3 Perth Airport Limited Site Investigation	Page	: 1 of 3
Order number	: 60543717.1.3	Quote number	: EB2015AECOMAU0580 (EN/004/16)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: [REDACTED]		

Dates

Date Samples Received	: 20-Sep-2017 17:10	Issue Date	: 21-Sep-2017
Client Requested Due Date	: 29-Sep-2017	Scheduled Reporting Date	: 29-Sep-2017

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 13.2 - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 12 / 12

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (SamplesPerth@alsenviro.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**



Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

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

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

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - W-04 TRH/BTEXN	WATER - W-18 TRH(C6 - C9)/BTEXN
EP1710405-001	[20-Sep-2017]	SW1708_200917	✓	✓	
EP1710405-002	[20-Sep-2017]	SW1709_200917	✓	✓	
EP1710405-003	[20-Sep-2017]	SW1714_200917	✓	✓	
EP1710405-004	[20-Sep-2017]	SW1702_200917	✓	✓	
EP1710405-005	[20-Sep-2017]	WQA03_200917	✓	✓	
EP1710405-006	[20-Sep-2017]	SW1710_200917	✓	✓	
EP1710405-007	[20-Sep-2017]	SW1711_200917	✓	✓	
EP1710405-008	[20-Sep-2017]	WQA06_200917	✓	✓	
EP1710405-009	[20-Sep-2017]	SW1705_200917	✓	✓	
EP1710405-010	[20-Sep-2017]	SW05_200917	✓	✓	
EP1710405-011	[20-Sep-2017]	SW1713_200917	✓	✓	
EP1710405-012	[20-Sep-2017]	TBW822			✓

Proactive Holding Time Report

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



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email

[REDACTED]

- Chain of Custody (CoC) (COC)

Email

[REDACTED]

[REDACTED]

- *AU Certificate of Analysis - NATA (COA)

Email

[REDACTED]

- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)

Email

[REDACTED]

- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)

Email

[REDACTED]

- A4 - AU Sample Receipt Notification - Environmental HT (SRN)

Email

[REDACTED]

- A4 - AU Tax Invoice (INV)

Email

[REDACTED]

- Chain of Custody (CoC) (COC)

Email

[REDACTED]

- EDI Format - ENMRG (ENMRG)

Email

[REDACTED]

- EDI Format - EQUIS V5 URS (EQUIS_V5_AECOM)

Email

[REDACTED]

- EDI Format - ESDAT (ESDAT)

Email

[REDACTED]

- EDI Format - XTab (XTAB)

Email

[REDACTED]

- Electronic SRN for EQUIS (ESRN_EQUIS)

Email

[REDACTED]

[REDACTED]

- *AU Certificate of Analysis - NATA (COA)

Email

[REDACTED]

- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)

Email

[REDACTED]

- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)

Email

[REDACTED]

- A4 - AU Sample Receipt Notification - Environmental HT (SRN)

Email

[REDACTED]

- Chain of Custody (CoC) (COC)

Email

[REDACTED]

- EDI Format - ENMRG (ENMRG)

Email

[REDACTED]

- EDI Format - EQUIS V5 URS (EQUIS_V5_AECOM)

Email

[REDACTED]

- EDI Format - ESDAT (ESDAT)

Email

[REDACTED]

- EDI Format - XTab (XTAB)

Email

[REDACTED]

- Electronic SRN for EQUIS (ESRN_EQUIS)

Email

[REDACTED]

□ SYDNEY 277-289 Woodpark Road Smithfield NSW 2164
 Ph. 02 8784 8555 E: samples.sydney@alsglobal.com
 □ TOWNSVILLE 14-15 Desma Court Bohle QLD 4818
 Ph. 07 4796 0600 E: townsville.environmental@alsglobal.com

WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembla@alsglobal.com

[illegible]

ic Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CERTIFICATE OF ANALYSIS

Work Order : **EP1710473**
Client : **AECOM SERVICES PTY LTD**
Contact : [REDACTED]
Address : Supplier ID number - 1179447 LEVEL 6 3 FORREST PLACE
 PERTH WA, AUSTRALIA 6000
Telephone : +61 08 9326 0100
Project : 60543717.1.3 Perth Airport Limited Site Investigation
Order number : 60543717.1.3
C-O-C number : ----
Sampler : [REDACTED]
Site : ----
Quote number : EN/004/16
No. of samples received : 11
No. of samples analysed : 11

Page : 1 of 12
Laboratory : Environmental Division Perth
Contact : [REDACTED]
Address : 10 Hod Way Malaga WA Australia 6090
Telephone : 08 9209 7655
Date Samples Received : 21-Sep-2017 17:25
Date Analysis Commenced : 26-Sep-2017
Issue Date : 02-Oct-2017 15:07



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
[REDACTED]	Organic Chemist	Sydney Organics, Smithfield, NSW
[REDACTED]	SENIOR LAB TECH	Perth Organics, Malaga, WA
[REDACTED]	Graduate Chemist	Perth Organics, Malaga, WA
[REDACTED]	Organic Chemist	Perth Organics, Malaga, WA



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

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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW1715_210917	SW1701_210917	SW1712_210917	MW0172_210917	SW1707_210917
Client sampling date / time					21-Sep-2017 00:00	21-Sep-2017 00:00	21-Sep-2017 00:00	21-Sep-2017 00:00	21-Sep-2017 00:00
Compound	CAS Number	LOR	Unit		EP1710473-001	EP1710473-002	EP1710473-003	EP1710473-004	EP1710473-005
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		220	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		750	<100	140	<100	110
C29 - C36 Fraction	----	50	µg/L		200	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		1170	<50	140	<50	110
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L		390	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		690	<100	140	<100	120
>C34 - C40 Fraction	----	100	µg/L		110	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		1190	<100	140	<100	120
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		390	<100	<100	<100	<100
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	0.17	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	0.20	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		<0.02	<0.02	<0.02	3.53	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	0.07	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	1.50	0.01

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW1715_210917	SW1701_210917	SW1712_210917	MW0172_210917	SW1707_210917
Client sampling date / time				21-Sep-2017 00:00	21-Sep-2017 00:00	21-Sep-2017 00:00	21-Sep-2017 00:00	21-Sep-2017 00:00	
Compound	CAS Number	LOR	Unit	EP1710473-001	EP1710473-002	EP1710473-003	EP1710473-004	EP1710473-005	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	0.52	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	0.06	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	0.06	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW1715_210917	SW1701_210917	SW1712_210917	MW0172_210917	SW1707_210917
Client sampling date / time					21-Sep-2017 00:00	21-Sep-2017 00:00	21-Sep-2017 00:00	21-Sep-2017 00:00	21-Sep-2017 00:00
Compound	CAS Number	LOR	Unit		EP1710473-001	EP1710473-002	EP1710473-003	EP1710473-004	EP1710473-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	6.11	0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	5.03	0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	5.84	0.01
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%		93.1	92.8	100	109	101
Toluene-D8	2037-26-5	2	%		102	102	99.6	97.4	101
4-Bromofluorobenzene	460-00-4	2	%		101	101	80.9	83.7	80.5
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		98.5	94.7	98.9	104	106



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				MW0146_210917	SW1703_210917	SW1704_210917	WQA06_210917 TBW821	WQA07_210917
Client sampling date / time				21-Sep-2017 00:00	21-Sep-2017 00:00	21-Sep-2017 00:00	21-Sep-2017 00:00	21-Sep-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710473-006	EP1710473-007	EP1710473-008	EP1710473-009	EP1710473-010
				Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	----	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	----	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	----	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	----	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	----	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	100	----	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	----	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	100	----	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	<100	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	----	<100	----	----	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.03	0.04	0.03	----	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	----	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.10	0.22	----	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	----	<0.02



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				MW0146_210917	SW1703_210917	SW1704_210917	WQA06_210917 TBW821	WQA07_210917
Client sampling date / time				21-Sep-2017 00:00	21-Sep-2017 00:00	21-Sep-2017 00:00	21-Sep-2017 00:00	21-Sep-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710473-006	EP1710473-007	EP1710473-008	EP1710473-009	EP1710473-010
				Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.04	0.14	----	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	----	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	----	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	----	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.02	0.04	----	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	----	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	----	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	----	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	----	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	----	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	----	<0.02
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	----	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	----	<0.05
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	----	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	----	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	----	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	----	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	----	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	----	<0.02



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				MW0146_210917	SW1703_210917	SW1704_210917	WQA06_210917 TBW821	WQA07_210917
Client sampling date / time				21-Sep-2017 00:00	21-Sep-2017 00:00	21-Sep-2017 00:00	21-Sep-2017 00:00	21-Sep-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710473-006	EP1710473-007	EP1710473-008	EP1710473-009	EP1710473-010
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	----	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	----	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	----	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	----	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	----	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	0.03	0.20	0.43	----	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	0.14	0.36	----	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.03	0.20	0.43	----	<0.01
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	2	%	103	110	105	104	98.9
Toluene-D8	2037-26-5	2	%	99.9	99.6	99.5	100	104
4-Bromofluorobenzene	460-00-4	2	%	79.0	80.6	79.5	78.0	78.9
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	98.4	97.7	99.8	----	96.0



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	WQA08_210917	----	----	----	----
Client sampling date / time				21-Sep-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EP1710473-011	-----	-----	-----	-----
Result				----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	----	----	----	----

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQA08_210917	----	----	----	----
Client sampling date / time				21-Sep-2017 00:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	EP1710473-011	-----	-----	-----	-----	
				Result	----	----	----	----	
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	----	----	----	----	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	----	----	----	----	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	----	----	----	----	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	----	----	----	----	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	----	----	----	----	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	----	----	----	----	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	----	----	----	----	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	----	----	----	----	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	----	----	----	----	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	----	----	----	----	
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	----	----	----	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	----	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	----	----	----	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	----	----	----	----	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	----	----	----	----	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	----	----	----	----	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	----	----	----	----	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	----	----	----	----	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	----	----	----	----	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQA08_210917	----	----	----	----
Client sampling date / time					21-Sep-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EP1710473-011	-----	-----	-----	-----
				Result		----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%		92.9	----	----	----	----
Toluene-D8	2037-26-5	2	%		104	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		99.5	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		96.1	----	----	----	----



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	61	141
Toluene-D8	2037-26-5	73	126
4-Bromofluorobenzene	460-00-4	60	125
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	130

QUALITY CONTROL REPORT

Work Order	: EP1710473	Page	: 1 of 9
Client	: AECOM SERVICES PTY LTD	Laboratory	: Environmental Division Perth
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: Supplier ID number - 1179447 LEVEL 6 3 FORREST PLACE PERTH WA, AUSTRALIA 6000	Address	: 10 Hod Way Malaga WA Australia 6090
Telephone	: +61 08 9326 0100	Telephone	: 08 9209 7655
Project	: 60543717.1.3 Perth Airport Limited Site Investigation	Date Samples Received	: 21-Sep-2017
Order number	: 60543717.1.3	Date Analysis Commenced	: 26-Sep-2017
C-O-C number	: ----	Issue Date	: 02-Oct-2017
Sampler	: [REDACTED]		
Site	: ----		
Quote number	: EN/004/16		
No. of samples received	: 11		
No. of samples analysed	: 11		



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
[REDACTED]	Organic Chemist	Sydney Organics, Smithfield, NSW
[REDACTED]	SENIOR LAB TECH	Perth Organics, Malaga, WA
[REDACTED]	Graduate Chemist	Perth Organics, Malaga, WA
[REDACTED]	Organic Chemist	Perth Organics, Malaga, WA



General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1135845)									
EP1710473-008	SW1704_210917	EP071: C15 - C28 Fraction	----	100	µg/L	<100	160	46.5	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EP1710516-006	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	460	520	12.3	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	150	180	22.8	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1138449)									
EP1710473-001	SW1715_210917	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP1710473-011	WQA08_210917	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1135845)									
EP1710473-008	SW1704_210917	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	100	160	45.4	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP1710516-006	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	220	280	22.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	370	410	11.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1138449)									
EP1710473-001	SW1715_210917	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP1710473-011	WQA08_210917	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 1138449)									
EP1710473-001	SW1715_210917	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 1138449) - continued									
EP1710473-001	SW1715_210917	EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
EP1710473-011	WQA08_210917	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit	
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1133735)									
EP1710473-001	SW1715_210917	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
ES1723982-061	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1133735)									
EP1710473-001	SW1715_210917	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
ES1723982-061	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1133735) - continued									
ES1723982-061	Anonymous	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1133735)									
EP1710473-001	SW1715_210917	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ES1723982-061	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1133735)									
EP1710473-001	SW1715_210917	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit

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 Work Order : EP1710473
 Client : AECOM SERVICES PTY LTD
 Project : 60543717.1.3 Perth Airport Limited Site Investigation



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1133735) - continued									
EP1710473-001	SW1715_210917	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ES1723982-061	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 1133735)									
EP1710473-001	SW1715_210917	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.00	No Limit
ES1723982-061	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.00	No Limit



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

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1135845)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	385 µg/L	67.3	35	95
EP071: C15 - C28 Fraction	----	100	µg/L	<100	385 µg/L	74.4	34	111
EP071: C29 - C36 Fraction	----	50	µg/L	<50	398 µg/L	58.0	34	105
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1138449)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	320 µg/L	102	74	113
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1135845)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	380 µg/L	69.4	37	99
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	597 µg/L	67.9	35	108
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	168 µg/L	43.9	11	117
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1138449)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	370 µg/L	103	74	115
EP080: BTEXN (QCLot: 1138449)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	107	84	114
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	102	81	115
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	104	84	113
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	40 µg/L	104	84	114
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	103	87	111
EP080: Naphthalene	91-20-3	5	µg/L	<5	20 µg/L	99.8	77	118
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1133735)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.5 µg/L	85.4	70	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.5 µg/L	101	70	130
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.5 µg/L	110	70	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.5 µg/L	98.6	70	130
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.5 µg/L	77.0	70	130
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.5 µg/L	93.2	70	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1133735)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	2.5 µg/L	110	70	130
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.5 µg/L	99.2	70	130
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.5 µg/L	108	70	130
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.5 µg/L	112	70	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.5 µg/L	72.2	70	130
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.5 µg/L	99.0	70	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.5 µg/L	79.8	70	130



Sub-Matrix: **WATER**

Method: Compound				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
						LCS	Low	High
CAS Number	LOR	Unit	Result					
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1133735) - continued								
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.5 µg/L	76.2	70	130
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.5 µg/L	95.2	70	130
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.5 µg/L	80.4	70	130
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	1.25 µg/L	102	70	150
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1133735)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.5 µg/L	78.8	70	130
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	1.25 µg/L	111	70	150
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	1.25 µg/L	74.6	70	150
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	1.25 µg/L	73.8	70	150
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	1.25 µg/L	84.6	70	150
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.5 µg/L	99.2	70	130
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.5 µg/L	100	70	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1133735)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.5 µg/L	85.2	70	130
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.5 µg/L	97.2	70	130
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.5 µg/L	117	70	130
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.5 µg/L	95.4	70	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: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1135845)							
EP1710473-008	SW1704_210917	EP071: C10 - C14 Fraction	----	385 µg/L	77.1	45	122
		EP071: C15 - C28 Fraction	----	385 µg/L	88.6	55	143
		EP071: C29 - C36 Fraction	----	398 µg/L	60.1	54	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1138449)							
EP1710473-002	SW1701_210917	EP080: C6 - C9 Fraction	----	240 µg/L	77.6	77	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1135845)							
EP1710473-008	SW1704_210917	EP071: >C10 - C16 Fraction	----	380 µg/L	82.3	45	122
		EP071: >C16 - C34 Fraction	----	597 µg/L	74.4	55	143



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1135845) - continued							
EP1710473-008	SW1704_210917	EP071: >C34 - C40 Fraction	----	168 µg/L	56.4	54	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1138449)							
EP1710473-002	SW1701_210917	EP080: C6 - C10 Fraction	C6_C10	290 µg/L	77.6	77	137
EP080: BTEXN (QCLot: 1138449)							
EP1710473-002	SW1701_210917	EP080: Benzene	71-43-2	20 µg/L	79.8	77	122
		EP080: Toluene	108-88-3	20 µg/L	76.2	74	126
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1133735)							
EP1710473-001	SW1715_210917	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.5 µg/L	105	50	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.5 µg/L	115	50	130
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.5 µg/L	110	50	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.5 µg/L	119	50	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.5 µg/L	88.6	50	130
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.5 µg/L	86.4	50	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1133735)							
EP1710473-001	SW1715_210917	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	2.5 µg/L	112	50	130
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.5 µg/L	108	50	130
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.5 µg/L	124	50	130
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.5 µg/L	127	50	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.5 µg/L	82.2	50	130
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.5 µg/L	112	50	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.5 µg/L	89.0	50	130
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.5 µg/L	84.2	50	130
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.5 µg/L	110	50	130
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.5 µg/L	103	50	130
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	1.25 µg/L	102	50	150
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1133735)							
EP1710473-001	SW1715_210917	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.5 µg/L	66.0	50	130
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	1.25 µg/L	126	50	150
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	1.25 µg/L	87.8	50	150
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	1.25 µg/L	72.0	50	150
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	1.25 µg/L	97.3	50	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.5 µg/L	114	50	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.5 µg/L	105	50	130



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1133735)							
EP1710473-001	SW1715_210917	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.5 µg/L	99.4	50	130
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.5 µg/L	107	50	130
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.5 µg/L	120	50	130
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.5 µg/L	108	50	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EP1710473	Page	: 1 of 6
Client	: AECOM SERVICES PTY LTD	Laboratory	: Environmental Division Perth
Contact	: [REDACTED]	Telephone	: 08 9209 7655
Project	: 60543717.1.3 Perth Airport Limited Site Investigation	Date Samples Received	: 21-Sep-2017
Site	: ----	Issue Date	: 02-Oct-2017
Sampler	: [REDACTED]	No. of samples received	: 11
Order number	: 60543717.1.3	No. of samples analysed	: 11

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **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: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved (EP071) SW1715_210917, SW1712_210917, SW1707_210917, SW1703_210917, WQA07_210917, SW1701_210917, MW0172_210917, MW0146_210917, SW1704_210917, WQA08_210917	21-Sep-2017	28-Sep-2017	28-Sep-2017	✓	28-Sep-2017	07-Nov-2017	✓	
Amber VOC Vial - Sulfuric Acid (EP080) SW1715_210917, SW1712_210917, SW1707_210917, SW1703_210917, WQA06_210917 - TBW821, WQA08_210917 SW1701_210917, MW0172_210917, MW0146_210917, SW1704_210917, WQA07_210917	21-Sep-2017	28-Sep-2017	05-Oct-2017	✓	28-Sep-2017	05-Oct-2017	✓	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Amber Glass Bottle - Unpreserved (EP071) SW1715_210917, SW1712_210917, SW1707_210917, SW1703_210917, WQA07_210917, SW1701_210917, MW0172_210917, MW0146_210917, SW1704_210917, WQA08_210917	21-Sep-2017	28-Sep-2017	28-Sep-2017	✓	28-Sep-2017	07-Nov-2017	✓	
Amber VOC Vial - Sulfuric Acid (EP080) SW1715_210917, SW1712_210917, SW1707_210917, SW1703_210917, WQA06_210917 - TBW821, WQA08_210917 SW1701_210917, MW0172_210917, MW0146_210917, SW1704_210917, WQA07_210917	21-Sep-2017	28-Sep-2017	05-Oct-2017	✓	28-Sep-2017	05-Oct-2017	✓	



Matrix: **WATER**

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080)		21-Sep-2017	28-Sep-2017	05-Oct-2017	✓	28-Sep-2017	05-Oct-2017	✓
SW1715_210917,	SW1701_210917,							
SW1712_210917,	MW0172_210917,							
SW1707_210917,	MW0146_210917,							
SW1703_210917,	SW1704_210917,							
WQA06_210917 - TBW821,	WQA07_210917,							
WQA08_210917								
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)		21-Sep-2017	----	----	----	26-Sep-2017	20-Mar-2018	✓
SW1715_210917,	SW1701_210917,							
SW1712_210917,	MW0172_210917,							
SW1707_210917,	MW0146_210917,							
SW1703_210917,	SW1704_210917,							
WQA07_210917,	WQA08_210917							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)		21-Sep-2017	----	----	----	26-Sep-2017	20-Mar-2018	✓
SW1715_210917,	SW1701_210917,							
SW1712_210917,	MW0172_210917,							
SW1707_210917,	MW0146_210917,							
SW1703_210917,	SW1704_210917,							
WQA07_210917,	WQA08_210917							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)		21-Sep-2017	----	----	----	26-Sep-2017	20-Mar-2018	✓
SW1715_210917,	SW1701_210917,							
SW1712_210917,	MW0172_210917,							
SW1707_210917,	MW0146_210917,							
SW1703_210917,	SW1704_210917,							
WQA07_210917,	WQA08_210917							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)		21-Sep-2017	----	----	----	26-Sep-2017	20-Mar-2018	✓
SW1715_210917,	SW1701_210917,							
SW1712_210917,	MW0172_210917,							
SW1707_210917,	MW0146_210917,							
SW1703_210917,	SW1704_210917,							
WQA07_210917,	WQA08_210917							

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
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
SW1715_210917,	SW1701_210917,	21-Sep-2017	----	----	----	26-Sep-2017	20-Mar-2018
SW1712_210917,	MW0172_210917,						✓
SW1707_210917,	MW0146_210917,						
SW1703_210917,	SW1704_210917,						
WQA07_210917,	WQA08_210917						



Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Regular	Actual	Expected		Evaluation
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In house: Direct injection analysis of fresh waters after dilution (1:1) with methanol. Analysis by LC-Electrospray-MS-MS, Negative Mode using MRM. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.
Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP1710473**

Client : AECOM SERVICES PTY LTD
Contact : [REDACTED]
Address : Supplier ID number - 1179447 LEVEL
6 3 FORREST PLACE
PERTH WA, AUSTRALIA 6000

Laboratory : Environmental Division Perth
Contact : [REDACTED]
Address : 10 Hod Way Malaga WA Australia 6090

E-mail : [REDACTED]
Telephone : +61 08 9326 0100
Facsimile : +61 08 8925 5555

E-mail : [REDACTED]
Telephone : 08 9209 7655
Facsimile : +61-8-9209 7600

Project : 60543717.1.3 Perth Airport Limited
Site Investigation

Page : 1 of 3

Order number : 60543717.1.3

Quote number : EP2017URSWA0001 (EN/004/16)

C-O-C number : ----

QC Level : NEPM 2013 B3 & ALS QC Standard

Site : ----

Sampler : [REDACTED]

Dates

Date Samples Received : 21-Sep-2017 17:25
Client Requested Due Date : 02-Oct-2017

Issue Date : 22-Sep-2017
Scheduled Reporting Date : **02-Oct-2017**

Delivery Details

Mode of Delivery : Carrier
No. of coolers/boxes : 1
Receipt Detail :

Security Seal : Not Available
Temperature : 1.1 - Ice Bricks present
No. of samples received / analysed : 11 / 11

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (SamplesPerth@alsenviro.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**



Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

Any sample identifications that cannot be displayed entirely in the analysis summary table will be listed below.

EP1710473-009 : [21-Sep-2017] : WQA06_210917 - TBW821

Summary of Sample(s) and Requested Analysis

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

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

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - W-04 TRH/BTEXN	WATER - W-18 TRH(C6 - C9)/BTEXN
EP1710473-001	21-Sep-2017 00:00	SW1715_210917	✓	✓	
EP1710473-002	21-Sep-2017 00:00	SW1701_210917	✓	✓	
EP1710473-003	21-Sep-2017 00:00	SW1712_210917	✓	✓	
EP1710473-004	21-Sep-2017 00:00	MW0172_210917	✓	✓	
EP1710473-005	21-Sep-2017 00:00	SW1707_210917	✓	✓	
EP1710473-006	21-Sep-2017 00:00	MW0146_210917	✓	✓	
EP1710473-007	21-Sep-2017 00:00	SW1703_210917	✓	✓	
EP1710473-008	21-Sep-2017 00:00	SW1704_210917	✓	✓	
EP1710473-009	21-Sep-2017 00:00	WQA06_210917 TBW821			✓
EP1710473-010	21-Sep-2017 00:00	WQA07_210917	✓	✓	
EP1710473-011	21-Sep-2017 00:00	WQA08_210917	✓	✓	

Proactive Holding Time Report

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



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email AP_CustomerService.anz@aecom.com

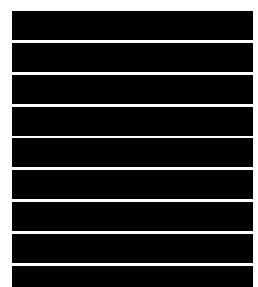
- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)
- EDI Format - XTab (XTAB)

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- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)
- EDI Format - XTab (XTAB)

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□ SYDNEY 277-289 Woodpark Road Smithfield NSW 2164
 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
 □ TOWNSVILLE 14-15 Desma Court Bohle QLD 4818
 Ph: 07 4796 0600 E: townesville.environmental@alsglobal.com
 □ WOLLONGONG 89 Kenny Street Wollongong NSW 2500
 Ph: 02 4225 3125 E: portkembla@alsglobal.com

reserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; B = Bag for Acid Sulfate Soils; B = Unpreserved Bag.

CERTIFICATE OF ANALYSIS

Work Order : **EP1710913**
Client : **AECOM Australia Pty Ltd**
Contact : [REDACTED]
Address : LEVEL 6 3 FORREST PLACE
 PERTH WA, AUSTRALIA 6849
Telephone : ----
Project : Petroleum Projects
Order number : ----
C-O-C number : ----
Sampler : [REDACTED]
Site : ----
Quote number : EN/096/16
No. of samples received : 17
No. of samples analysed : 14

Page : 1 of 12
Laboratory : Environmental Division Perth
Contact : [REDACTED]
Address : 10 Hod Way Malaga WA Australia 6090
Telephone : 08 9209 7655
Date Samples Received : 03-Oct-2017 13:55
Date Analysis Commenced : 05-Oct-2017
Issue Date : 12-Oct-2017 13:45



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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
[REDACTED]	Metals Instrument Chemist	Perth Inorganics, Malaga, WA
[REDACTED]	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
[REDACTED]	Senior Organic Chemist	Sydney Organics, Smithfield, NSW
[REDACTED]	Graduate Chemist	Perth Organics, Malaga, WA
[REDACTED]	Organic Chemist	Perth Organics, Malaga, WA



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.

- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB1712_031017_0-0.1	SB1711_031017_0-0.1	SB1714_031017_0-0.1	SB1713_031017_0-0.1	SB17071_031017_0-0.1
Client sampling date / time				03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710913-001	EP1710913-002	EP1710913-003	EP1710913-004	EP1710913-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	3.2	5.2	4.6	2.4	2.8
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	130	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	130	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	----	<0.0002	0.0011	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	----	<0.0002	0.0008	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	----	0.0015	0.0085	0.0010	0.0005



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB1712_031017_0-0.1	SB1711_031017_0-0.1	SB1714_031017_0-0.1	SB1713_031017_0-0.1	SB17071_031017_0-0.1
Client sampling date / time				03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710913-001	EP1710913-002	EP1710913-003	EP1710913-004	EP1710913-005
				Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued								
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	----	<0.0002	0.0007	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	----	0.0197	0.0734	0.0148	0.0770
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	----	<0.0002	<0.0002	0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	----	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	----	<0.0002	0.0009	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	----	0.0003	0.0022	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	----	<0.0002	0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	----	0.0002	0.0015	0.0004	0.0003
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	----	<0.0002	<0.0002	<0.0002	0.0021
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	----	<0.0002	<0.0002	0.0017	0.0019
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	----	<0.0002	<0.0002	0.0007	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	----	<0.0002	<0.0002	0.0003	<0.0002
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	----	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	----	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	----	<0.0002	0.0009	0.0009	0.0007
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	----	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	----	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.0005	mg/kg	----	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	----	<0.0005	<0.0005	<0.0005	<0.0005



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB1712_031017_0-0.1	SB1711_031017_0-0.1	SB1714_031017_0-0.1	SB1713_031017_0-0.1	SB17071_031017_0-0.1
Client sampling date / time				03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710913-001	EP1710913-002	EP1710913-003	EP1710913-004	EP1710913-005
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	----	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	----	<0.0002	<0.0002	<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	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	----	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	----	<0.0005	<0.0005	0.0007	0.0015
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	----	<0.0005	<0.0005	0.0010	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	----	0.0217	0.0902	0.0217	0.0840
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	----	0.0212	0.0819	0.0158	0.0775
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	----	0.0217	0.0878	0.0169	0.0793
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	103	106	103	105	102
Toluene-D8	2037-26-5	0.2	%	79.3	81.8	81.1	83.3	80.7
4-Bromofluorobenzene	460-00-4	0.2	%	73.4	74.1	74.9	76.1	73.2
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	----	91.0	63.0	78.0	70.0



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SQA15_031017	SB1712_031017_0.1-0	SB1711_031017_0.1-0	SB1714_031017_0.1-0	SB1713_031017_0.1-0
				.5	.5	.5	.5	.5
Client sampling date / time				03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710913-006	EP1710913-007	EP1710913-008	EP1710913-009	EP1710913-010
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	3.1	3.8	6.1	3.4	4.0
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	----	<0.0002	0.0005	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	----	<0.0002	0.0004	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0012	----	0.0007	0.0054	0.0005



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SQA15_031017	SB1712_031017_0.1-0 .5	SB1711_031017_0.1-0 .5	SB1714_031017_0.1-0 .5	SB1713_031017_0.1-0 .5
Client sampling date / time				03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710913-006	EP1710913-007	EP1710913-008	EP1710913-009	EP1710913-010
				Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued								
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0002	----	<0.0002	0.0004	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.128	----	0.0325	0.0466	0.0546
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0031	----	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	----	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0005	----	0.0003	0.0009	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0008	----	0.0003	0.0015	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0003	----	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0007	----	<0.0002	0.0011	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	----	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0008	----	<0.0002	<0.0002	0.0004
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.0008	----	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	0.0009	----	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	----	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	----	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	0.0085	----	<0.0002	0.0010	0.0003
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	----	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.0005	mg/kg	<0.0005	----	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	----	<0.0005	<0.0005	<0.0005



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SQA15_031017	SB1712_031017_0.1-0 .5	SB1711_031017_0.1-0 .5	SB1714_031017_0.1-0 .5	SB1713_031017_0.1-0 .5
Client sampling date / time				03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710913-006	EP1710913-007	EP1710913-008	EP1710913-009	EP1710913-010
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	----	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	----	<0.0002	<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	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	----	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	0.0005	----	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	----	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	0.146	----	0.0338	0.0578	0.0558
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.129	----	0.0332	0.0520	0.0551
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.132	----	0.0338	0.0560	0.0551
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	79.6	86.5	80.6	82.3	79.6
Toluene-D8	2037-26-5	0.2	%	84.4	82.7	79.2	86.6	81.9
4-Bromofluorobenzene	460-00-4	0.2	%	83.2	81.6	79.8	81.0	76.2
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	85.0	----	80.0	76.0	76.0



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB17071_031017_0.1-0.5	TBS451	SB1712_031017_0.1-0.5 A	SB1712_031017_0.1-0.5 B	----
Client sampling date / time				03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00	----
Compound	CAS Number	LOR	Unit	EP1710913-011	EP1710913-015	EP1710913-016	EP1710913-017	-----
				Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	4.2	<1.0	4.1	3.4	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	----	<0.0002	<0.0002	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	----	<0.0002	<0.0002	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	----	0.0012	0.0010	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB17071_031017_0.1-0.5	TBS451	SB1712_031017_0.1-0.5 A	SB1712_031017_0.1-0.5 B	----
Client sampling date / time				03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00	----
Compound	CAS Number	LOR	Unit	EP1710913-011	EP1710913-015	EP1710913-016	EP1710913-017	-----
				Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids - Continued								
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0004	----	0.0005	0.0002	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.716	----	0.391	0.163	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	----	0.0015	0.0017	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	----	<0.001	<0.001	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	----	0.0005	<0.0002	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	----	0.0007	0.0004	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	----	0.0003	<0.0002	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0017	----	0.0009	0.0004	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0084	----	0.0004	0.0002	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	----	0.0005	0.0009	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	----	0.0003	0.0007	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	----	0.0004	0.0005	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	----	<0.0002	<0.0002	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	----	<0.0005	<0.0005	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	0.0002	----	0.0039	0.0064	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	----	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.0005	mg/kg	<0.0005	----	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	----	<0.0005	<0.0005	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB17071_031017_0.1-0.5	TBS451	SB1712_031017_0.1-0.5 A	SB1712_031017_0.1-0.5 B	----
Client sampling date / time				03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00	03-Oct-2017 00:00	----
Compound	CAS Number	LOR	Unit	EP1710913-011	EP1710913-015	EP1710913-016	EP1710913-017	-----
				Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	----	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	----	<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	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	----	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	----	<0.0005	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	----	<0.0005	<0.0005	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	0.727	----	0.402	0.175	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.716	----	0.392	0.164	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.718	----	0.395	0.165	----
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	77.5	97.4	----	----	----
Toluene-D8	2037-26-5	0.2	%	75.6	92.4	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	75.8	85.3	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	85.0	----	83.0	84.0	----



Surrogate Control Limits

Sub-Matrix: **SOIL**

		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	63	132
Toluene-D8	2037-26-5	66	125
4-Bromofluorobenzene	460-00-4	60	124
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	130

QUALITY CONTROL REPORT

Work Order	: EP1710473	Page	: 1 of 9
Client	: AECOM SERVICES PTY LTD	Laboratory	: Environmental Division Perth
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: Supplier ID number - 1179447 LEVEL 6 3 FORREST PLACE PERTH WA, AUSTRALIA 6000	Address	: 10 Hod Way Malaga WA Australia 6090
Telephone	: +61 08 9326 0100	Telephone	: 08 9209 7655
Project	: 60543717.1.3 Perth Airport Limited Site Investigation	Date Samples Received	: 21-Sep-2017
Order number	: 60543717.1.3	Date Analysis Commenced	: 26-Sep-2017
C-O-C number	: ----	Issue Date	: 02-Oct-2017
Sampler	: [REDACTED]		
Site	: ----		
Quote number	: EN/004/16		
No. of samples received	: 11		
No. of samples analysed	: 11		



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
[REDACTED]	Organic Chemist	Sydney Organics, Smithfield, NSW
[REDACTED]	SENIOR LAB TECH	Perth Organics, Malaga, WA
[REDACTED]	Graduate Chemist	Perth Organics, Malaga, WA
[REDACTED]	Organic Chemist	Perth Organics, Malaga, WA



General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1135845)									
EP1710473-008	SW1704_210917	EP071: C15 - C28 Fraction	----	100	µg/L	<100	160	46.5	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EP1710516-006	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	460	520	12.3	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	150	180	22.8	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1138449)									
EP1710473-001	SW1715_210917	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP1710473-011	WQA08_210917	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1135845)									
EP1710473-008	SW1704_210917	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	100	160	45.4	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP1710516-006	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	220	280	22.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	370	410	11.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1138449)									
EP1710473-001	SW1715_210917	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP1710473-011	WQA08_210917	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 1138449)									
EP1710473-001	SW1715_210917	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 1138449) - continued									
EP1710473-001	SW1715_210917	EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
EP1710473-011	WQA08_210917	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit	
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1133735)									
EP1710473-001	SW1715_210917	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
ES1723982-061	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1133735)									
EP1710473-001	SW1715_210917	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
ES1723982-061	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1133735) - continued									
ES1723982-061	Anonymous	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1133735)									
EP1710473-001	SW1715_210917	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ES1723982-061	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1133735)									
EP1710473-001	SW1715_210917	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit

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 Work Order : EP1710473
 Client : AECOM SERVICES PTY LTD
 Project : 60543717.1.3 Perth Airport Limited Site Investigation



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1133735) - continued									
EP1710473-001	SW1715_210917	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ES1723982-061	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 1133735)									
EP1710473-001	SW1715_210917	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.00	No Limit
ES1723982-061	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.00	No Limit



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

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1135845)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	385 µg/L	67.3	35	95
EP071: C15 - C28 Fraction	----	100	µg/L	<100	385 µg/L	74.4	34	111
EP071: C29 - C36 Fraction	----	50	µg/L	<50	398 µg/L	58.0	34	105
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1138449)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	320 µg/L	102	74	113
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1135845)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	380 µg/L	69.4	37	99
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	597 µg/L	67.9	35	108
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	168 µg/L	43.9	11	117
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1138449)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	370 µg/L	103	74	115
EP080: BTEXN (QCLot: 1138449)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	107	84	114
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	102	81	115
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	104	84	113
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	40 µg/L	104	84	114
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	103	87	111
EP080: Naphthalene	91-20-3	5	µg/L	<5	20 µg/L	99.8	77	118
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1133735)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.5 µg/L	85.4	70	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.5 µg/L	101	70	130
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.5 µg/L	110	70	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.5 µg/L	98.6	70	130
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.5 µg/L	77.0	70	130
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.5 µg/L	93.2	70	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1133735)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	2.5 µg/L	110	70	130
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.5 µg/L	99.2	70	130
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.5 µg/L	108	70	130
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.5 µg/L	112	70	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.5 µg/L	72.2	70	130
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.5 µg/L	99.0	70	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.5 µg/L	79.8	70	130



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1133735) - continued								
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.5 µg/L	76.2	70	130
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.5 µg/L	95.2	70	130
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.5 µg/L	80.4	70	130
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	1.25 µg/L	102	70	150
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1133735)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.5 µg/L	78.8	70	130
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	1.25 µg/L	111	70	150
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	1.25 µg/L	74.6	70	150
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	1.25 µg/L	73.8	70	150
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	1.25 µg/L	84.6	70	150
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.5 µg/L	99.2	70	130
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.5 µg/L	100	70	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1133735)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.5 µg/L	85.2	70	130
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.5 µg/L	97.2	70	130
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.5 µg/L	117	70	130
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.5 µg/L	95.4	70	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: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1135845)							
EP1710473-008	SW1704_210917	EP071: C10 - C14 Fraction	----	385 µg/L	77.1	45	122
		EP071: C15 - C28 Fraction	----	385 µg/L	88.6	55	143
		EP071: C29 - C36 Fraction	----	398 µg/L	60.1	54	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1138449)							
EP1710473-002	SW1701_210917	EP080: C6 - C9 Fraction	----	240 µg/L	77.6	77	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1135845)							
EP1710473-008	SW1704_210917	EP071: >C10 - C16 Fraction	----	380 µg/L	82.3	45	122
		EP071: >C16 - C34 Fraction	----	597 µg/L	74.4	55	143



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1135845) - continued							
EP1710473-008	SW1704_210917	EP071: >C34 - C40 Fraction	----	168 µg/L	56.4	54	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1138449)							
EP1710473-002	SW1701_210917	EP080: C6 - C10 Fraction	C6_C10	290 µg/L	77.6	77	137
EP080: BTEXN (QCLot: 1138449)							
EP1710473-002	SW1701_210917	EP080: Benzene	71-43-2	20 µg/L	79.8	77	122
		EP080: Toluene	108-88-3	20 µg/L	76.2	74	126
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1133735)							
EP1710473-001	SW1715_210917	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.5 µg/L	105	50	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.5 µg/L	115	50	130
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.5 µg/L	110	50	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.5 µg/L	119	50	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.5 µg/L	88.6	50	130
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.5 µg/L	86.4	50	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1133735)							
EP1710473-001	SW1715_210917	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	2.5 µg/L	112	50	130
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.5 µg/L	108	50	130
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.5 µg/L	124	50	130
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.5 µg/L	127	50	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.5 µg/L	82.2	50	130
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.5 µg/L	112	50	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.5 µg/L	89.0	50	130
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.5 µg/L	84.2	50	130
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.5 µg/L	110	50	130
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.5 µg/L	103	50	130
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	1.25 µg/L	102	50	150
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1133735)							
EP1710473-001	SW1715_210917	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.5 µg/L	66.0	50	130
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	1.25 µg/L	126	50	150
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	1.25 µg/L	87.8	50	150
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	1.25 µg/L	72.0	50	150
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	1.25 µg/L	97.3	50	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.5 µg/L	114	50	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.5 µg/L	105	50	130



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1133735)							
EP1710473-001	SW1715_210917	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.5 µg/L	99.4	50	130
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.5 µg/L	107	50	130
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.5 µg/L	120	50	130
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.5 µg/L	108	50	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EP1710473	Page	: 1 of 6
Client	: AECOM SERVICES PTY LTD	Laboratory	: Environmental Division Perth
Contact	: [REDACTED]	Telephone	: 08 9209 7655
Project	: 60543717.1.3 Perth Airport Limited Site Investigation	Date Samples Received	: 21-Sep-2017
Site	: ----	Issue Date	: 02-Oct-2017
Sampler	: [REDACTED]	No. of samples received	: 11
Order number	: 60543717.1.3	No. of samples analysed	: 11

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **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: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) SW1715_210917, SW1712_210917, SW1707_210917, SW1703_210917, WQA07_210917, SW1701_210917, MW0172_210917, MW0146_210917, SW1704_210917, WQA08_210917	21-Sep-2017	28-Sep-2017	28-Sep-2017	✓	28-Sep-2017	07-Nov-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080) SW1715_210917, SW1712_210917, SW1707_210917, SW1703_210917, WQA06_210917 - TBW821, WQA08_210917, SW1701_210917, MW0172_210917, MW0146_210917, SW1704_210917, WQA07_210917	21-Sep-2017	28-Sep-2017	05-Oct-2017	✓	28-Sep-2017	05-Oct-2017	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) SW1715_210917, SW1712_210917, SW1707_210917, SW1703_210917, WQA07_210917, SW1701_210917, MW0172_210917, MW0146_210917, SW1704_210917, WQA08_210917	21-Sep-2017	28-Sep-2017	28-Sep-2017	✓	28-Sep-2017	07-Nov-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080) SW1715_210917, SW1712_210917, SW1707_210917, SW1703_210917, WQA06_210917 - TBW821, WQA08_210917, SW1701_210917, MW0172_210917, MW0146_210917, SW1704_210917, WQA07_210917	21-Sep-2017	28-Sep-2017	05-Oct-2017	✓	28-Sep-2017	05-Oct-2017	✓



Matrix: **WATER**

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080)		21-Sep-2017	28-Sep-2017	05-Oct-2017	✓	28-Sep-2017	05-Oct-2017	✓
SW1715_210917,	SW1701_210917,							
SW1712_210917,	MW0172_210917,							
SW1707_210917,	MW0146_210917,							
SW1703_210917,	SW1704_210917,							
WQA06_210917 - TBW821,	WQA07_210917,							
WQA08_210917								
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)		21-Sep-2017	----	----	----	26-Sep-2017	20-Mar-2018	✓
SW1715_210917,	SW1701_210917,							
SW1712_210917,	MW0172_210917,							
SW1707_210917,	MW0146_210917,							
SW1703_210917,	SW1704_210917,							
WQA07_210917,	WQA08_210917							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)		21-Sep-2017	----	----	----	26-Sep-2017	20-Mar-2018	✓
SW1715_210917,	SW1701_210917,							
SW1712_210917,	MW0172_210917,							
SW1707_210917,	MW0146_210917,							
SW1703_210917,	SW1704_210917,							
WQA07_210917,	WQA08_210917							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)		21-Sep-2017	----	----	----	26-Sep-2017	20-Mar-2018	✓
SW1715_210917,	SW1701_210917,							
SW1712_210917,	MW0172_210917,							
SW1707_210917,	MW0146_210917,							
SW1703_210917,	SW1704_210917,							
WQA07_210917,	WQA08_210917							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)		21-Sep-2017	----	----	----	26-Sep-2017	20-Mar-2018	✓
SW1715_210917,	SW1701_210917,							
SW1712_210917,	MW0172_210917,							
SW1707_210917,	MW0146_210917,							
SW1703_210917,	SW1704_210917,							
WQA07_210917,	WQA08_210917							

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
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
SW1715_210917, SW1712_210917, SW1707_210917, SW1703_210917, WQA07_210917, SW1701_210917, MW0172_210917, MW0146_210917, SW1704_210917, WQA08_210917	21-Sep-2017	----	----	----	26-Sep-2017	20-Mar-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: **WATER**

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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In house: Direct injection analysis of fresh waters after dilution (1:1) with methanol. Analysis by LC-Electrospray-MS-MS, Negative Mode using MRM. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.
Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP1710473**

Client : AECOM SERVICES PTY LTD
Contact : [REDACTED]
Address : Supplier ID number - 1179447 LEVEL
6 3 FORREST PLACE
PERTH WA, AUSTRALIA 6000

Laboratory : Environmental Division Perth
Contact : [REDACTED]
Address : 10 Hod Way Malaga WA Australia 6090

E-mail : [REDACTED]
Telephone : +61 08 9326 0100
Facsimile : +61 08 8925 5555

E-mail : [REDACTED]
Telephone : 08 9209 7655
Facsimile : +61-8-9209 7600

Project : 60543717.1.3 Perth Airport Limited
Site Investigation

Page : 1 of 3

Order number : 60543717.1.3

Quote number : EP2017URSWA0001 (EN/004/16)

C-O-C number : ----

QC Level : NEPM 2013 B3 & ALS QC Standard

Site : ----

Sampler : [REDACTED]

Dates

Date Samples Received : 21-Sep-2017 17:25
Client Requested Due Date : 02-Oct-2017

Issue Date : 22-Sep-2017
Scheduled Reporting Date : **02-Oct-2017**

Delivery Details

Mode of Delivery : Carrier
No. of coolers/boxes : 1
Receipt Detail :

Security Seal : Not Available
Temperature : 1.1 - Ice Bricks present
No. of samples received / analysed : 11 / 11

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (SamplesPerth@alsenviro.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**



Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

Any sample identifications that cannot be displayed entirely in the analysis summary table will be listed below.

EP1710473-009 : [21-Sep-2017] : WQA06_210917 - TBW821

Summary of Sample(s) and Requested Analysis

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

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

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - W-04 TRH/BTEXN	WATER - W-18 TRH(C6 - C9)/BTEXN
EP1710473-001	21-Sep-2017 00:00	SW1715_210917	✓	✓	
EP1710473-002	21-Sep-2017 00:00	SW1701_210917	✓	✓	
EP1710473-003	21-Sep-2017 00:00	SW1712_210917	✓	✓	
EP1710473-004	21-Sep-2017 00:00	MW0172_210917	✓	✓	
EP1710473-005	21-Sep-2017 00:00	SW1707_210917	✓	✓	
EP1710473-006	21-Sep-2017 00:00	MW0146_210917	✓	✓	
EP1710473-007	21-Sep-2017 00:00	SW1703_210917	✓	✓	
EP1710473-008	21-Sep-2017 00:00	SW1704_210917	✓	✓	
EP1710473-009	21-Sep-2017 00:00	WQA06_210917 TBW821			✓
EP1710473-010	21-Sep-2017 00:00	WQA07_210917	✓	✓	
EP1710473-011	21-Sep-2017 00:00	WQA08_210917	✓	✓	

Proactive Holding Time Report

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



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email AP_CustomerService.anz@aecom.com

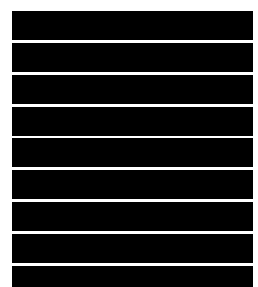
- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)
- EDI Format - XTab (XTAB)

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- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)
- EDI Format - XTab (XTAB)

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□SYDNEY 277-289 Woodpark Road Smithfield NSW 2164
 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
 □TOOWOOMBA 14-15 Desma Court Bohle QLD 4818
 Ph: 07 4796 0600 E: townesville.environmental@alsglobal.com
 □WOLLONGONG 99 Kenny Street Wollongong NSW 2500
 Ph: 02 4225 3125 E: portkembia@alsglobal.com

21/9/17 17:25

Category Seal intact?	Yes	No	(N/A)
Ice/ice bricks present upon ship?	(Yes)	No	N/A
Random Sample Temperature on Receipt	7.1	C	
Other comments			

RECEIVED BY:

2. Struc

DATE/TIME:

21/9/17 17:25

reserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; B = Bag for Acid Sulfate Soils; B = Unpreserved Bag.

CERTIFICATE OF ANALYSIS

Work Order : **EP1710915**
Client : **AECOM Australia Pty Ltd**
Contact : [REDACTED]
Address : LEVEL 6 3 FORREST PLACE
 PERTH WA, AUSTRALIA 6849

Telephone : ----
Project : 60543717.1.3 Perth Airport Limited Site Investigation
Order number : 60543717.1.3
C-O-C number : ----
Sampler : [REDACTED]
Site : ----
Quote number : EN/004/16
No. of samples received : 42
No. of samples analysed : 26

Page : 1 of 21
Laboratory : Environmental Division Perth
Contact : [REDACTED]
Address : 10 Hod Way Malaga WA Australia 6090

Telephone : +61-8-9209 7655
Date Samples Received : 02-Oct-2017 16:15
Date Analysis Commenced : 05-Oct-2017
Issue Date : 12-Oct-2017 13:47



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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
[REDACTED]	Organic Chemist	Sydney Organics, Smithfield, NSW
[REDACTED]	Metals Instrument Chemist	Perth Inorganics, Malaga, WA
[REDACTED]	SENIOR LAB TECH	Perth Organics, Malaga, WA
[REDACTED]	Graduate Chemist	Perth Organics, Malaga, WA



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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Poor surrogate and matrix spike recoveries due to possible sample matrix interferences, confirmed by re-extraction and re-analysis.



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB1701_021017 0.0-0.10	SB1701_021017 0.1-0.5	SB1702_021017 0.0-0.1	SB1702_021017 0.1-0.5	SB1703_021017 0.0-0.1 PFAS jar SB1703_021017 0.0-0.1 A
Client sampling date / time				02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710915-001	EP1710915-002	EP1710915-006	EP1710915-007	EP1710915-011
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	2.2	3.3	5.0	3.4	3.1
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB1701_021017 0.0-0.10	SB1701_021017 0.1-0.5	SB1702_021017 0.0-0.1	SB1702_021017 0.1-0.5	SB1703_021017 0.0-0.1 PFAS jar SB1703_021017 0.0-0.1 A
Client sampling date / time				02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710915-001	EP1710915-002	EP1710915-006	EP1710915-007	EP1710915-011
				Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued								
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.0002	0.0004	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB1701_021017 0.0-0.10	SB1701_021017 0.1-0.5	SB1702_021017 0.0-0.1	SB1702_021017 0.1-0.5	SB1703_021017 0.0-0.1 PFAS jar SB1703_021017 0.0-0.1 A
Client sampling date / time				02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710915-001	EP1710915-002	EP1710915-006	EP1710915-007	EP1710915-011
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<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	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	0.0002	0.0004	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	0.0002	0.0004	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	0.0002	0.0004	<0.0002	<0.0002
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	102	101	106	95.5	78.0
Toluene-D8	2037-26-5	0.2	%	77.8	73.0	78.0	73.3	89.1
4-Bromofluorobenzene	460-00-4	0.2	%	70.4	69.3	71.6	66.4	94.3
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	35.0	61.0	94.0	77.0	101



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB1703_021017 0.1-0.5 PFAS jar SB1703_021017 0.0-0.1 B	SB1704_021017 0.0-0.1	SB1704_021017 0.1-0.5	SB1705_021017 0.0-0.1	SB1705_021017 0.1-0.5
Client sampling date / time				02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710915-012	EP1710915-014	EP1710915-015	EP1710915-017	EP1710915-018
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	3.5	7.8	9.6	6.3	20.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB1703_021017 0.1-0.5 PFAS jar SB1703_021017 0.0-0.1 B	SB1704_021017 0.0-0.1	SB1704_021017 0.1-0.5	SB1705_021017 0.0-0.1	SB1705_021017 0.1-0.5
Client sampling date / time				02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710915-012	EP1710915-014	EP1710915-015	EP1710915-017	EP1710915-018
				Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued								
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.0004	0.0006	<0.0002	0.0009
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB1703_021017 0.1-0.5 PFAS jar SB1703_021017 0.0-0.1 B	SB1704_021017 0.0-0.1	SB1704_021017 0.1-0.5	SB1705_021017 0.0-0.1	SB1705_021017 0.1-0.5
Client sampling date / time				02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710915-012	EP1710915-014	EP1710915-015	EP1710915-017	EP1710915-018
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<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	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	0.0004	0.0008	<0.0002	0.0009
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	0.0004	0.0008	<0.0002	0.0009
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	0.0004	0.0008	<0.0002	0.0009
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	77.1	75.6	76.9	75.8	70.6
Toluene-D8	2037-26-5	0.2	%	89.1	84.1	84.2	85.3	79.1
4-Bromofluorobenzene	460-00-4	0.2	%	95.4	91.1	92.3	92.3	84.6
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	79.0	102	88.0	89.0	94.0



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB1706_021017 0.0-0.1	SB1706_021017 0.1-0.5	SB1707_021017 0.0-0.1	SB1707_021017 0.1-0.5	SB1708_021017 0.0-0.1
Client sampling date / time				02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710915-020	EP1710915-021	EP1710915-023	EP1710915-024	EP1710915-026
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	5.6	4.5	4.9	5.0	7.9
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB1706_021017 0.0-0.1	SB1706_021017 0.1-0.5	SB1707_021017 0.0-0.1	SB1707_021017 0.1-0.5	SB1708_021017 0.0-0.1
Client sampling date / time				02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710915-020	EP1710915-021	EP1710915-023	EP1710915-024	EP1710915-026
				Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued								
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB1706_021017 0.0-0.1	SB1706_021017 0.1-0.5	SB1707_021017 0.0-0.1	SB1707_021017 0.1-0.5	SB1708_021017 0.0-0.1
Client sampling date / time				02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710915-020	EP1710915-021	EP1710915-023	EP1710915-024	EP1710915-026
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<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	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	76.8	75.7	79.3	77.7	76.0
Toluene-D8	2037-26-5	0.2	%	83.9	84.0	88.3	87.2	85.2
4-Bromofluorobenzene	460-00-4	0.2	%	91.2	90.2	93.5	91.6	90.7
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	105	96.0	77.0	91.0	83.0



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB1708_021017 0.1-0.5	SB1709_021017 0.0-0.1	SB1709_021017 0.1-0.5	SB1710_021017 0.0-0.1	SB1710_021017 0.1-0.5
Client sampling date / time				02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710915-027	EP1710915-029	EP1710915-030	EP1710915-035	EP1710915-036
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	13.1	2.9	2.3	4.2	4.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB1708_021017 0.1-0.5	SB1709_021017 0.0-0.1	SB1709_021017 0.1-0.5	SB1710_021017 0.0-0.1	SB1710_021017 0.1-0.5
Client sampling date / time				02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710915-027	EP1710915-029	EP1710915-030	EP1710915-035	EP1710915-036
				Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued								
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SB1708_021017 0.1-0.5	SB1709_021017 0.0-0.1	SB1709_021017 0.1-0.5	SB1710_021017 0.0-0.1	SB1710_021017 0.1-0.5
Client sampling date / time				02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00
Compound	CAS Number	LOR	Unit	EP1710915-027	EP1710915-029	EP1710915-030	EP1710915-035	EP1710915-036
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<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	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	70.4	78.3	77.0	79.8	79.8
Toluene-D8	2037-26-5	0.2	%	76.6	84.4	87.0	86.7	86.7
4-Bromofluorobenzene	460-00-4	0.2	%	81.8	90.0	92.3	88.1	87.8
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	79.0	82.0	84.0	95.0	91.0



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SQA11_021017	SQA14_021017	TBS450	TBS425	----
Client sampling date / time					02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	----
Compound	CAS Number	LOR	Unit		EP1710915-038	EP1710915-039	EP1710915-040	EP1710915-041	-----
					Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		2.3	4.4	<1.0	<1.0	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	----
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	----
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	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SQA11_021017	SQA14_021017	TBS450	TBS425	----
Client sampling date / time					02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	----
Compound	CAS Number	LOR	Unit		EP1710915-038	EP1710915-039	EP1710915-040	EP1710915-041	-----
				Result	Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002		----	----	----
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		----	----	----
Perfluorotridecanoic acid (PFTTrDA)	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)	2448-09-7	0.0005	mg/kg	<0.0005	0.0017		----	----	----
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		----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SQA11_021017	SQA14_021017	TBS450	TBS425	----
Client sampling date / time					02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	02-Oct-2017 00:00	----
Compound	CAS Number	LOR	Unit		EP1710915-038	EP1710915-039	EP1710915-040	EP1710915-041	-----
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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		<0.0002	0.0017	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		78.6	75.5	77.6	80.4	----
Toluene-D8	2037-26-5	0.2	%		89.0	82.3	86.2	89.2	----
4-Bromofluorobenzene	460-00-4	0.2	%		86.9	82.6	86.8	87.7	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		34.0	95.0	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQA09_021017	WQA10_021017	----	----	----
Client sampling date / time					02-Oct-2017 00:00	02-Oct-2017 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EP1710915-042	EP1710915-043	-----	-----	-----
				Result	Result		----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		<2	<2	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQA09_021017	WQA10_021017	----	----	----
Client sampling date / time					02-Oct-2017 00:00	02-Oct-2017 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EP1710915-042	EP1710915-043	-----	-----	-----
				Result	Result		----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQA09_021017	WQA10_021017	----	----	----
Client sampling date / time					02-Oct-2017 00:00	02-Oct-2017 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EP1710915-042	EP1710915-043	-----	-----	-----
				Result	Result		----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%		102	106	----	----	----
Toluene-D8	2037-26-5	2	%		103	102	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		96.2	91.2	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		101	69.4	----	----	----



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	63	132
Toluene-D8	2037-26-5	66	125
4-Bromofluorobenzene	460-00-4	60	124
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	130

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	61	141
Toluene-D8	2037-26-5	73	126
4-Bromofluorobenzene	460-00-4	60	125
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	130

QUALITY CONTROL REPORT

Work Order	: EP1710473	Page	: 1 of 9
Client	: AECOM SERVICES PTY LTD	Laboratory	: Environmental Division Perth
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: Supplier ID number - 1179447 LEVEL 6 3 FORREST PLACE PERTH WA, AUSTRALIA 6000	Address	: 10 Hod Way Malaga WA Australia 6090
Telephone	: +61 08 9326 0100	Telephone	: 08 9209 7655
Project	: 60543717.1.3 Perth Airport Limited Site Investigation	Date Samples Received	: 21-Sep-2017
Order number	: 60543717.1.3	Date Analysis Commenced	: 26-Sep-2017
C-O-C number	: ----	Issue Date	: 02-Oct-2017
Sampler	: [REDACTED]		
Site	: ----		
Quote number	: EN/004/16		
No. of samples received	: 11		
No. of samples analysed	: 11		



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
[REDACTED]	Organic Chemist	Sydney Organics, Smithfield, NSW
[REDACTED]	SENIOR LAB TECH	Perth Organics, Malaga, WA
[REDACTED]	Graduate Chemist	Perth Organics, Malaga, WA
[REDACTED]	Organic Chemist	Perth Organics, Malaga, WA



General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1135845)									
EP1710473-008	SW1704_210917	EP071: C15 - C28 Fraction	----	100	µg/L	<100	160	46.5	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EP1710516-006	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	460	520	12.3	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	150	180	22.8	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1138449)									
EP1710473-001	SW1715_210917	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP1710473-011	WQA08_210917	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1135845)									
EP1710473-008	SW1704_210917	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	100	160	45.4	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP1710516-006	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	220	280	22.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	370	410	11.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1138449)									
EP1710473-001	SW1715_210917	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP1710473-011	WQA08_210917	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 1138449)									
EP1710473-001	SW1715_210917	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
EP080: BTEXN (QC Lot: 1138449) - continued										
EP1710473-001	SW1715_210917	EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.00	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit	
EP1710473-011	WQA08_210917	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit	
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit	
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit	
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit	
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.00	No Limit	
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit	
	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit		
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1133735)										
EP1710473-001	SW1715_210917	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit	
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
ES1723982-061	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit	
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1133735)										
EP1710473-001	SW1715_210917	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit	
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit	
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit	
ES1723982-061	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit	
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit	



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1133735) - continued									
ES1723982-061	Anonymous	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1133735)									
EP1710473-001	SW1715_210917	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ES1723982-061	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1133735)									
EP1710473-001	SW1715_210917	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit

Page : 5 of 9
 Work Order : EP1710473
 Client : AECOM SERVICES PTY LTD
 Project : 60543717.1.3 Perth Airport Limited Site Investigation



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1133735) - continued									
EP1710473-001	SW1715_210917	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ES1723982-061	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 1133735)									
EP1710473-001	SW1715_210917	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.00	No Limit
ES1723982-061	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.00	No Limit



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

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1135845)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	385 µg/L	67.3	35	95
EP071: C15 - C28 Fraction	----	100	µg/L	<100	385 µg/L	74.4	34	111
EP071: C29 - C36 Fraction	----	50	µg/L	<50	398 µg/L	58.0	34	105
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1138449)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	320 µg/L	102	74	113
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1135845)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	380 µg/L	69.4	37	99
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	597 µg/L	67.9	35	108
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	168 µg/L	43.9	11	117
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1138449)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	370 µg/L	103	74	115
EP080: BTEXN (QCLot: 1138449)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	107	84	114
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	102	81	115
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	104	84	113
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	104	84	114
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	103	87	111
EP080: Naphthalene	91-20-3	5	µg/L	<5	20 µg/L	99.8	77	118
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1133735)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.5 µg/L	85.4	70	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.5 µg/L	101	70	130
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.5 µg/L	110	70	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.5 µg/L	98.6	70	130
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.5 µg/L	77.0	70	130
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.5 µg/L	93.2	70	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1133735)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	2.5 µg/L	110	70	130
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.5 µg/L	99.2	70	130
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.5 µg/L	108	70	130
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.5 µg/L	112	70	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.5 µg/L	72.2	70	130
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.5 µg/L	99.0	70	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.5 µg/L	79.8	70	130



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1133735) - continued								
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.5 µg/L	76.2	70	130
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.5 µg/L	95.2	70	130
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.5 µg/L	80.4	70	130
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	1.25 µg/L	102	70	150
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1133735)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.5 µg/L	78.8	70	130
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	1.25 µg/L	111	70	150
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	1.25 µg/L	74.6	70	150
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	1.25 µg/L	73.8	70	150
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	1.25 µg/L	84.6	70	150
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.5 µg/L	99.2	70	130
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.5 µg/L	100	70	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1133735)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.5 µg/L	85.2	70	130
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.5 µg/L	97.2	70	130
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.5 µg/L	117	70	130
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.5 µg/L	95.4	70	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: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1135845)							
EP1710473-008	SW1704_210917	EP071: C10 - C14 Fraction	----	385 µg/L	77.1	45	122
		EP071: C15 - C28 Fraction	----	385 µg/L	88.6	55	143
		EP071: C29 - C36 Fraction	----	398 µg/L	60.1	54	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1138449)							
EP1710473-002	SW1701_210917	EP080: C6 - C9 Fraction	----	240 µg/L	77.6	77	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1135845)							
EP1710473-008	SW1704_210917	EP071: >C10 - C16 Fraction	----	380 µg/L	82.3	45	122
		EP071: >C16 - C34 Fraction	----	597 µg/L	74.4	55	143



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1135845) - continued							
EP1710473-008	SW1704_210917	EP071: >C34 - C40 Fraction	----	168 µg/L	56.4	54	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1138449)							
EP1710473-002	SW1701_210917	EP080: C6 - C10 Fraction	C6_C10	290 µg/L	77.6	77	137
EP080: BTEXN (QCLot: 1138449)							
EP1710473-002	SW1701_210917	EP080: Benzene	71-43-2	20 µg/L	79.8	77	122
		EP080: Toluene	108-88-3	20 µg/L	76.2	74	126
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1133735)							
EP1710473-001	SW1715_210917	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.5 µg/L	105	50	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.5 µg/L	115	50	130
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.5 µg/L	110	50	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.5 µg/L	119	50	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.5 µg/L	88.6	50	130
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.5 µg/L	86.4	50	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1133735)							
EP1710473-001	SW1715_210917	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	2.5 µg/L	112	50	130
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.5 µg/L	108	50	130
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.5 µg/L	124	50	130
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.5 µg/L	127	50	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.5 µg/L	82.2	50	130
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.5 µg/L	112	50	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.5 µg/L	89.0	50	130
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.5 µg/L	84.2	50	130
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.5 µg/L	110	50	130
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.5 µg/L	103	50	130
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	1.25 µg/L	102	50	150
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1133735)							
EP1710473-001	SW1715_210917	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.5 µg/L	66.0	50	130
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	1.25 µg/L	126	50	150
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	1.25 µg/L	87.8	50	150
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	1.25 µg/L	72.0	50	150
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	1.25 µg/L	97.3	50	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.5 µg/L	114	50	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.5 µg/L	105	50	130



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1133735)							
EP1710473-001	SW1715_210917	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.5 µg/L	99.4	50	130
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.5 µg/L	107	50	130
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.5 µg/L	120	50	130
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.5 µg/L	108	50	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EP1710473	Page	: 1 of 6
Client	: AECOM SERVICES PTY LTD	Laboratory	: Environmental Division Perth
Contact	: [REDACTED]	Telephone	: 08 9209 7655
Project	: 60543717.1.3 Perth Airport Limited Site Investigation	Date Samples Received	: 21-Sep-2017
Site	: ----	Issue Date	: 02-Oct-2017
Sampler	: [REDACTED]	No. of samples received	: 11
Order number	: 60543717.1.3	No. of samples analysed	: 11

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **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: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved (EP071) SW1715_210917, SW1701_210917, SW1712_210917, MW0172_210917, SW1707_210917, MW0146_210917, SW1703_210917, SW1704_210917, WQA07_210917, WQA08_210917	21-Sep-2017	28-Sep-2017	28-Sep-2017	✓	28-Sep-2017	07-Nov-2017	✓	
Amber VOC Vial - Sulfuric Acid (EP080) SW1715_210917, SW1701_210917, SW1712_210917, MW0172_210917, SW1707_210917, MW0146_210917, SW1703_210917, SW1704_210917, WQA06_210917 - TBW821, WQA07_210917, WQA08_210917	21-Sep-2017	28-Sep-2017	05-Oct-2017	✓	28-Sep-2017	05-Oct-2017	✓	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Amber Glass Bottle - Unpreserved (EP071) SW1715_210917, SW1701_210917, SW1712_210917, MW0172_210917, SW1707_210917, MW0146_210917, SW1703_210917, SW1704_210917, WQA07_210917, WQA08_210917	21-Sep-2017	28-Sep-2017	28-Sep-2017	✓	28-Sep-2017	07-Nov-2017	✓	
Amber VOC Vial - Sulfuric Acid (EP080) SW1715_210917, SW1701_210917, SW1712_210917, MW0172_210917, SW1707_210917, MW0146_210917, SW1703_210917, SW1704_210917, WQA06_210917 - TBW821, WQA07_210917, WQA08_210917	21-Sep-2017	28-Sep-2017	05-Oct-2017	✓	28-Sep-2017	05-Oct-2017	✓	



Matrix: **WATER**

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080)		21-Sep-2017	28-Sep-2017	05-Oct-2017	✓	28-Sep-2017	05-Oct-2017	✓
SW1715_210917,	SW1701_210917,							
SW1712_210917,	MW0172_210917,							
SW1707_210917,	MW0146_210917,							
SW1703_210917,	SW1704_210917,							
WQA06_210917 - TBW821,	WQA07_210917,							
WQA08_210917								
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)		21-Sep-2017	----	----	----	26-Sep-2017	20-Mar-2018	✓
SW1715_210917,	SW1701_210917,							
SW1712_210917,	MW0172_210917,							
SW1707_210917,	MW0146_210917,							
SW1703_210917,	SW1704_210917,							
WQA07_210917,	WQA08_210917							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)		21-Sep-2017	----	----	----	26-Sep-2017	20-Mar-2018	✓
SW1715_210917,	SW1701_210917,							
SW1712_210917,	MW0172_210917,							
SW1707_210917,	MW0146_210917,							
SW1703_210917,	SW1704_210917,							
WQA07_210917,	WQA08_210917							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)		21-Sep-2017	----	----	----	26-Sep-2017	20-Mar-2018	✓
SW1715_210917,	SW1701_210917,							
SW1712_210917,	MW0172_210917,							
SW1707_210917,	MW0146_210917,							
SW1703_210917,	SW1704_210917,							
WQA07_210917,	WQA08_210917							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)		21-Sep-2017	----	----	----	26-Sep-2017	20-Mar-2018	✓
SW1715_210917,	SW1701_210917,							
SW1712_210917,	MW0172_210917,							
SW1707_210917,	MW0146_210917,							
SW1703_210917,	SW1704_210917,							
WQA07_210917,	WQA08_210917							

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
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
SW1715_210917,	SW1701_210917,	21-Sep-2017	----	----	----	26-Sep-2017	20-Mar-2018
SW1712_210917,	MW0172_210917,						✓
SW1707_210917,	MW0146_210917,						
SW1703_210917,	SW1704_210917,						
WQA07_210917,	WQA08_210917						



Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Regular	Actual	Expected		Evaluation
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In house: Direct injection analysis of fresh waters after dilution (1:1) with methanol. Analysis by LC-Electrospray-MS-MS, Negative Mode using MRM. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.
Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP1710473**

Client : AECOM SERVICES PTY LTD
Contact : [REDACTED]
Address : Supplier ID number - 1179447 LEVEL
6 3 FORREST PLACE
PERTH WA, AUSTRALIA 6000

Laboratory : Environmental Division Perth
Contact : [REDACTED]
Address : 10 Hod Way Malaga WA Australia 6090

E-mail : [REDACTED]
Telephone : +61 08 9326 0100
Facsimile : +61 08 8925 5555

E-mail : [REDACTED]
Telephone : 08 9209 7655
Facsimile : +61-8-9209 7600

Project : 60543717.1.3 Perth Airport Limited
Site Investigation

Page : 1 of 3

Order number : 60543717.1.3

Quote number : EP2017URSWA0001 (EN/004/16)

C-O-C number : ----

QC Level : NEPM 2013 B3 & ALS QC Standard

Site : ----

Sampler : [REDACTED]

Dates

Date Samples Received : 21-Sep-2017 17:25
Client Requested Due Date : 02-Oct-2017

Issue Date : 22-Sep-2017
Scheduled Reporting Date : **02-Oct-2017**

Delivery Details

Mode of Delivery : Carrier
No. of coolers/boxes : 1
Receipt Detail :

Security Seal : Not Available
Temperature : 1.1 - Ice Bricks present
No. of samples received / analysed : 11 / 11

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (SamplesPerth@alsenviro.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**



Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

Any sample identifications that cannot be displayed entirely in the analysis summary table will be listed below.

EP1710473-009 : [21-Sep-2017] : WQA06_210917 - TBW821

Summary of Sample(s) and Requested Analysis

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

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

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - W-04 TRH/BTEXN	WATER - W-18 TRH(C6 - C9)/BTEXN
EP1710473-001	21-Sep-2017 00:00	SW1715_210917	✓	✓	
EP1710473-002	21-Sep-2017 00:00	SW1701_210917	✓	✓	
EP1710473-003	21-Sep-2017 00:00	SW1712_210917	✓	✓	
EP1710473-004	21-Sep-2017 00:00	MW0172_210917	✓	✓	
EP1710473-005	21-Sep-2017 00:00	SW1707_210917	✓	✓	
EP1710473-006	21-Sep-2017 00:00	MW0146_210917	✓	✓	
EP1710473-007	21-Sep-2017 00:00	SW1703_210917	✓	✓	
EP1710473-008	21-Sep-2017 00:00	SW1704_210917	✓	✓	
EP1710473-009	21-Sep-2017 00:00	WQA06_210917 TBW821			✓
EP1710473-010	21-Sep-2017 00:00	WQA07_210917	✓	✓	
EP1710473-011	21-Sep-2017 00:00	WQA08_210917	✓	✓	

Proactive Holding Time Report

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



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email



- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)
- EDI Format - XTab (XTAB)

Email

Email

Email

Email

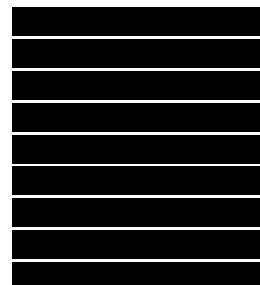
Email

Email

Email

Email

Email



- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)
- EDI Format - XTab (XTAB)

Email

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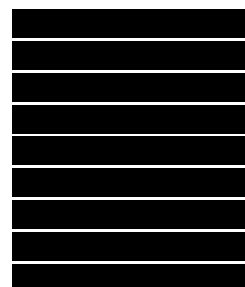
Email

Email

Email

Email

Email



urma Road Pooraka SA 5095
E: adelaide@alsglobal.com
Shand Street Stafford QLD 4053
E: samples.brisbane@alsglobal.com
6 Callamondah Drive Clinton QLD 4680
E: gladstone@alsglobal.com

UMACKAY 78 Harbour Road Mackay QLD 4740
Ph: 07 4944 0177 E: mackay@alsglobal.com
MELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
MUDGEEE 27 Sydney Road Mudgee NSW 2850
Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304
Ph: 05 4968 9433 E: samples.newcastle@alsglobal.com
NOWRA 4713 Geary Place North Nowra NSW 2541
Ph: 024423 2053 E: nowra@alsglobal.com
PERTH 10 Hod Way Malaga WA 6080
Ph: 08 9209 7655 E: samples.perth@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164
Ph: 02 8674 8556 E: samples.sydney@alsglobal.com
TOWNSVILLE 1415 Desma Court Gorme QLD 4818
Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembia@alsglobal.com

TURNAROUND REQUIREMENTS :

- ☐ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:

FILE: [REDACTED]
(or default):

com.com

rad

RELINQUISHED BY:

Sally Ascott

DATE/TIME:

/09/2017

RECEIVED BY:

1605
CIVIC NIK

DATE/TIME:

RELINQUISHED BY:

DATE/TIME:

RECEIVED BY:

D. Strack

DATE/TIME:

21/9/17 17:25

FOR LABORATORY USE ONLY (Circle)

Seal Intact? Yes No (N/A)
Ice packs/freeze bricks present upon receipt? YES No N/A
Sample? [REDACTED]
Random Sample Temperature on Receipt? [REDACTED] C
Other comment: [REDACTED]

CONTAINER INFORMATION			ANALYSIS REQUIRED including SUITES (NB, Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).			Additional Information	
MATRIX	TYPE & PRESERVATIVE (codes below)	(refer to)	TOTAL CONTAINERS	EP231X - PFAS Full Suite	TRH (C6- C40)/BTEXN	Environmental Division Perth Work Order Reference EP1710473  Telephone : + 61-8-9209 7655	
W				X	X		
W				X	X		
W				X	X		
W				X	X		
W				X	X		
W				X	X		
W				X	X		
W				X	X		
W				X	X		
W				X	X		
W				X	X		
TOTAL						Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. LAB MATRIX SPIKE + LAB DUPLICATE ADDED [Handwritten signatures and notes]	

reserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
ic Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
ic Bag for Acid Sulphate Soils; B = Unpreserved Bag.



CHAIN OF CUSTODY

ALS Laboratory: please tick →

GLADELIDE 21 Burma Road, Portlanka SA 5038
Ph: 08 8759 0900 E: gladelide@alsglobal.com

QBRIDGEMANE 2 Grah Street, Stafford QLD 4053
Ph: 07 3243 7222 E: samples.qbridgemane@alsglobal.com

GLADESTONE 46 Callenderdon Drive, Clinton QLD 4861
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WARRAW 190 Sydney Road, Mudgee NSW 2850
Ph: 02 6972 0775 E: mudgee@alsglobal.com

Aecom Australia Pty Ltd		TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)		☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):		FOR LABORATORY USE ONLY (Circle) Custody Seal Intact? Yes No N/A Free ice / frozen ice bricks present upon receipt? Yes No N/A Random Sample Temperature on Receipt: °C Other comment:	
OFFICE: Perth		PROJECT NO.:		PROJECT NO.:		COC SEQUENCE NUMBER (Circle)	
PROJECT: Perth Airport LSI		PROJECT NO.:		PROJECT NO.:		COC: 1 2 3 4 5 6 7	
ORDER NUMBER: 6054		PURCHASE ORDER NO.:		COUNTRY OF ORIGIN:		OF: 1 2 3 4 5 6 7	
PROJECT MANAGER:		CONTACT PH:		RECEIVED BY:		RECEIVED BY:	
SAMPLER:		SAMPLER MOBILE:		DATE/TIME:		DATE/TIME:	
COC Emailed to ALS? (YES / NO)		EOD FORMAT (or default):		DATE/TIME:		DATE/TIME:	
Email Reports to (will default to PM if no other addresses are listed):		DATE/TIME:		DATE/TIME:		DATE/TIME:	
Email Invoice to (will default to PM if no other addresses are listed):		DATE/TIME:		DATE/TIME:		DATE/TIME:	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB, Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	PFAS Full Suite	TRH/BTEX	TPH (total petroleum hydrocarbon), TRH (total recovery hydrocarbon), BTEX (benzene, toluene, ethylbenzene, xylene, and naphthalene), PAH (polycyclic aromatic hydrocarbons), MBAS (methylene blue active substances), and PFAS (fluorinated as per ALS extended PFAS suite).	TRH (c8-c10) and BTEX							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.	
1	SS04_041017	4/10/2017 0:00	S	(1 x 250mL Glass Jar, 1 x PFAS Jar)	2			x									
2	SS05_041017	4/10/2017 0:00	S	(1 x 250mL Glass Jar, 1 x PFAS Jar)	2			x									
3	SS06_041017	4/10/2017 0:00	S	(1 x 250mL Glass Jar, 1 x PFAS Jar)	2			x									
4	SS07_041017	4/10/2017 0:00	S	(1 x 250mL Glass Jar, 1 x PFAS Jar)	2			x									
5	SQA01_041017	4/10/2017 0:00	S	(1 x 250mL Glass Jar, 1 x PFAS Jar)	2			x									
6	SQA03_041017	4/10/2017 0:00	S	(1 x 150mL Glass Jar)	1				X								
7	ONW5_041017	4/10/2017 0:00	W	(2 x 100mL Orange Amber, 2 x 40mL Purple Vials, 1 x 60mL PFAS bottle)	5	X	X										
8	MWFTG-1_041017	4/10/2017 0:00	W	(2 x 100mL Orange Amber, 2 x 40mL Purple Vials, 1 x 60mL PFAS bottle)	5			x									
9	MWFTG-2_041017	4/10/2017 0:00	W	(2 x 100mL Orange Amber, 2 x 40mL Purple Vials, 1 x 60mL PFAS bottle)	5			x									
10	MWFTG-3_041017	4/10/2017 0:00	W	(1 x 100mL Orange Amber, 2 x 40mL Purple Vials, 1 x 60mL PFAS bottle)	4			X									
11	MW0154_031017	3/10/2017 0:00	W	(2 x 100mL Orange Amber, 2 x 40mL Purple Vials, 1 x 60mL PFAS bottle)	5	X	X										
12	MW0180_031017	3/10/2017 0:00	W	(2 x 100mL Orange Amber, 2 x 40mL Purple Vials, 1 x 60mL PFAS bottle)	5	X	X										
TOTAL																	

Environmental Division
Perth
Work Order Reference
EP1711070



Telephone : + 61-8-9209 7655

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugol's Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

Environmental Division
Perth
Work Order Reference
EP1711070



Telephone : 61-8-9209 7655



CHAIN OF CUSTODY

ALS Laboratory: please tick →

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Ph: 08 9447 1111 E: perth@als.com.au
3400/1/01/01 Perth Road Perth WA 6005
Ph: 08 9447 1111 E: perth@als.com.au
3400/1/01/01 Perth Road Perth WA 6005
Ph: 08 9447 1111 E: perth@als.com.au

Aecom Australia Pty Ltd		TURNAROUND REQUIREMENTS : ☐ Standard TAT (List due date):		FOR LABORATORY USE ONLY (Circle)	
OFFICE: Perth		(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)		Custody Seal Intact? Yes No N/A	
PROJECT: Perth Airport LSI		PROJECT NO.:		Free ice / frozen ice bricks present upon receipt? Yes No N/A	
ORDER NUMBER: 6054		PURCHASE ORDER NO.:		Random Sample Temperature on Receipt: °C	
PROJECT MANAGER: [REDACTED]		CONTACT PH: [REDACTED]		Other comment:	
SAMPLER:		SAMPLER MOBILE:		RELINQUISHED BY:	
COC Emailed to ALS? (YES / NO)		EDD FORMAT (or default):		RECEIVED BY:	
Email Reports to (will default to PM if no other addresses are listed):		DATE/TIME:		DATE/TIME:	
Email Invoice to (will default to PM if no other addresses are listed):		DATE/TIME:		DATE/TIME:	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	PFAS Full Suite	TRHIBTEXN	TRW (c6-c10) and BTEX									Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
13	MW1706_041017	4/10/2017 0:00	W	(1 x 100mL Orange Amber, 2 x 40mL Purple Vials, 1 x 60mL PFAS bottle)	4	X	X										
14	SW1706_031017	3/10/2017 0:00	W	(2 x 100mL Orange Amber, 2 x 40mL Purple Vials, 1 x 60mL PFAS bottle)	5	X	X										
15	SW1716_031017	3/10/2017 0:00	W	(1 x 100mL Orange Amber, 2 x 40mL Purple Vials, 1 x 60mL PFAS bottle)	4	X	X										
16	SW1720_041017	4/10/2017 0:00	W	(1 x 100mL Orange Amber, 2 x 40mL Purple Vials, 1 x 60mL PFAS bottle)	4	X	X										
17	WQA01_031017	3/10/2017 0:00	W	(1 x 100mL Orange Amber, 2 x 40mL Purple Vials, 1 x 60mL PFAS bottle)	4	X	X										
18	WQA03_031017	3/10/2017 0:00	W	(1 x 100mL Orange Amber, 2 x 40mL Purple Vials)	3	X	X										
19	WQA04_031017	3/10/2017 0:00	W	(1 x 100mL Orange Amber, 2 x 40mL Purple Vials)	3	X	X										
20	WQA05_041017	4/10/2017 0:00	W	(1 x 100mL Orange Amber, 2 x 40mL Purple Vials, 1 x 60mL PFAS bottle)	4	X	X										
21	WQA07_041017	4/10/2017 0:00	W	(1 x 100mL Orange Amber, 2 x 40mL Purple Vials)	3	X	X										
22	WQA08_041017	4/10/2017 0:00	W	(1 x 100mL Orange Amber, 2 x 40mL Purple Vials)	3	X	X										
23	WQA09_041017	4/10/2017 0:00	W	(1 x 40mL Purple Vial)	1			X									
24	WQA10_041017	4/10/2017 0:00	W	(1 x 40mL Purple Vial)	1			X									
TOTAL																	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugol's Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP1711124**

Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Perth
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: LEVEL 6 3 FORREST PLACE PERTH WA, AUSTRALIA 6849	Address	: 10 Hod Way Malaga WA Australia 6090
E-mail	: [REDACTED]	E-mail	: [REDACTED]
Telephone	: +61 02 8934 0000	Telephone	: +61-8-9209 7655
Facsimile	: +61 02 8934 0001	Facsimile	: +61-8-9209 7600
Project	: 60543717.1.3 Perth Airport Limited Site Investigation	Page	: 1 of 3
Order number	: 60543717.1.3	Quote number	: EB2015AECOMAU0580 (EN/004/16)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: PERTH AIRPORT		
Sampler	: [REDACTED]		

Dates

Date Samples Received	: 06-Oct-2017 17:30	Issue Date	: 09-Oct-2017
Client Requested Due Date	: 16-Oct-2017	Scheduled Reporting Date	: 16-Oct-2017

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 7.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (SamplesPerth@alsenviro.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**



Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

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

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

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - W-04 TRH/BTEXN	WATER - W-18 TRH(C6 - C9)/BTEXN
EP1711124-001	[06-Oct-2017]	WQA11_061017	✓	✓	
EP1711124-002	[06-Oct-2017]	WQA13_061017		✓	
EP1711124-003	[06-Oct-2017]	WQA14_061017		✓	
EP1711124-004	[06-Oct-2017]	WQA15_061017			✓
EP1711124-005	[06-Oct-2017]	SW1717_061017	✓	✓	
EP1711124-006	[06-Oct-2017]	SW1718_061017	✓	✓	
EP1711124-007	[06-Oct-2017]	MW0221_061017	✓	✓	
EP1711124-008	[06-Oct-2017]	MW0220_061017	✓	✓	
EP1711124-009	[06-Oct-2017]	MW1705_061017	✓	✓	
EP1711124-010	[06-Oct-2017]	MW1704_061017	✓	✓	

Proactive Holding Time Report

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



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email

[REDACTED]

- Chain of Custody (CoC) (COC)

Email

[REDACTED]

[REDACTED]

- *AU Certificate of Analysis - NATA (COA)

Email

[REDACTED]

- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)

Email

[REDACTED]

- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)

Email

[REDACTED]

- A4 - AU Sample Receipt Notification - Environmental HT (SRN)

Email

[REDACTED]

- Chain of Custody (CoC) (COC)

Email

[REDACTED]

- EDI Format - ENMRG (ENMRG)

Email

[REDACTED]

- EDI Format - EQUIS V5 URS (EQUIS_V5_AECOM)

Email

[REDACTED]

- EDI Format - ESDAT (ESDAT)

Email

[REDACTED]

- EDI Format - XTab (XTAB)

Email

[REDACTED]

- Electronic SRN for EQUIS (ESRN_EQUIS)

Email

[REDACTED]

[REDACTED]

- *AU Certificate of Analysis - NATA (COA)

Email

[REDACTED]

- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)

Email

[REDACTED]

- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)

Email

[REDACTED]

- A4 - AU Sample Receipt Notification - Environmental HT (SRN)

Email

[REDACTED]

- Chain of Custody (CoC) (COC)

Email

[REDACTED]

- EDI Format - ENMRG (ENMRG)

Email

[REDACTED]

- EDI Format - EQUIS V5 URS (EQUIS_V5_AECOM)

Email

[REDACTED]

- EDI Format - ESDAT (ESDAT)

Email

[REDACTED]

- EDI Format - XTab (XTAB)

Email

[REDACTED]

- Electronic SRN for EQUIS (ESRN_EQUIS)

Email

[REDACTED]

[REDACTED]

- *AU Certificate of Analysis - NATA (COA)

Email

[REDACTED]

- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)

Email

[REDACTED]

- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)

Email

[REDACTED]

- A4 - AU Sample Receipt Notification - Environmental HT (SRN)

Email

[REDACTED]

- Chain of Custody (CoC) (COC)

Email

[REDACTED]

- EDI Format - ENMRG (ENMRG)

Email

[REDACTED]

- EDI Format - EQUIS V5 URS (EQUIS_V5_AECOM)

Email

[REDACTED]

- EDI Format - ESDAT (ESDAT)

Email

[REDACTED]

- EDI Format - XTab (XTAB)

Email

[REDACTED]

- Electronic SRN for EQUIS (ESRN_EQUIS)

Email

[REDACTED]

CHAIN OF CUSTODY DOCUMENTATION



CLIENT: AECOM Services Pty Ltd	SAMPLER: [REDACTED]
ADDRESS / OFFICE: Level 6, 3 Forrest Place, Perth, 6000	MOBILE: [REDACTED]
PROJECT MANAGER: [REDACTED]	PHONE: [REDACTED]
PROJECT ID: <u>PERTH 60543717 - 1.3</u>	EMAIL REPORT TO: [REDACTED]
SITE: <u>PERTH AIRPORT</u>	EMAIL INVOICE TO: [REDACTED]
RESULTS REQUIRED: Standard TA	Quote No. EN/004/16

FOR LABORATORY USE ONLY	COMMENTS / SPECIAL HANDLING / STORAGE OF DISPOSAL:
COOLER SEAL (circle appropriate)	
Intact: Yes No N/A	
SAMPLE TEMPERATURE	
CHILLED: Yes No	

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION			ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)											
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	MSpike Vol												
1	WQA11-061017	W	6-10-17					X	X										
2	WQA13-061017	W	6-10-17						X										
3	WQA14-061017	W	6-10-17						X										
4	WQA15-061017	W	6-10-17							X									
5	SW1717-061017	W	6-10-17					X	X										
6	SW1718-061017	W	6-10-17					X	X										
7	MW0221-061017	W	6-10-17					X	X										
Y	MW0220-061017	W	6-10-17					X	X										
5	MN1705-061017	W	6-10-17					X	X										
6	MN1704-061017	W	6-10-17					X	X										

RELINQUISHED BY:				RECEIVED BY:				METHOD OF SHIPMENT	
Name: <u>Cameron Ritchie</u>	Date: 6/07/2017	Name: [REDACTED]	Date: 6/10/17	Con' Note No:					
Of: AECOM	Time: 800	Of: [REDACTED]	Time: 1730	Transport Co:					
Name:	Date:	Name:	Date:						
Of:	Time:	Of:	Time:						

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CERTIFICATE OF ANALYSIS

Work Order : **EP1711124**
Client : **AECOM Australia Pty Ltd**
Contact : [REDACTED]
Address : LEVEL 6 3 FORREST PLACE
 PERTH WA, AUSTRALIA 6849
Telephone : +61 02 8934 0000
Project : 60543717.1.3 Perth Airport Limited Site Investigation
Order number : 60543717.1.3
C-O-C number : ----
Sampler : [REDACTED]
Site : PERTH AIRPORT
Quote number : EN/004/16
No. of samples received : 10
No. of samples analysed : 10

Page : 1 of 9
Laboratory : Environmental Division Perth
Contact : [REDACTED]
Address : 10 Hod Way Malaga WA Australia 6090
Telephone : +61-8-9209 7655
Date Samples Received : 06-Oct-2017 17:30
Date Analysis Commenced : 12-Oct-2017
Issue Date : 17-Oct-2017 13:36



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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
[REDACTED]	Organic Chemist	Sydney Organics, Smithfield, NSW
[REDACTED]	Graduate Chemist	Perth Organics, Malaga, WA
[REDACTED]	Organic Chemist	Perth Organics, Malaga, WA



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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				WQA11_061017	WQA13_061017	WQA14_061017	WQA15_061017	SW1717_061017
Client sampling date / time				[06-Oct-2017]	[06-Oct-2017]	[06-Oct-2017]	[06-Oct-2017]	[06-Oct-2017]
Compound	CAS Number	LOR	Unit	EP1711124-001	EP1711124-002	EP1711124-003	EP1711124-004	EP1711124-005
				Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	----	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	----	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	----	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	----	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	----	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	----	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	----	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	----	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	----	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.07	----	----	----	0.67
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.07	----	----	----	0.81
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.88	----	----	----	4.37
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.06	----	----	----	0.43
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	2.45	----	----	----	15.0

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQA11_061017	WQA13_061017	WQA14_061017	WQA15_061017	SW1717_061017
Client sampling date / time				[06-Oct-2017]	[06-Oct-2017]	[06-Oct-2017]	[06-Oct-2017]	[06-Oct-2017]	
Compound	CAS Number	LOR	Unit	EP1711124-001	EP1711124-002	EP1711124-003	EP1711124-004	EP1711124-005	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	----	----	----	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	----	----	----	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	----	----	----	0.29	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.13	----	----	----	1.21	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	----	----	----	0.31	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.05	----	----	----	0.42	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	----	----	----	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	----	----	----	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	----	----	----	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	----	----	----	<0.02	
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	----	----	----	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	----	----	----	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	----	----	----	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	----	----	----	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	----	----	----	<0.05	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	----	----	----	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	----	----	----	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	----	----	----	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	----	----	----	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Client sample ID

				WQA11_061017	WQA13_061017	WQA14_061017	WQA15_061017	SW1717_061017
Client sampling date / time				[06-Oct-2017]	[06-Oct-2017]	[06-Oct-2017]	[06-Oct-2017]	[06-Oct-2017]
Compound	CAS Number	LOR	Unit	EP1711124-001	EP1711124-002	EP1711124-003	EP1711124-004	EP1711124-005
				Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	----	----	----	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	----	----	----	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	----	----	----	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	----	----	----	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	3.71	----	----	----	23.5
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	3.33	----	----	----	19.4
Sum of PFAS (WA DER List)	----	0.01	µg/L	3.58	----	----	----	22.3
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	2	%	106	107	116	109	109
Toluene-D8	2037-26-5	2	%	106	100	100	97.7	99.6
4-Bromofluorobenzene	460-00-4	2	%	90.2	92.9	90.4	89.5	90.4
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	76.6	----	----	----	85.3



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				SW1718_061017	MW0221_061017	MW0220_061017	MW1705_061017	MW1704_061017
Client sampling date / time				[06-Oct-2017]	[06-Oct-2017]	[06-Oct-2017]	[06-Oct-2017]	[06-Oct-2017]
Compound	CAS Number	LOR	Unit	EP1711124-006	EP1711124-007	EP1711124-008	EP1711124-009	EP1711124-010
				Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	66.1	0.06	0.10
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.04	0.02	78.0	0.09	0.52
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.68	0.21	339	1.07	11.3
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.02	<0.02	41.2	0.08	0.24
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.33	0.68	778	2.72	15.8

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW1718_061017	MW0221_061017	MW0220_061017	MW1705_061017	MW1704_061017
Client sampling date / time				[06-Oct-2017]	[06-Oct-2017]	[06-Oct-2017]	[06-Oct-2017]	[06-Oct-2017]	
Compound	CAS Number	LOR	Unit	EP1711124-006	EP1711124-007	EP1711124-008	EP1711124-009	EP1711124-010	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	7.5	<0.1	0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	21.1	<0.02	0.31	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.06	0.04	97.5	0.15	1.56	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	25.0	<0.02	0.24	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.02	<0.01	32.6	0.05	0.27	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.46	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Client sample ID

				SW1718_061017	MW0221_061017	MW0220_061017	MW1705_061017	MW1704_061017
Client sampling date / time				[06-Oct-2017]	[06-Oct-2017]	[06-Oct-2017]	[06-Oct-2017]	[06-Oct-2017]
Compound	CAS Number	LOR	Unit	EP1711124-006	EP1711124-007	EP1711124-008	EP1711124-009	EP1711124-010
				Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.31	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	2.15	0.95	1490	4.22	30.4
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	2.01	0.89	1120	3.79	27.1
Sum of PFAS (WA DER List)	----	0.01	µg/L	2.09	0.93	1370	4.05	29.7
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	2	%	112	114	103	112	114
Toluene-D8	2037-26-5	2	%	96.1	101	102	83.1	105
4-Bromofluorobenzene	460-00-4	2	%	93.1	105	90.1	88.0	88.7
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	75.1	76.6	74.7	99.3	87.4



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	61	141
Toluene-D8	2037-26-5	73	126
4-Bromofluorobenzene	460-00-4	60	125
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	130

QUALITY CONTROL REPORT

Work Order	: EP1711124	Page	: 1 of 9
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Perth
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: LEVEL 6 3 FORREST PLACE PERTH WA, AUSTRALIA 6849	Address	: 10 Hod Way Malaga WA Australia 6090
Telephone	: +61 02 8934 0000	Telephone	: +61-8-9209 7655
Project	: 60543717.1.3 Perth Airport Limited Site Investigation	Date Samples Received	: 06-Oct-2017
Order number	: 60543717.1.3	Date Analysis Commenced	: 12-Oct-2017
C-O-C number	: ----	Issue Date	: 17-Oct-2017
Sampler	: [REDACTED]		
Site	: PERTH AIRPORT		
Quote number	: EN/004/16		
No. of samples received	: 10		
No. of samples analysed	: 10		



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
[REDACTED]	Organic Chemist	Sydney Organics, Smithfield, NSW
[REDACTED]	Graduate Chemist	Perth Organics, Malaga, WA
[REDACTED]	Organic Chemist	Perth Organics, Malaga, WA



General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1162341)									
EP1711124-005	SW1717_061017	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EP1711124-010	MW1704_061017	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1166565)									
EP1710972-017	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP1711124-008	MW0220_061017	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1162341)									
EP1711124-005	SW1717_061017	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP1711124-010	MW1704_061017	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1166565)									
EP1710972-017	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP1711124-008	MW0220_061017	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 1166565)									
EP1710972-017	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 1166565) - continued									
EP1710972-017	Anonymous	EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
EP1711124-008	MW0220_061017	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit	
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1164037)									
EP1711124-001	WQA11_061017	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	2.45	2.24	8.98	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.07	0.06	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.07	0.09	16.1	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.88	0.88	0.00	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.06	0.08	24.3	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP1711134-004	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1164037)									
EP1711124-001	WQA11_061017	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.05	0.05	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.13	0.12	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
EP1711134-004	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1164037) - continued									
EP1711134-004	Anonymous	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1164037)									
EP1711124-001	WQA11_061017	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP1711134-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1164037)									
EP1711124-001	WQA11_061017	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit

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 Work Order : EP1711124
 Client : AECOM Australia Pty Ltd
 Project : 60543717.1.3 Perth Airport Limited Site Investigation



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1164037) - continued									
EP1711124-001	WQA11_061017	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP1711134-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 1164037)									
EP1711124-001	WQA11_061017	EP231X: Sum of PFAS	----	0.01	µg/L	3.71	3.52	5.26	0% - 20%
EP1711134-004	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.00	No Limit



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

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result			LCS	Low
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1162341)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	385 µg/L	54.9	35	95
EP071: C15 - C28 Fraction	----	100	µg/L	<100	385 µg/L	61.4	34	111
EP071: C29 - C36 Fraction	----	50	µg/L	<50	398 µg/L	53.3	34	105
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1166565)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	320 µg/L	101	74	113
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1162341)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	380 µg/L	57.8	37	99
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	597 µg/L	58.3	35	108
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	168 µg/L	60.9	11	117
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1166565)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	370 µg/L	104	74	115
EP080: BTEXN (QCLot: 1166565)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	91.3	84	114
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	106	81	115
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	103	84	113
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	105	84	114
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	104	87	111
EP080: Naphthalene	91-20-3	5	µg/L	<5	20 µg/L	93.6	77	118
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1164037)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.5 µg/L	88.0	70	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.5 µg/L	92.8	70	130
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.5 µg/L	89.8	70	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.5 µg/L	93.0	70	130
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.5 µg/L	90.4	70	130
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.5 µg/L	82.8	70	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1164037)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	2.5 µg/L	91.0	70	130
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.5 µg/L	87.4	70	130
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.5 µg/L	85.0	70	130
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.5 µg/L	98.6	70	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.5 µg/L	80.4	70	130
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.5 µg/L	85.8	70	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.5 µg/L	96.0	70	130



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) LowHigh	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1164037) - continued								
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.5 µg/L	89.8	70	130
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.5 µg/L	119	70	130
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.5 µg/L	74.0	70	130
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	1.25 µg/L	87.4	70	150
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1164037)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.5 µg/L	83.8	70	130
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	1.25 µg/L	96.8	70	150
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	1.25 µg/L	92.1	70	150
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	1.25 µg/L	115	70	150
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	1.25 µg/L	139	70	150
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.5 µg/L	74.0	70	130
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.5 µg/L	90.2	70	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1164037)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.5 µg/L	82.4	70	130
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.5 µg/L	83.2	70	130
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.5 µg/L	83.6	70	130
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.5 µg/L	71.4	70	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: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1162341)							
EP1711124-007	MW0221_061017	EP071: C10 - C14 Fraction	----	385 µg/L	57.0	45	122
		EP071: C15 - C28 Fraction	----	385 µg/L	62.4	55	143
		EP071: C29 - C36 Fraction	----	398 µg/L	58.9	54	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1166565)							
EP1710972-018	Anonymous	EP080: C6 - C9 Fraction	----	240 µg/L	103	77	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1162341)							
EP1711124-007	MW0221_061017	EP071: >C10 - C16 Fraction	----	380 µg/L	59.5	45	122
		EP071: >C16 - C34 Fraction	----	597 µg/L	61.5	55	143



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1162341) - continued							
EP1711124-007	MW0221_061017	EP071: >C34 - C40 Fraction	----	168 µg/L	68.3	54	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1166565)							
EP1710972-018	Anonymous	EP080: C6 - C10 Fraction	C6_C10	290 µg/L	101	77	137
EP080: BTEXN (QCLot: 1166565)							
EP1710972-018	Anonymous	EP080: Benzene	71-43-2	20 µg/L	98.4	77	122
		EP080: Toluene	108-88-3	20 µg/L	110	74	126
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1164037)							
EP1711124-001	WQA11_061017	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.5 µg/L	93.2	50	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.5 µg/L	116	50	130
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.5 µg/L	84.6	50	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.5 µg/L	82.8	50	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.5 µg/L	# Not Determined	50	130
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.5 µg/L	83.6	50	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1164037)							
EP1711124-001	WQA11_061017	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	2.5 µg/L	80.8	50	130
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.5 µg/L	98.4	50	130
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.5 µg/L	97.8	50	130
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.5 µg/L	126	50	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.5 µg/L	80.0	50	130
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.5 µg/L	96.6	50	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.5 µg/L	101	50	130
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.5 µg/L	85.8	50	130
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.5 µg/L	128	50	130
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.5 µg/L	64.4	50	130
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	1.25 µg/L	57.4	50	150
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1164037)							
EP1711124-001	WQA11_061017	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.5 µg/L	83.2	50	130
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	1.25 µg/L	99.0	50	150
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	1.25 µg/L	91.8	50	150
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	1.25 µg/L	115	50	150
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	1.25 µg/L	130	50	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.5 µg/L	85.2	50	130

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 Work Order : EP1711124
 Client : AECOM Australia Pty Ltd
 Project : 60543717.1.3 Perth Airport Limited Site Investigation



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1164037) - continued							
EP1711124-001	WQA11_061017	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.5 µg/L	90.2	50	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1164037)							
EP1711124-001	WQA11_061017	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.5 µg/L	88.4	50	130
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.5 µg/L	93.8	50	130
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.5 µg/L	83.8	50	130
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.5 µg/L	51.8	50	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EP1711124	Page	: 1 of 6
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Perth
Contact	: [REDACTED]	Telephone	: +61-8-9209 7655
Project	: 60543717.1.3 Perth Airport Limited Site Investigation	Date Samples Received	: 06-Oct-2017
Site	: PERTH AIRPORT	Issue Date	: 17-Oct-2017
Sampler	: [REDACTED]	No. of samples received	: 10
Order number	: 60543717.1.3	No. of samples analysed	: 10

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EP1711124--001	WQA11_061017	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

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.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved (EP071)		06-Oct-2017	12-Oct-2017	13-Oct-2017	✓	12-Oct-2017	21-Nov-2017	✓
WQA11_061017,	WQA13_061017,							
WQA14_061017,	SW1717_061017,							
SW1718_061017,	MW0221_061017,							
MW0220_061017,	MW1705_061017,							
MW1704_061017								
Amber VOC Vial - Sulfuric Acid (EP080)		06-Oct-2017	12-Oct-2017	20-Oct-2017	✓	12-Oct-2017	20-Oct-2017	✓
WQA11_061017,	WQA13_061017,							
WQA14_061017,	WQA15_061017,							
SW1717_061017,	SW1718_061017,							
MW0221_061017,	MW0220_061017,							
MW1705_061017,	MW1704_061017							



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Amber Glass Bottle - Unpreserved (EP071)								
WQA11_061017, WQA14_061017, SW1718_061017, MW0220_061017, MW1704_061017	WQA13_061017, SW1717_061017, MW0221_061017, MW1705_061017,	06-Oct-2017	12-Oct-2017	13-Oct-2017	✓	12-Oct-2017	21-Nov-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080)								
WQA11_061017, WQA14_061017, SW1717_061017, MW0221_061017, MW1705_061017,	WQA13_061017, WQA15_061017, SW1718_061017, MW0220_061017, MW1704_061017	06-Oct-2017	12-Oct-2017	20-Oct-2017	✓	12-Oct-2017	20-Oct-2017	✓
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080)								
WQA11_061017, WQA14_061017, SW1717_061017, MW0221_061017, MW1705_061017,	WQA13_061017, WQA15_061017, SW1718_061017, MW0220_061017, MW1704_061017	06-Oct-2017	12-Oct-2017	20-Oct-2017	✓	12-Oct-2017	20-Oct-2017	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
WQA11_061017, SW1718_061017, MW0220_061017, MW1704_061017	SW1717_061017, MW0221_061017, MW1705_061017,	06-Oct-2017	----	----	----	13-Oct-2017	04-Apr-2018	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
WQA11_061017, SW1718_061017, MW0220_061017, MW1704_061017	SW1717_061017, MW0221_061017, MW1705_061017,	06-Oct-2017	----	----	----	13-Oct-2017	04-Apr-2018	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
WQA11_061017, SW1718_061017, MW0220_061017, MW1704_061017	SW1717_061017, MW0221_061017, MW1705_061017,	06-Oct-2017	----	----	----	13-Oct-2017	04-Apr-2018	✓

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
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)		06-Oct-2017	----	----	----	13-Oct-2017	04-Apr-2018	✓
WQA11_061017,	SW1717_061017,							
SW1718_061017,	MW0221_061017,							
MW0220_061017,	MW1705_061017,							
MW1704_061017								
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)		06-Oct-2017	----	----	----	13-Oct-2017	04-Apr-2018	✓
WQA11_061017,	SW1717_061017,							
SW1718_061017,	MW0221_061017,							
MW0220_061017,	MW1705_061017,							
MW1704_061017								



Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Regular	Actual	Expected		Evaluation
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In house: Direct injection analysis of fresh waters after dilution (1:1) with methanol. Analysis by LC-Electrospray-MS-MS, 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. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.
Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

CERTIFICATE OF ANALYSIS

Work Order : **EP17111196**
Client : **AECOM Australia Pty Ltd**
Contact : [REDACTED]
Address : LEVEL 6 3 FORREST PLACE
 PERTH WA, AUSTRALIA 6849
Telephone : +61 02 8934 0000
Project : 60543717.1.3 Perth Airport Limited Site Investigation
Order number : 60543717.1.3
C-O-C number : ----
Sampler : [REDACTED]
Site : Perth Aiport
Quote number : EN/004/16
No. of samples received : 10
No. of samples analysed : 10

Page : 1 of 9
Laboratory : Environmental Division Perth
Contact : [REDACTED]
Address : 10 Hod Way Malaga WA Australia 6090
Telephone : +61-8-9209 7655
Date Samples Received : 09-Oct-2017 17:25
Date Analysis Commenced : 12-Oct-2017
Issue Date : 18-Oct-2017 07:52



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
[REDACTED]	Organic Chemist	Sydney Organics, Smithfield, NSW
[REDACTED]	Graduate Chemist	Perth Organics, Malaga, WA
[REDACTED]	Organic Chemist	Perth Organics, Malaga, WA



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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	MW37_091017	WQA16_091017	WQA18_091017	WQA19_091017	MW29_091017
Client sampling date / time					[09-Oct-2017]	[09-Oct-2017]	[09-Oct-2017]	[09-Oct-2017]	[09-Oct-2017]
Compound	CAS Number	LOR	Unit		EP1711196-001	EP1711196-002	EP1711196-003	EP1711196-004	EP1711196-005
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	<100
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	0.11
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.02	<0.02	----	----	0.29
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		0.33	0.34	----	----	3.99
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.02	<0.02	----	----	0.32
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.21	0.18	----	----	44.9

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	MW37_091017	WQA16_091017	WQA18_091017	WQA19_091017	MW29_091017
Client sampling date / time				[09-Oct-2017]	[09-Oct-2017]	[09-Oct-2017]	[09-Oct-2017]	[09-Oct-2017]	
Compound	CAS Number	LOR	Unit	EP1711196-001	EP1711196-002	EP1711196-003	EP1711196-004	EP1711196-005	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	----	----	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	----	----	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	----	----	0.52	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.06	0.05	----	----	0.68	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	----	----	0.12	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.04	0.04	----	----	0.60	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	----	----	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	----	----	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	----	----	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	----	----	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	----	----	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	----	----	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	----	----	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	----	----	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	----	----	<0.05	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	----	----	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	----	----	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	----	----	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	----	----	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Client sample ID

				MW37_091017	WQA16_091017	WQA18_091017	WQA19_091017	MW29_091017
Client sampling date / time				[09-Oct-2017]	[09-Oct-2017]	[09-Oct-2017]	[09-Oct-2017]	[09-Oct-2017]
Compound	CAS Number	LOR	Unit	EP1711196-001	EP1711196-002	EP1711196-003	EP1711196-004	EP1711196-005
				Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	----	----	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	----	----	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	----	----	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	----	----	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	0.68	0.61	----	----	51.5
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.54	0.52	----	----	48.9
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.64	0.61	----	----	50.9
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	2	%	108	108	101	104	114
Toluene-D8	2037-26-5	2	%	103	102	102	104	103
4-Bromofluorobenzene	460-00-4	2	%	104	88.3	112	104	118
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	113	117	----	----	116



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				WQA20_091017	MW34_091017	MW35_091017	MW22_091017	MW28_091017
Client sampling date / time				[09-Oct-2017]	[09-Oct-2017]	[09-Oct-2017]	[09-Oct-2017]	[09-Oct-2017]
Compound	CAS Number	LOR	Unit	EP1711196-006	EP1711196-007	EP1711196-008	EP1711196-009	EP1711196-010
				Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	----	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	----	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	----	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	----	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	----	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	----	<100	<100	100	<100
>C34 - C40 Fraction	----	100	µg/L	----	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	----	<100	<100	100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	----	<100	<100	<100	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	----	0.56	0.97	0.90	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	----	0.59	1.28	1.27	0.06
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	----	4.54	11.1	13.5	1.31
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	----	0.28	0.90	0.88	0.10
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	----	12.8	60.8	43.6	8.54

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQA20_091017	MW34_091017	MW35_091017	MW22_091017	MW28_091017
Client sampling date / time				[09-Oct-2017]	[09-Oct-2017]	[09-Oct-2017]	[09-Oct-2017]	[09-Oct-2017]	
Compound	CAS Number	LOR	Unit	EP1711196-006	EP1711196-007	EP1711196-008	EP1711196-009	EP1711196-010	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	----	<0.02	<0.02	<0.02	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	----	0.27	0.54	0.76	0.03	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	----	1.06	2.52	2.37	0.13	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	----	0.14	0.35	0.48	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	----	0.28	1.17	0.88	0.06	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	----	<0.02	<0.02	0.04	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	----	<0.02	<0.02	0.03	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	----	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	----	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	----	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	----	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	----	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	----	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	----	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	----	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	----	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	----	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	----	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Client sample ID

				WQA20_091017	MW34_091017	MW35_091017	MW22_091017	MW28_091017
Client sampling date / time				[09-Oct-2017]	[09-Oct-2017]	[09-Oct-2017]	[09-Oct-2017]	[09-Oct-2017]
Compound	CAS Number	LOR	Unit	EP1711196-006	EP1711196-007	EP1711196-008	EP1711196-009	EP1711196-010
				Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	----	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	----	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	----	<0.05	<0.05	0.15	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	----	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	----	20.5	79.6	64.9	10.2
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	----	17.3	71.9	57.1	9.85
Sum of PFAS (WA DER List)	----	0.01	µg/L	----	19.6	77.4	62.6	10.1
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	2	%	104	131	114	113	119
Toluene-D8	2037-26-5	2	%	104	101	101	99.5	99.4
4-Bromofluorobenzene	460-00-4	2	%	104	106	90.4	99.1	109
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	----	108	106	106	110



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	61	141
Toluene-D8	2037-26-5	73	126
4-Bromofluorobenzene	460-00-4	60	125
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	130

QUALITY CONTROL REPORT

Work Order	: EP17111196	Page	: 1 of 9
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Perth
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: LEVEL 6 3 FORREST PLACE PERTH WA, AUSTRALIA 6849	Address	: 10 Hod Way Malaga WA Australia 6090
Telephone	: +61 02 8934 0000	Telephone	: +61-8-9209 7655
Project	: 60543717.1.3 Perth Airport Limited Site Investigation	Date Samples Received	: 09-Oct-2017
Order number	: 60543717.1.3	Date Analysis Commenced	: 12-Oct-2017
C-O-C number	: ----	Issue Date	: 18-Oct-2017
Sampler	: [REDACTED]		
Site	: Perth Airport		
Quote number	: EN/004/16		
No. of samples received	: 10		
No. of samples analysed	: 10		



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
[REDACTED]	Organic Chemist	Sydney Organics, Smithfield, NSW
[REDACTED]	Graduate Chemist	Perth Organics, Malaga, WA
[REDACTED]	Organic Chemist	Perth Organics, Malaga, WA



General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1165159)									
EP1711196-001	MW37_091017	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EP1711196-009	MW22_091017	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1170475)									
EP1711191-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	780	800	1.65	0% - 20%
EP1711196-009	MW22_091017	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1165159)									
EP1711196-001	MW37_091017	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP1711196-009	MW22_091017	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1170475)									
EP1711191-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	500	490	0.00	0% - 20%
EP1711196-009	MW22_091017	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 1170475)									
EP1711191-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	10	9	13.3	0% - 50%
		EP080: Toluene	108-88-3	2	µg/L	43	40	7.89	0% - 20%
		EP080: Ethylbenzene	100-41-4	2	µg/L	7	6	0.00	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 1170475) - continued									
EP1711191-001	Anonymous	EP080: meta- & para-Xylene	108-38-3	2	µg/L	27	24	9.36	0% - 50%
		106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	16	15	8.75	No Limit
EP1711196-009	MW22_091017	EP080: Naphthalene	91-20-3	5	µg/L	6	6	0.00	No Limit
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.00	No Limit
		106-42-3							
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1169075)	MW37_091017	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.21	0.21	0.00	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.02	0.03	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.33	0.35	4.40	0% - 50%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.02	0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
ES1725386-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1169075)							
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.04	0.04	0.00	No Limit
EP1711196-001	MW37_091017	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.06	0.05	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
ES1725386-003	Anonymous	EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1169075) - continued									
ES1725386-003	Anonymous	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1169075)									
EP1711196-001	MW37_091017	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ES1725386-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1169075)									
EP1711196-001	MW37_091017	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit

Page : 5 of 9
 Work Order : EP1711196
 Client : AECOM Australia Pty Ltd
 Project : 60543717.1.3 Perth Airport Limited Site Investigation



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1169075) - continued									
EP1711196-001	MW37_091017	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ES1725386-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 1169075)									
EP1711196-001	MW37_091017	EP231X: Sum of PFAS	----	0.01	µg/L	0.68	0.70	2.90	0% - 20%
ES1725386-003	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.00	No Limit



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

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1165159)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	385 µg/L	74.2	35	95
EP071: C15 - C28 Fraction	----	100	µg/L	<100	385 µg/L	78.7	34	111
EP071: C29 - C36 Fraction	----	50	µg/L	<50	398 µg/L	75.6	34	105
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1170475)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	320 µg/L	109	74	113
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1165159)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	380 µg/L	77.7	37	99
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	597 µg/L	75.2	35	108
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	168 µg/L	102	11	117
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1170475)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	370 µg/L	111	74	115
EP080: BTEXN (QCLot: 1170475)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	111	84	114
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	95.5	81	115
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	110	84	113
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	112	84	114
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	110	87	111
EP080: Naphthalene	91-20-3	5	µg/L	<5	20 µg/L	109	77	118
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1169075)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.5 µg/L	121	70	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.5 µg/L	115	70	130
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.5 µg/L	124	70	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.5 µg/L	124	70	130
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.5 µg/L	119	70	130
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.5 µg/L	118	70	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1169075)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	2.5 µg/L	108	70	130
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.5 µg/L	126	70	130
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.5 µg/L	124	70	130
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.5 µg/L	120	70	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.5 µg/L	121	70	130
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.5 µg/L	120	70	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.5 µg/L	120	70	130



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1169075) - continued								
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.5 µg/L	128	70	130
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.5 µg/L	109	70	130
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.5 µg/L	73.6	70	130
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	1.25 µg/L	112	70	150
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1169075)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.5 µg/L	120	70	130
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	1.25 µg/L	124	70	150
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	1.25 µg/L	115	70	150
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	1.25 µg/L	125	70	150
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	1.25 µg/L	84.2	70	150
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.5 µg/L	122	70	130
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.5 µg/L	107	70	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1169075)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.5 µg/L	125	70	130
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.5 µg/L	117	70	130
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.5 µg/L	120	70	130
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.5 µg/L	91.4	70	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: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1165159)							
EP1711196-007	MW34_091017	EP071: C10 - C14 Fraction	----	385 µg/L	70.6	45	122
		EP071: C15 - C28 Fraction	----	385 µg/L	71.3	55	143
		EP071: C29 - C36 Fraction	----	398 µg/L	73.5	54	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1170475)							
EP1711191-002	Anonymous	EP080: C6 - C9 Fraction	----	240 µg/L	109	77	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1165159)							
EP1711196-007	MW34_091017	EP071: >C10 - C16 Fraction	----	380 µg/L	74.0	45	122
		EP071: >C16 - C34 Fraction	----	597 µg/L	69.6	55	143



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1165159) - continued							
EP1711196-007	MW34_091017	EP071: >C34 - C40 Fraction	----	168 µg/L	103	54	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1170475)							
EP1711191-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	290 µg/L	112	77	137
EP080: BTEXN (QCLot: 1170475)							
EP1711191-002	Anonymous	EP080: Benzene	71-43-2	20 µg/L	77.2	77	122
		EP080: Toluene	108-88-3	20 µg/L	101	74	126
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1169075)							
EP1711196-001	MW37_091017	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.5 µg/L	102	50	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.5 µg/L	119	50	130
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.5 µg/L	110	50	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.5 µg/L	123	50	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.5 µg/L	119	50	130
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.5 µg/L	115	50	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1169075)							
EP1711196-001	MW37_091017	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	2.5 µg/L	59.3	50	130
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.5 µg/L	110	50	130
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.5 µg/L	113	50	130
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.5 µg/L	116	50	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.5 µg/L	115	50	130
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.5 µg/L	123	50	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.5 µg/L	114	50	130
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.5 µg/L	129	50	130
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.5 µg/L	102	50	130
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.5 µg/L	58.8	50	130
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	1.25 µg/L	114	50	150
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1169075)							
EP1711196-001	MW37_091017	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.5 µg/L	120	50	130
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	1.25 µg/L	124	50	150
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	1.25 µg/L	119	50	150
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	1.25 µg/L	124	50	150
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	1.25 µg/L	120	50	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.5 µg/L	129	50	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.5 µg/L	101	50	130



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1169075)							
EP1711196-001	MW37_091017	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.5 µg/L	121	50	130
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.5 µg/L	120	50	130
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.5 µg/L	121	50	130
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.5 µg/L	78.6	50	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EP1711196	Page	: 1 of 5
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Perth
Contact	: [REDACTED]	Telephone	: +61-8-9209 7655
Project	: 60543717.1.3 Perth Airport Limited Site Investigation	Date Samples Received	: 09-Oct-2017
Site	: Perth Airport	Issue Date	: 18-Oct-2017
Sampler	: [REDACTED]	No. of samples received	: 10
Order number	: 60543717.1.3	No. of samples analysed	: 10

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.

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.

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.

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	
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved (EP071)								
MW37_091017, WQA18_091017, MW29_091017, MW35_091017, MW28_091017	WQA16_091017, WQA19_091017, MW34_091017, MW22_091017,	09-Oct-2017	12-Oct-2017	16-Oct-2017	✓	13-Oct-2017	21-Nov-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080)								
MW37_091017, WQA18_091017, MW29_091017, MW34_091017, MW22_091017,	WQA16_091017, WQA19_091017, WQA20_091017, MW35_091017, MW28_091017	09-Oct-2017	13-Oct-2017	23-Oct-2017	✓	13-Oct-2017	23-Oct-2017	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Amber Glass Bottle - Unpreserved (EP071)								
MW37_091017, WQA18_091017, MW29_091017, MW35_091017, MW28_091017	WQA16_091017, WQA19_091017, MW34_091017, MW22_091017,	09-Oct-2017	12-Oct-2017	16-Oct-2017	✓	13-Oct-2017	21-Nov-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080)								
MW37_091017, WQA18_091017, MW29_091017, MW34_091017, MW22_091017,	WQA16_091017, WQA19_091017, WQA20_091017, MW35_091017, MW28_091017	09-Oct-2017	13-Oct-2017	23-Oct-2017	✓	13-Oct-2017	23-Oct-2017	✓
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080)								
MW37_091017, WQA18_091017, MW29_091017, MW34_091017, MW22_091017,	WQA16_091017, WQA19_091017, WQA20_091017, MW35_091017, MW28_091017	09-Oct-2017	13-Oct-2017	23-Oct-2017	✓	13-Oct-2017	23-Oct-2017	✓



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X) MW37_091017, WQA16_091017, MW29_091017, MW34_091017, MW35_091017, MW22_091017, MW28_091017	09-Oct-2017	----	----	----	16-Oct-2017	07-Apr-2018	✓	
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X) MW37_091017, WQA16_091017, MW29_091017, MW34_091017, MW35_091017, MW22_091017, MW28_091017	09-Oct-2017	----	----	----	16-Oct-2017	07-Apr-2018	✓	
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X) MW37_091017, WQA16_091017, MW29_091017, MW34_091017, MW35_091017, MW22_091017, MW28_091017	09-Oct-2017	----	----	----	16-Oct-2017	07-Apr-2018	✓	
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X) MW37_091017, WQA16_091017, MW29_091017, MW34_091017, MW35_091017, MW22_091017, MW28_091017	09-Oct-2017	----	----	----	16-Oct-2017	07-Apr-2018	✓	
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X) MW37_091017, WQA16_091017, MW29_091017, MW34_091017, MW35_091017, MW22_091017, MW28_091017	09-Oct-2017	----	----	----	16-Oct-2017	07-Apr-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: **WATER**

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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In house: Direct injection analysis of fresh waters after dilution (1:1) with methanol. Analysis by LC-Electrospray-MS-MS, 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. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.
Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP1711196**

Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Perth
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: LEVEL 6 3 FORREST PLACE PERTH WA, AUSTRALIA 6849	Address	: 10 Hod Way Malaga WA Australia 6090
E-mail	: [REDACTED]	E-mail	: [REDACTED]
Telephone	: +61 02 8934 0000	Telephone	: +61-8-9209 7655
Facsimile	: +61 02 8934 0001	Facsimile	: +61-8-9209 7600
Project	: 60543717.1.3 Perth Airport Limited Site Investigation	Page	: 1 of 3
Order number	: 60543717.1.3	Quote number	: EB2015AECOMAU0580 (EN/004/16)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Perth Aiport		
Sampler	: [REDACTED]		

Dates

Date Samples Received	: 09-Oct-2017 17:25	Issue Date	: 10-Oct-2017
Client Requested Due Date	: 17-Oct-2017	Scheduled Reporting Date	: 17-Oct-2017

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 14.7 - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (SamplesPerth@alsenviro.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**



Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

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

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

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - W-04 TRH/BTEXN	WATER - W-18 TRH(C6 - C9)/BTEXN
EP1711196-001	[09-Oct-2017]	MW37_091017	✓	✓	
EP1711196-002	[09-Oct-2017]	WQA16_091017	✓	✓	
EP1711196-003	[09-Oct-2017]	WQA18_091017		✓	
EP1711196-004	[09-Oct-2017]	WQA19_091017		✓	
EP1711196-005	[09-Oct-2017]	MW29_091017	✓	✓	
EP1711196-006	[09-Oct-2017]	WQA20_091017			✓
EP1711196-007	[09-Oct-2017]	MW34_091017	✓	✓	
EP1711196-008	[09-Oct-2017]	MW35_091017	✓	✓	
EP1711196-009	[09-Oct-2017]	MW22_091017	✓	✓	
EP1711196-010	[09-Oct-2017]	MW28_091017	✓	✓	

Proactive Holding Time Report

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



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email



- Chain of Custody (CoC) (COC)

Email



- *AU Certificate of Analysis - NATA (COA)

Email



- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)

Email



- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)

Email



- A4 - AU Sample Receipt Notification - Environmental HT (SRN)

Email



- Chain of Custody (CoC) (COC)

Email



- EDI Format - ENMRG (ENMRG)

Email



- EDI Format - EQUIS V5 URS (EQUIS_V5_AECOM)

Email



- EDI Format - ESDAT (ESDAT)

Email



- EDI Format - XTab (XTAB)

Email



- Electronic SRN for EQUIS (ESRN_EQUIS)

Email



- *AU Certificate of Analysis - NATA (COA)

Email



- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)

Email



- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)

Email



- A4 - AU Sample Receipt Notification - Environmental HT (SRN)

Email



- Chain of Custody (CoC) (COC)

Email



- EDI Format - ENMRG (ENMRG)

Email



- EDI Format - EQUIS V5 URS (EQUIS_V5_AECOM)

Email



- EDI Format - ESDAT (ESDAT)

Email



- EDI Format - XTab (XTAB)

Email



- Electronic SRN for EQUIS (ESRN_EQUIS)

Email



- *AU Certificate of Analysis - NATA (COA)

Email



- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)

Email



- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)

Email



- A4 - AU Sample Receipt Notification - Environmental HT (SRN)

Email



- Chain of Custody (CoC) (COC)

Email



- EDI Format - ENMRG (ENMRG)

Email



- EDI Format - EQUIS V5 URS (EQUIS_V5_AECOM)

Email



- EDI Format - ESDAT (ESDAT)

Email



- EDI Format - XTab (XTAB)

Email



- Electronic SRN for EQUIS (ESRN_EQUIS)

Email



Certificate of Analysis

AECOM Aust Pty Ltd Perth
Level 4, 3 Forrest Place
Perth
WA 6000



NATA Accredited
Accreditation Number 1261
Site Number 23736

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:



Report 562900-W
Project name ASA LS1
Project ID 60543717
Received Date Sep 12, 2017

Client Sample ID			WQA02_120917
Sample Matrix			Water
Eurofins mgt Sample No.			P17-Se14028
Date Sampled			Sep 12, 2017
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	96
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.01	mg/L	< 0.01
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001
Indeno(1,2,3-cd)pyrene	0.001	mg/L	< 0.001
Naphthalene	0.001	mg/L	< 0.001
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001

Client Sample ID			WQA02_120917
Sample Matrix			Water
Eurofins mgt Sample No.			P17-Se14028
Date Sampled			Sep 12, 2017
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Total PAH*	0.001	mg/L	< 0.001
2-Fluorobiphenyl (surr.)	1	%	60
p-Terphenyl-d14 (surr.)	1	%	69
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA) ^{N11}	0.05	ug/L	< 0.05
Perfluoropentanoic acid (PFPeA) ^{N11}	0.01	ug/L	^{N09} 0.07
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	^{N09} 0.23
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	^{N09} 0.04
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	^{N09} 0.09
Perfluorononanoic acid (PFNA) ^{N11}	0.01	ug/L	< 0.01
Perfluorodecanoic acid (PFDA) ^{N11}	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnA) ^{N11}	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoA) ^{N11}	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTeDA)	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.01	ug/L	< 0.01
13C4-PFBA (surr.)	1	%	68
13C5-PFPeA (surr.)	1	%	78
13C5-PFHxA (surr.)	1	%	79
13C4-PFHpA (surr.)	1	%	78
13C8-PFOA (surr.)	1	%	72
13C5-PFNA (surr.)	1	%	75
13C6-PFDA (surr.)	1	%	53
13C2-PFUnDA (surr.)	1	%	35
13C2-PFDoDA (surr.)	1	%	26
13C2-PFTeDA (surr.)	1	%	11
Perfluoroalkane sulfonamides (PFASAs)			
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	38
D3-N-MeFOSA (surr.)	1	%	31
D5-N-EtFOSA (surr.)	1	%	20
D7-N-MeFOSE (surr.)	1	%	24
D9-N-EtFOSE (surr.)	1	%	19
D5-N-EtFOSAA (surr.)	1	%	50
D3-N-MeFOSAA (surr.)	1	%	49

Client Sample ID			WQA02_120917
Sample Matrix			Water
Eurofins mgt Sample No.			P17-Se14028
Date Sampled			Sep 12, 2017
Test/Reference	LOR	Unit	
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFASs)			
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	0.08
Perfluoropentanesulfonic acid (PFPeS)	0.01	ug/L	^{N09} 0.11
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.01	ug/L	^{N09} 1.5
Perfluoroheptanesulfonic acid (PFHpS)	0.01	ug/L	^{N09} 0.07
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	^{N09} 4.8
Perfluorodecanesulfonic acid (PFDS)	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	83
18O2-PFHxS (surr.)	1	%	76
13C8-PFOS (surr.)	1	%	69
n:2 Fluorotelomer sulfonic acids			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS) ^{N11}	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS) ^{N11}	0.05	ug/L	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS) ^{N11}	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	0.01	ug/L	< 0.01
13C2-4:2 FTS (surr.)	1	%	59
13C2-6:2 FTS (surr.)	1	%	58
13C2-8:2 FTS (surr.)	1	%	45
PFASs Summations			
Sum (PFHxS + PFOS)	0.01	ug/L	6.3
Sum of US EPA PFAS (PFOS + PFOA)	0.01	ug/L	4.89
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	0.01	ug/L	6.39
Sum of WA DER PFAS (n=10)	0.05	ug/L	6.81
Sum of PFASs (n=28)	0.1	ug/L	6.99

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C36	Melbourne	Sep 15, 2017	7 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Sep 13, 2017	7 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Sep 15, 2017	7 Day
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Sep 13, 2017	14 Day
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Water by GCMS	Melbourne	Sep 15, 2017	7 Day
Per- and Polyfluorinated Alkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Sep 14, 2017	14 Day
Perfluoroalkane sulfonamides (PFASAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Sep 14, 2017	14 Day
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Sep 14, 2017	14 Day
n:2 Fluorotelomer sulfonic acids - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Sep 14, 2017	14 Day

Company Name: AECOM Aust Pty Ltd Perth
Address: Level 4, 3 Forrest Place
Perth
WA 6000
Project Name: ASA LS1
Project ID: 60543717

Order No.: 60543717
Report #: 562900
Phone: 08 6208 0000
Fax:

Received: Sep 12, 2017 4:05 PM
Due: Sep 19, 2017
Priority: 5 Day
Contact Name: [REDACTED]

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail						Polycyclic Aromatic Hydrocarbons	BTEX	Moisture Set	Total Recoverable Hydrocarbons	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794										X
Perth Laboratory - NATA Site # 23736										
External Laboratory										
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID					
1	WQA02_120917	Sep 12, 2017		Water	P17-Se14028	X	X		X	X
2	SQA02_120917	Sep 12, 2017		Soil	P17-Se14029	X	X	X	X	X
3	SQA05_120917	Sep 12, 2017		Soil	P17-Se14030	X	X	X	X	X
Test Counts						3	3	2	3	3

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 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 Sample Receipt Advice.

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

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

****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							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
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 (PFUnA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoA)	ug/L	< 0.01			0.01	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkane sulfonamides (PFASAs)							
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							
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (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							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	82			70-130	Pass	
TRH C10-C14	%	104			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	98			70-130	Pass	
Toluene	%	93			70-130	Pass	
Ethylbenzene	%	74			70-130	Pass	
m&p-Xylenes	%	75			70-130	Pass	
Xylenes - Total	%	76			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	106			70-130	Pass	
TRH C6-C10	%	83			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	78			70-130	Pass	
Acenaphthylene	%	77			70-130	Pass	
Anthracene	%	82			70-130	Pass	
Benz(a)anthracene	%	75			70-130	Pass	
Benzo(a)pyrene	%	77			70-130	Pass	
Benzo(b&j)fluoranthene	%	76			70-130	Pass	
Benzo(g,h,i)perylene	%	84			70-130	Pass	
Benzo(k)fluoranthene	%	84			70-130	Pass	
Chrysene	%	82			70-130	Pass	
Dibenz(a,h)anthracene	%	86			70-130	Pass	
Fluoranthene	%	78			70-130	Pass	
Fluorene	%	78			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Indeno(1.2.3-cd)pyrene			%	84			70-130	Pass	
Naphthalene			%	79			70-130	Pass	
Phenanthrene			%	90			70-130	Pass	
Pyrene			%	72			70-130	Pass	
LCS - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions									
TRH >C10-C16		%	110				70-130	Pass	
LCS - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)									
Perfluorobutanoic acid (PFBA)		%	109				50-150	Pass	
Perfluoropentanoic acid (PFPeA)		%	98				50-150	Pass	
Perfluorohexanoic acid (PFHxA)		%	106				50-150	Pass	
Perfluoroheptanoic acid (PFHpA)		%	106				50-150	Pass	
Perfluorooctanoic acid (PFOA)		%	107				50-150	Pass	
Perfluorononanoic acid (PFNA)		%	111				50-150	Pass	
Perfluorodecanoic acid (PFDA)		%	114				50-150	Pass	
Perfluoroundecanoic acid (PFUnA)		%	109				50-150	Pass	
Perfluorododecanoic acid (PFDoA)		%	114				50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)		%	67				50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)		%	117				50-150	Pass	
LCS - % Recovery									
Perfluoroalkane sulfonamides (PFASAs)									
Perfluorooctane sulfonamide (FOSA)		%	102				50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)		%	109				50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)		%	85				50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)		%	97				50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)		%	110				50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)		%	106				50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)		%	96				50-150	Pass	
LCS - % Recovery									
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)									
Perfluorobutanesulfonic acid (PFBS)		%	109				50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)		%	115				50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)		%	109				50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)		%	116				50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)		%	107				50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)		%	51				50-150	Pass	
LCS - % Recovery									
n:2 Fluorotelomer sulfonic acids									
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)		%	112				50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)		%	107				50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)		%	88				50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)		%	54				50-150	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		A17-Se12001	NCP	%	95		70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene		M17-Se12216	NCP	%	79		70-130	Pass	
Acenaphthylene		M17-Se12216	NCP	%	87		70-130	Pass	
Anthracene		M17-Se12216	NCP	%	96		70-130	Pass	
Benz(a)anthracene		M17-Se12216	NCP	%	112		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Benzo(a)pyrene	M17-Se12216	NCP	%	112		70-130	Pass	
Benzo(b&j)fluoranthene	M17-Se12216	NCP	%	104		70-130	Pass	
Benzo(g,h,i)perylene	M17-Se12216	NCP	%	114		70-130	Pass	
Benzo(k)fluoranthene	M17-Se12216	NCP	%	122		70-130	Pass	
Chrysene	M17-Se12216	NCP	%	113		70-130	Pass	
Dibenz(a,h)anthracene	M17-Se12216	NCP	%	114		70-130	Pass	
Fluoranthene	M17-Se12216	NCP	%	110		70-130	Pass	
Fluorene	M17-Se12216	NCP	%	85		70-130	Pass	
Indeno(1,2,3-cd)pyrene	M17-Se12216	NCP	%	113		70-130	Pass	
Naphthalene	M17-Se12216	NCP	%	101		70-130	Pass	
Phenanthrene	M17-Se12216	NCP	%	98		70-130	Pass	
Pyrene	M17-Se12216	NCP	%	101		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
TRH >C10-C16	A17-Se12001	NCP	%	102		70-130	Pass	
Spike - % Recovery								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1				
Perfluorobutanoic acid (PFBA)	M17-Se15418	NCP	%	110		50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M17-Se15418	NCP	%	99		50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M17-Se15418	NCP	%	108		50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M17-Se15418	NCP	%	108		50-150	Pass	
Perfluorooctanoic acid (PFOA)	M17-Se15418	NCP	%	108		50-150	Pass	
Perfluorononanoic acid (PFNA)	M17-Se15418	NCP	%	111		50-150	Pass	
Perfluorodecanoic acid (PFDA)	M17-Se15418	NCP	%	108		50-150	Pass	
Perfluoroundecanoic acid (PFUnA)	M17-Se15418	NCP	%	110		50-150	Pass	
Perfluorododecanoic acid (PFDoA)	M17-Se15418	NCP	%	115		50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M17-Se15418	NCP	%	93		50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M17-Se15418	NCP	%	125		50-150	Pass	
Spike - % Recovery								
Perfluoroalkane sulfonamides (PFASAs)				Result 1				
Perfluorooctane sulfonamide (FOSA)	M17-Se15418	NCP	%	106		50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M17-Se15418	NCP	%	110		50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M17-Se15418	NCP	%	80		50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M17-Se15418	NCP	%	109		50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M17-Se15418	NCP	%	118		50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M17-Se15418	NCP	%	111		50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M17-Se15418	NCP	%	107		50-150	Pass	
Spike - % Recovery								
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)				Result 1				
Perfluorobutanesulfonic acid (PFBS)	M17-Se15418	NCP	%	109		50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M17-Se15418	NCP	%	99		50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M17-Se15418	NCP	%	109		50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M17-Se15418	NCP	%	111		50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M17-Se15418	NCP	%	103		50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorodecanesulfonic acid (PFDS)	M17-Se15418	NCP	%	81			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	M17-Se15418	NCP	%	114			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	M17-Se15418	NCP	%	110			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	M17-Se15418	NCP	%	89			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	M17-Se15418	NCP	%	63			50-150	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	M17-Se18047	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M17-Se13558	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M17-Se13558	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M17-Se13558	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M17-Se18047	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M17-Se18047	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M17-Se18047	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M17-Se18047	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M17-Se18047	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M17-Se18047	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M17-Se18047	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M17-Se18047	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M17-Se13558	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M17-Se13558	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M17-Se13558	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M17-Se13558	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M17-Se13558	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M17-Se13558	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g,h,i)perylene	M17-Se13558	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M17-Se13558	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	M17-Se13558	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a,h)anthracene	M17-Se13558	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	M17-Se13558	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M17-Se13558	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	M17-Se13558	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	M17-Se13558	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	M17-Se13558	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	M17-Se13558	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M17-Se13558	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M17-Se13558	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M17-Se13558	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD		
Perfluorobutanoic acid (PFBA)	M17-Se15417	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Perfluoropentanoic acid (PFPeA)	M17-Se15417	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanoic acid (PFHxA)	M17-Se15417	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroheptanoic acid (PFHpA)	M17-Se15417	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanoic acid (PFOA)	M17-Se15417	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorononanoic acid (PFNA)	M17-Se15417	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorodecanoic acid (PFDA)	M17-Se15417	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroundecanoic acid (PFUnA)	M17-Se15417	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorododecanoic acid (PFDoA)	M17-Se15417	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotridecanoic acid (PFTTrDA)	M17-Se15417	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotetradecanoic acid (PFTeDA)	M17-Se15417	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
Perfluoroalkane sulfonamides (PFASAs)				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	M17-Se15417	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M17-Se15417	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M17-Se15417	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M17-Se15417	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M17-Se15417	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M17-Se15417	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M17-Se15417	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	M17-Se15417	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	M17-Se15417	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	M17-Se15417	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	M17-Se15417	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	M17-Se15417	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	M17-Se15417	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
n:2 Fluorotelomer sulfonic acids				Result 1	Result 2	RPD		
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	M17-Se15417	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	M17-Se15417	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	M17-Se15417	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	M17-Se15417	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass

Comments

Some surrogate recoveries were recorded in excess of the QC limit designated in QSM 5.1 of 50-150%. Since no positive results were reported for any PFAS compounds for any of the Samples in this case no data was affected.

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. 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

	Analytical Services Manager
	Senior Analyst-Organic (VIC)
	Senior Analyst-Volatile (VIC)
	Senior Analyst-Organic (QLD)
	Senior Analyst-Organic (VIC)



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](#).

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☐ Sydney Laboratory☐ Brisbane Laboratory☐ **Perth Laboratory**☐ Melbourne Laboratory

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

Page 1 of 1 QS3009_R6 Modified by: S. Kojima Approved by: Dr. R Symons Approved on: 2 November 2016

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

Sample Receipt Advice

Company name: **AECOM Aust Pty Ltd Perth**

Contact name: [REDACTED]

Project name: **ASA LS1**

Project ID: **60543717**

COC number: **Not provided**

Turn around time: **5 Day**

Date/Time received: **Sep 12, 2017 4:05 PM**

Eurofins | mgt reference: **562900**

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 : 18.8 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.
- ☒ 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:

[REDACTED] on Phone : or by e.mail: [REDACTED]

Results will be delivered electronically via e.mail to [REDACTED] - [REDACTED]

Company Name: AECOM Aust Pty Ltd Perth
Address: Level 4, 3 Forrest Place
Perth
WA 6000
Project Name: ASA LS1
Project ID: 60543717

Order No.: 60543717
Report #: 562900
Phone: 08 6208 0000
Fax:

Received: Sep 12, 2017 4:05 PM
Due: Sep 19, 2017
Priority: 5 Day
Contact Name: [REDACTED]

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail						Polycyclic Aromatic Hydrocarbons	BTEX	Moisture Set	Total Recoverable Hydrocarbons	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794										X
Perth Laboratory - NATA Site # 23736										
External Laboratory										
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID					
1	WQA02_120917	Sep 12, 2017		Water	P17-Se14028	X	X		X	X
2	SQA02_120917	Sep 12, 2017		Soil	P17-Se14029	X	X	X	X	X
3	SQA05_120917	Sep 12, 2017		Soil	P17-Se14030	X	X	X	X	X
Test Counts						3	3	2	3	3

Certificate of Analysis

AECOM Aust Pty Ltd Perth
Level 4, 3 Forrest Place
Perth
WA 6000



NATA Accredited
Accreditation Number 1261
Site Number 23736

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:

Report 562900-S
Project name ASA LS1
Project ID 60543717
Received Date Sep 12, 2017

Client Sample ID			SQA02_120917	SQA05_120917
Sample Matrix			Soil	Soil
Eurofins mgt Sample No.			P17-Se14029	P17-Se14030
Date Sampled			Sep 12, 2017	Sep 12, 2017
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
BTEX				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	104	114
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20
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

Client Sample ID			SQA02_120917	SQA05_120917
Sample Matrix			Soil	Soil
Eurofins mgt Sample No.			P17-Se14029	P17-Se14030
Date Sampled			Sep 12, 2017	Sep 12, 2017
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons				
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	%	94	82
p-Terphenyl-d14 (surr.)	1	%	105	93
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
TRH >C10-C16	50	mg/kg	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100
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 (PFUnA) ^{N11}	5	ug/kg	< 5	< 5
Perfluorododecanoic acid (PFDoA) ^{N11}	5	ug/kg	< 5	< 5
Perfluorotridecanoic acid (PFTeDA)	5	ug/kg	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	5	ug/kg	< 5	< 5
13C4-PFBA (surr.)	1	%	112	111
13C5-PFPeA (surr.)	1	%	85	90
13C5-PFHxA (surr.)	1	%	86	83
13C4-PFHpA (surr.)	1	%	87	88
13C8-PFOA (surr.)	1	%	81	84
13C5-PFNA (surr.)	1	%	82	83
13C6-PFDA (surr.)	1	%	95	99
13C2-PFUnDA (surr.)	1	%	106	112
13C2-PFDoDA (surr.)	1	%	104	108
13C2-PFTeDA (surr.)	1	%	75	77
Perfluoroalkane sulfonamides (PFASAs)				
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	%	74	82
D3-N-MeFOSA (surr.)	1	%	75	83
D5-N-EtFOSA (surr.)	1	%	110	121
D7-N-MeFOSE (surr.)	1	%	73	73
D9-N-EtFOSE (surr.)	1	%	71	80
D5-N-EtFOSAA (surr.)	1	%	82	87
D3-N-MeFOSAA (surr.)	1	%	109	128

Client Sample ID			SQA02_120917	SQA05_120917
Sample Matrix			Soil	Soil
Eurofins mgt Sample No.			P17-Se14029	P17-Se14030
Date Sampled			Sep 12, 2017	Sep 12, 2017
Test/Reference	LOR	Unit		
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFASs)				
Perfluorobutanesulfonic acid (PFBS) ^{N11}	5	ug/kg	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)	5	ug/kg	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	5	ug/kg	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)	5	ug/kg	< 5	< 5
Perfluorooctanesulfonic acid (PFOS) ^{N11}	5	ug/kg	^{N09} 15	< 5
Perfluorodecanesulfonic acid (PFDS)	5	ug/kg	< 5	< 5
13C3-PFBS (surr.)	1	%	92	93
18O2-PFHxS (surr.)	1	%	96	96
13C8-PFOS (surr.)	1	%	93	97
n:2 Fluorotelomer sulfonic acids				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS) ^{N11}	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS) ^{N11}	10	ug/kg	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS) ^{N11}	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	5	ug/kg	< 5	< 5
13C2-4:2 FTS (surr.)	1	%	69	71
13C2-6:2 FTS (surr.)	1	%	81	68
13C2-8:2 FTS (surr.)	1	%	81	73
PFASs Summations				
Sum (PFHxS + PFOS)	5	ug/kg	15	< 5
Sum of US EPA PFAS (PFOS + PFOA)	5	ug/kg	15	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	5	ug/kg	15	< 5
Sum of WA DER PFAS (n=10)	10	ug/kg	15	< 10
Sum of PFASs (n=28)	50	ug/kg	< 50	< 50
% Moisture	1	%	6.9	2.6

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C36	Melbourne	Sep 15, 2017	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Sep 15, 2017	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Sep 15, 2017	14 Day
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Sep 15, 2017	14 Day
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2140 PAH and Phenols in Soils by GCMS	Melbourne	Sep 15, 2017	14 Day
Per- and Polyfluorinated Alkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Sep 15, 2017	180 Day
Perfluoroalkane sulfonamides (PFASAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Sep 15, 2017	180 Day
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Sep 15, 2017	180 Day
n:2 Fluorotelomer sulfonic acids - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Sep 15, 2017	180 Day
% Moisture - Method: LTM-GEN-7080 Moisture	Melbourne	Sep 12, 2017	14 Day

Company Name: AECOM Aust Pty Ltd Perth
Address: Level 4, 3 Forrest Place
Perth
WA 6000
Project Name: ASA LS1
Project ID: 60543717

Order No.: 60543717
Report #: 562900
Phone: 08 6208 0000
Fax:

Received: Sep 12, 2017 4:05 PM
Due: Sep 19, 2017
Priority: 5 Day
Contact Name: [REDACTED]

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail						Polycyclic Aromatic Hydrocarbons	BTEX	Moisture Set	Total Recoverable Hydrocarbons	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794										X
Perth Laboratory - NATA Site # 23736										
External Laboratory										
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID					
1	WQA02_120917	Sep 12, 2017		Water	P17-Se14028	X	X		X	X
2	SQA02_120917	Sep 12, 2017		Soil	P17-Se14029	X	X	X	X	X
3	SQA05_120917	Sep 12, 2017		Soil	P17-Se14030	X	X	X	X	X
Test Counts						3	3	2	3	3

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 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 Sample Receipt Advice.

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

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

****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							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
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							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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							
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 (PFUnA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoA)	ug/kg	< 5			5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkane sulfonamides (PFASAs)							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
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							
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (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							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	121			70-130	Pass	
TRH C10-C14	%	82			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	110			70-130	Pass	
Toluene	%	112			70-130	Pass	
Ethylbenzene	%	109			70-130	Pass	
m&p-Xylenes	%	113			70-130	Pass	
Xylenes - Total	%	113			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	105			70-130	Pass	
TRH C6-C10	%	119			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	90			70-130	Pass	
Acenaphthylene	%	91			70-130	Pass	
Anthracene	%	80			70-130	Pass	
Benz(a)anthracene	%	114			70-130	Pass	
Benzo(a)pyrene	%	87			70-130	Pass	
Benzo(b&j)fluoranthene	%	88			70-130	Pass	
Benzo(g,h,i)perylene	%	74			70-130	Pass	
Benzo(k)fluoranthene	%	83			70-130	Pass	
Chrysene	%	120			70-130	Pass	
Dibenz(a,h)anthracene	%	75			70-130	Pass	
Fluoranthene	%	107			70-130	Pass	
Fluorene	%	89			70-130	Pass	

Test		Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
Indeno(1.2.3-cd)pyrene		%	73			70-130	Pass		
Naphthalene		%	88			70-130	Pass		
Phenanthrene		%	98			70-130	Pass		
Pyrene		%	104			70-130	Pass		
LCS - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions									
TRH >C10-C16	%	82				70-130	Pass		
LCS - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)									
Perfluorobutanoic acid (PFBA)	%	104				50-150	Pass		
Perfluoropentanoic acid (PFPeA)	%	117				50-150	Pass		
Perfluorohexanoic acid (PFHxA)	%	105				50-150	Pass		
Perfluoroheptanoic acid (PFHpA)	%	106				50-150	Pass		
Perfluorooctanoic acid (PFOA)	%	107				50-150	Pass		
Perfluorononanoic acid (PFNA)	%	108				50-150	Pass		
Perfluorodecanoic acid (PFDA)	%	112				50-150	Pass		
Perfluoroundecanoic acid (PFUnA)	%	97				50-150	Pass		
Perfluorododecanoic acid (PFDoA)	%	124				50-150	Pass		
Perfluorotridecanoic acid (PFTrDA)	%	100				50-150	Pass		
Perfluorotetradecanoic acid (PFTeDA)	%	121				50-150	Pass		
LCS - % Recovery									
Perfluoroalkane sulfonamides (PFASAs)									
Perfluorooctane sulfonamide (FOSA)	%	111				50-150	Pass		
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	104				50-150	Pass		
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	110				50-150	Pass		
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	80				50-150	Pass		
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	116				50-150	Pass		
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	100				50-150	Pass		
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	123				50-150	Pass		
LCS - % Recovery									
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAAs)									
Perfluorobutanesulfonic acid (PFBS)	%	97				50-150	Pass		
Perfluoropentanesulfonic acid (PFPeS)	%	111				50-150	Pass		
Perfluorohexanesulfonic acid (PFHxS)	%	110				50-150	Pass		
Perfluoroheptanesulfonic acid (PFHpS)	%	115				50-150	Pass		
Perfluorooctanesulfonic acid (PFOS)	%	101				50-150	Pass		
Perfluorodecanesulfonic acid (PFDS)	%	108				50-150	Pass		
LCS - % Recovery									
n:2 Fluorotelomer sulfonic acids									
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	%	97				50-150	Pass		
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	%	105				50-150	Pass		
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	%	134				50-150	Pass		
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	%	135				50-150	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	Z17-Se13049	NCP	%	95			70-130	Pass	
TRH C10-C14	P17-Se14209	NCP	%	73			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	Z17-Se13049	NCP	%	95			70-130	Pass	
Toluene	Z17-Se13049	NCP	%	101			70-130	Pass	
Ethylbenzene	Z17-Se13049	NCP	%	101			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
m&p-Xylenes	Z17-Se13049	NCP	%	105			70-130	Pass	
o-Xylene	Z17-Se13049	NCP	%	107			70-130	Pass	
Xylenes - Total	Z17-Se13049	NCP	%	105			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	Z17-Se13049	NCP	%	106			70-130	Pass	
TRH C6-C10	Z17-Se13049	NCP	%	89			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	P17-Se14144	NCP	%	100			70-130	Pass	
Acenaphthylene	P17-Se14144	NCP	%	93			70-130	Pass	
Anthracene	P17-Se14144	NCP	%	86			70-130	Pass	
Benz(a)anthracene	P17-Se14144	NCP	%	114			70-130	Pass	
Benzo(a)pyrene	P17-Se14144	NCP	%	94			70-130	Pass	
Benzo(b&j)fluoranthene	P17-Se14144	NCP	%	98			70-130	Pass	
Benzo(g,h,i)perylene	P17-Se14144	NCP	%	100			70-130	Pass	
Benzo(k)fluoranthene	P17-Se14144	NCP	%	84			70-130	Pass	
Chrysene	P17-Se14144	NCP	%	108			70-130	Pass	
Dibenz(a,h)anthracene	P17-Se14144	NCP	%	100			70-130	Pass	
Fluoranthene	P17-Se14144	NCP	%	116			70-130	Pass	
Fluorene	P17-Se14144	NCP	%	103			70-130	Pass	
Indeno(1,2,3-cd)pyrene	P17-Se14144	NCP	%	99			70-130	Pass	
Naphthalene	P17-Se14144	NCP	%	94			70-130	Pass	
Phenanthrene	P17-Se14144	NCP	%	102			70-130	Pass	
Pyrene	P17-Se14144	NCP	%	117			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	P17-Se14209	NCP	%	73			70-130	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	P17-Se14029	CP	%	101			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	P17-Se14029	CP	%	115			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	P17-Se14029	CP	%	107			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	P17-Se14029	CP	%	112			50-150	Pass	
Perfluorooctanoic acid (PFOA)	P17-Se14029	CP	%	108			50-150	Pass	
Perfluorononanoic acid (PFNA)	P17-Se14029	CP	%	113			50-150	Pass	
Perfluorodecanoic acid (PFDA)	P17-Se14029	CP	%	117			50-150	Pass	
Perfluoroundecanoic acid (PFUnA)	P17-Se14029	CP	%	89			50-150	Pass	
Perfluorododecanoic acid (PFDoA)	P17-Se14029	CP	%	130			50-150	Pass	
Perfluorotridecanoic acid (PFTTrDA)	P17-Se14029	CP	%	104			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	P17-Se14029	CP	%	123			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonamides (PFASAs)				Result 1					
Perfluorooctane sulfonamide (FOSA)	P17-Se14029	CP	%	122			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	P17-Se14029	CP	%	122			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	P17-Se14029	CP	%	123			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	P17-Se14029	CP	%	86			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	P17-Se14029	CP	%	110			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	P17-Se14029	CP	%	115			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	P17-Se14029	CP	%	115			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSA's)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	P17-Se14029	CP	%	100			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	P17-Se14029	CP	%	114			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	P17-Se14029	CP	%	118			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	P17-Se14029	CP	%	130			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	P17-Se14029	CP	%	87			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	P17-Se14029	CP	%	97			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	P17-Se14029	CP	%	99			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	P17-Se14029	CP	%	124			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	P17-Se14029	CP	%	132			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	P17-Se14029	CP	%	136			50-150	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	Z17-Se13048	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	P17-Se14208	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	P17-Se14208	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	P17-Se14208	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	Z17-Se13048	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	Z17-Se13048	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	Z17-Se13048	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	Z17-Se13048	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	Z17-Se13048	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	Z17-Se13048	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	Z17-Se13048	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	Z17-Se13048	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M17-Se15260	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M17-Se15260	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M17-Se15260	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M17-Se15260	NCP	mg/kg	1.0	0.6	55	30%	Fail	Q15
Benzo(a)pyrene	M17-Se15260	NCP	mg/kg	1.3	0.9	39	30%	Fail	Q15

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Benzo(b&j)fluoranthene	M17-Se15260	NCP	mg/kg	0.9	0.6	42	30%	Fail	Q15
Benzo(g,h,i)perylene	M17-Se15260	NCP	mg/kg	1.0	0.7	30	30%	Pass	
Benzo(k)fluoranthene	M17-Se15260	NCP	mg/kg	1.0	0.6	43	30%	Fail	Q15
Chrysene	M17-Se15260	NCP	mg/kg	1.2	0.7	50	30%	Fail	Q15
Dibenz(a,h)anthracene	M17-Se15260	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M17-Se15260	NCP	mg/kg	0.9	< 0.5	70	30%	Fail	Q15
Fluorene	M17-Se15260	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	M17-Se15260	NCP	mg/kg	0.8	0.6	26	30%	Pass	
Naphthalene	M17-Se15260	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M17-Se15260	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M17-Se15260	NCP	mg/kg	1.2	0.6	62	30%	Fail	Q15
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	P17-Se14208	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	P17-Se14208	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	P17-Se14208	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M17-Se09512	NCP	%	8.1	8.9	10	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnA)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoA)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTTrDA)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkane sulfonamides (PFASAs)				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	P17-Se14030	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	P17-Se14030	CP	ug/kg	< 10	< 10	<1	30%	Pass	

Duplicate								
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFASs)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass
Duplicate								
n:2 Fluorotelomer sulfonic acids				Result 1	Result 2	RPD		
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	P17-Se14030	CP	ug/kg	< 10	< 10	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	P17-Se14030	CP	ug/kg	< 5	< 5	<1	30%	Pass

Comments

Some surrogate recoveries were recorded in excess of the QC limit designated in QSM 5.1 of 50-150%. Since no positive results were reported for any PFAS compounds for any of the Samples in this case no data was affected.

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. 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).
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

	Analytical Services Manager
	Senior Analyst-Metal (VIC)
	Senior Analyst-Organic (VIC)
	Senior Analyst-Volatile (VIC)
	Senior Analyst-Inorganic (VIC)
	Senior Analyst-Organic (QLD)
	Senior Analyst-Organic (VIC)



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](#).

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Certificate of Analysis

AECOM Aust Pty Ltd Perth
Level 4, 3 Forrest Place
Perth
WA 6000



NATA Accredited
Accreditation Number 1261
Site Number 23736

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:

Report 564136-W
Project name PAPL LSI
Project ID 60543717
Received Date Sep 20, 2017

Client Sample ID			WQA04_200917
Sample Matrix			Water
Eurofins mgt Sample No.			P17-Se24042
Date Sampled			Sep 20, 2017
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	79
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.01	mg/L	< 0.01
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA) ^{N11}	0.05	ug/L	< 0.05
Perfluoropentanoic acid (PFPeA) ^{N11}	0.01	ug/L	< 0.01
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	^{N09} 0.02
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	< 0.01
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	^{N09} 0.01
Perfluorononanoic acid (PFNA) ^{N11}	0.01	ug/L	< 0.01
Perfluorodecanoic acid (PFDA) ^{N11}	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnA) ^{N11}	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoA) ^{N11}	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTTrDA)	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.01	ug/L	< 0.01

Client Sample ID			WQA04_200917
Sample Matrix			Water
Eurofins mgt Sample No.			P17-Se24042
Date Sampled			Sep 20, 2017
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
13C4-PFBA (surr.)	1	%	37
13C5-PFPeA (surr.)	1	%	59
13C5-PFHxA (surr.)	1	%	62
13C4-PFHpA (surr.)	1	%	66
13C8-PFOA (surr.)	1	%	65
13C5-PFNA (surr.)	1	%	59
13C6-PFDA (surr.)	1	%	43
13C2-PFUnDA (surr.)	1	%	31
13C2-PFDoDA (surr.)	1	%	22
13C2-PFTeDA (surr.)	1	%	10
Perfluoroalkane sulfonamides (PFASAs)			
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	35
D3-N-MeFOSA (surr.)	1	%	20
D5-N-EtFOSA (surr.)	1	%	15
D7-N-MeFOSE (surr.)	1	%	15
D9-N-EtFOSE (surr.)	1	%	13
D5-N-EtFOSAA (surr.)	1	%	39
D3-N-MeFOSAA (surr.)	1	%	40
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAAs)			
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	0.02
Perfluoropentanesulfonic acid (PFPeS)	0.01	ug/L	^{N09} 0.02
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.01	ug/L	^{N09} 0.17
Perfluoroheptanesulfonic acid (PFHpS)	0.01	ug/L	< 0.01
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	^{N09} 0.34
Perfluorodecanesulfonic acid (PFDS)	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	69
18O2-PFHxS (surr.)	1	%	67
13C8-PFOS (surr.)	1	%	49
n:2 Fluorotelomer sulfonic acids			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS) ^{N11}	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS) ^{N11}	0.05	ug/L	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS) ^{N11}	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	0.01	ug/L	< 0.01
13C2-4:2 FTS (surr.)	1	%	60
13C2-6:2 FTS (surr.)	1	%	65
13C2-8:2 FTS (surr.)	1	%	46

Client Sample ID			WQA04_200917
Sample Matrix			Water
Eurofins mgt Sample No.			P17-Se24042
Date Sampled			Sep 20, 2017
Test/Reference	LOR	Unit	
PFASs Summations			
Sum (PFHxS + PFOS)	0.01	ug/L	0.51
Sum of US EPA PFAS (PFOS + PFOA)	0.01	ug/L	0.35
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	0.01	ug/L	0.52
Sum of WA DER PFAS (n=10)	0.05	ug/L	0.56
Sum of PFASs (n=28)	0.1	ug/L	0.58

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C36	Melbourne	Sep 25, 2017	7 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Sep 21, 2017	7 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Sep 25, 2017	7 Day
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Sep 21, 2017	14 Day
Per- and Polyfluorinated Alkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Sep 25, 2017	14 Day
Perfluoroalkane sulfonamides (PFASAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Sep 25, 2017	14 Day
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Sep 25, 2017	14 Day
n:2 Fluorotelomer sulfonic acids - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Sep 25, 2017	14 Day

Company Name: AECOM Aust Pty Ltd Perth
Address: Level 4, 3 Forrest Place
Perth
WA 6000
Project Name: PAPL LSI
Project ID: 60543717

Order No.:
Report #: 564136
Phone: 08 6208 0000
Fax:

Received: Sep 20, 2017 4:24 PM
Due: Sep 28, 2017
Priority: 5 Day
Contact Name: [REDACTED]

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail						BTEX	Total Recoverable Hydrocarbons	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	WQA04_200917	Sep 20, 2017		Water	P17-Se24042	X	X	X
Test Counts						1	1	1

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 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 Sample Receipt Advice.

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

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

****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							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
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 (PFUnA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTriDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkane sulfonamides (PFASAs)							
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							
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFASs)							
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	83			70-130	Pass	
TRH C10-C14	%	95			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	91			70-130	Pass	
Toluene	%	90			70-130	Pass	
Ethylbenzene	%	70			70-130	Pass	
m&p-Xylenes	%	72			70-130	Pass	
Xylenes - Total	%	72			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH C6-C10	%	82			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	91			70-130	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	115			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	121			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	114			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	116			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	112			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	114			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	116			50-150	Pass	
Perfluoroundecanoic acid (PFUnA)	%	120			50-150	Pass	
Perfluorododecanoic acid (PFDoA)	%	113			50-150	Pass	
Perfluorotridecanoic acid (PFTriDA)	%	110			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	119			50-150	Pass	
LCS - % Recovery							
Perfluoroalkane sulfonamides (PFASAs)							
Perfluorooctane sulfonamide (FOSA)	%	107			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	97			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	108			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	110			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	113			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	118			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	112			50-150	Pass	
LCS - % Recovery							
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	113			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	125			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	114			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	115			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	87			50-150	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorodecanesulfonic acid (PFDS)			%	81			50-150	Pass	
LCS - % Recovery									
n:2 Fluorotelomer sulfonic acids									
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)			%	118			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)			%	119			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)			%	104			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)			%	105			50-150	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	M17-Se27212	NCP	%	123			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M17-Se27212	NCP	%	119			70-130	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M17-Se22431	NCP	%	99			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M17-Se22431	NCP	%	91			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M17-Se22431	NCP	%	95			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M17-Se22431	NCP	%	96			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M17-Se22431	NCP	%	96			50-150	Pass	
Perfluorononanoic acid (PFNA)	M17-Se22431	NCP	%	100			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M17-Se22431	NCP	%	95			50-150	Pass	
Perfluoroundecanoic acid (PFUnA)	M17-Se22431	NCP	%	88			50-150	Pass	
Perfluorododecanoic acid (PFDoA)	M17-Se22431	NCP	%	89			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M17-Se22431	NCP	%	61			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M17-Se22431	NCP	%	88			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonamides (PFASAs)				Result 1					
Perfluorooctane sulfonamide (FOSA)	M17-Se22431	NCP	%	86			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M17-Se22431	NCP	%	84			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M17-Se22431	NCP	%	75			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M17-Se22431	NCP	%	75			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M17-Se22431	NCP	%	81			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M17-Se22431	NCP	%	82			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M17-Se22431	NCP	%	83			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M17-Se22431	NCP	%	97			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M17-Se22431	NCP	%	110			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M17-Se22431	NCP	%	100			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M17-Se22431	NCP	%	112			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M17-Se22431	NCP	%	90			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorodecanesulfonic acid (PFDS)	M17-Se22431	NCP	%	55			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	M17-Se22431	NCP	%	99			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	M17-Se22431	NCP	%	101			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	M17-Se22431	NCP	%	84			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	M17-Se22431	NCP	%	67			50-150	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	M17-Se28745	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M17-Se26408	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M17-Se26408	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M17-Se26408	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M17-Se28745	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M17-Se28745	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M17-Se28745	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M17-Se28745	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M17-Se28745	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M17-Se28745	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M17-Se28745	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M17-Se28745	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M17-Se26408	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M17-Se26408	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M17-Se26408	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M17-Se22430	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M17-Se22430	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M17-Se22430	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M17-Se22430	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M17-Se22430	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M17-Se22430	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M17-Se22430	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnA)	M17-Se22430	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoA)	M17-Se22430	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M17-Se22430	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M17-Se22430	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate								
Perfluoroalkane sulfonamides (PFASAs)				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	M17-Se22430	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M17-Se22430	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M17-Se22430	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M17-Se22430	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M17-Se22430	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M17-Se22430	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M17-Se22430	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	M17-Se22430	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	M17-Se22430	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	M17-Se22430	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	M17-Se22430	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	M17-Se22430	NCP	ug/L	0.01	0.01	4.0	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	M17-Se22430	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
n:2 Fluorotelomer sulfonic acids				Result 1	Result 2	RPD		
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	M17-Se22430	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	M17-Se22430	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	M17-Se22430	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	M17-Se22430	NCP	ug/L	< 0.01	< 0.01	<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.
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. 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

	Analytical Services Manager
	Senior Analyst-Organic (VIC)
	Senior Analyst-Volatile (VIC)
	Senior Analyst-Organic (QLD)
	Senior Analyst-Organic (VIC)



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

CLIENT DETAILS

Contact Name:

Project Manager :

Email for results

Special Directions & Comments :

Eurofins | mgt DI water batch number:

Page of

Purchase Order :

GOC Number :

PROJECT Number: 6054371

Euroflins | mgt quote ID : URS Rates

PROJECT Name : PAPL LST

Data output format:

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

Sample comments:

1LP	250P	125P	1LA	40ml vial	125ml A	lar
-----	------	------	-----	-----------	---------	-----

Relinquished By:

Laboratory Staff

Received By:

Turn around time

Method Of Shipment

Temperature on arrival:

Date & Time:: 20/10/2023 22:30

Date & Time: 20/9/2012

1 DAY ☐ 2 DAY ☐ 3 DAY ☐

☐ Courier
☐ Hand Delivered
☐ Postal

Courier Consignment # :

Signature:

Signature: 126

5 DAY ☐ 10 DAY ☐ Other: _____

Report number:

564136

Sample Receipt Advice

Company name: **AECOM Aust Pty Ltd Perth**

Contact name: [REDACTED]

Project name: **PAPL LSI**

Project ID: **60543717**

COC number: **Not provided**

Turn around time: **5 Day**

Date/Time received: **Sep 20, 2017 4:24 PM**

Eurofins | mgt reference: **564136**

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 : 10.5 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:

[REDACTED] on Phone : or by e.mail: [REDACTED]

Results will be delivered electronically via e.mail to [REDACTED] - [REDACTED]

Certificate of Analysis

AECOM Aust Pty Ltd Perth
Level 4, 3 Forrest Place
Perth
WA 6000



NATA Accredited
Accreditation Number 1261
Site Number 23736

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:

Report 565739-S
Project name AIRSERVICESLS1
Project ID 6431717
Received Date Oct 02, 2017

Client Sample ID			SQA12_021017	SQA13_021017
Sample Matrix			Soil	Soil
Eurofins mgt Sample No.			P17-Oc00847	P17-Oc00848
Date Sampled			Oct 02, 2017	Oct 02, 2017
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
BTEX				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	71	74
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
TRH >C10-C16	50	mg/kg	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100
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 (PFUnA) ^{N11}	5	ug/kg	< 5	< 5
Perfluorododecanoic acid (PFDoA) ^{N11}	5	ug/kg	< 5	< 5
Perfluorotridecanoic acid (PFTTrDA)	5	ug/kg	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	5	ug/kg	< 5	< 5
13C4-PFBA (surr.)	1	%	119	118

Client Sample ID			SQA12_021017	SQA13_021017
Sample Matrix			Soil	Soil
Eurofins mgt Sample No.			P17-Oc00847	P17-Oc00848
Date Sampled			Oct 02, 2017	Oct 02, 2017
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
13C5-PFPeA (surr.)	1	%	98	99
13C5-PFHxA (surr.)	1	%	120	121
13C4-PFHpA (surr.)	1	%	120	117
13C8-PFOA (surr.)	1	%	116	116
13C5-PFNA (surr.)	1	%	120	118
13C6-PFDA (surr.)	1	%	131	122
13C2-PFUnDA (surr.)	1	%	142	143
13C2-PFDoDA (surr.)	1	%	132	135
13C2-PFTeDA (surr.)	1	%	131	132
Perfluoroalkane sulfonamides (PFASAs)				
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	113
D3-N-MeFOSA (surr.)	1	%	128	127
D5-N-EtFOSA (surr.)	1	%	107	108
D7-N-MeFOSE (surr.)	1	%	109	106
D9-N-EtFOSE (surr.)	1	%	112	111
D5-N-EtFOSAA (surr.)	1	%	142	136
D3-N-MeFOSAA (surr.)	1	%	167	152
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)				
Perfluorobutanesulfonic acid (PFBS) ^{N11}	5	ug/kg	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)	5	ug/kg	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	5	ug/kg	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)	5	ug/kg	< 5	< 5
Perfluorooctanesulfonic acid (PFOS) ^{N11}	5	ug/kg	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)	5	ug/kg	< 5	< 5
13C3-PFBS (surr.)	1	%	124	122
18O2-PFHxS (surr.)	1	%	128	124
13C8-PFOS (surr.)	1	%	125	122
n:2 Fluorotelomer sulfonic acids				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS) ^{N11}	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS) ^{N11}	10	ug/kg	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS) ^{N11}	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	5	ug/kg	< 5	< 5
13C2-4:2 FTS (surr.)	1	%	112	121
13C2-6:2 FTS (surr.)	1	%	119	124
13C2-8:2 FTS (surr.)	1	%	Q09 INT	Q09 INT

Client Sample ID			SQA12_021017	SQA13_021017
Sample Matrix			Soil	Soil
Eurofins mgt Sample No.			P17-Oc00847	P17-Oc00848
Date Sampled			Oct 02, 2017	Oct 02, 2017
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
% Moisture	1	%	2.3	4.2

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C36	Melbourne	Oct 04, 2017	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 04, 2017	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 04, 2017	14 Day
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 04, 2017	14 Day
Per- and Polyfluorinated Alkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 03, 2017	180 Day
Perfluoroalkane sulfonamides (PFASAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 03, 2017	180 Day
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 03, 2017	180 Day
n:2 Fluorotelomer sulfonic acids - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 03, 2017	180 Day
% Moisture - Method: LTM-GEN-7080 Moisture	Melbourne	Oct 02, 2017	14 Day

Company Name: AECOM Aust Pty Ltd Perth
Address: Level 4, 3 Forrest Place
Perth
WA 6000
Project Name: AIRSERVICESLS1
Project ID: 6431717

Order No.:
Report #: 565739
Phone: 08 6208 0000
Fax:

Received: Oct 2, 2017 12:00 AM
Due: Oct 9, 2017
Priority: 5 Day
Contact Name: [REDACTED]

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail						BTEX	Moisture Set	Total Recoverable Hydrocarbons	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									X
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
1	SQA12_021017	Oct 02, 2017		Soil	P17-Oc00847	X	X	X	X
2	SQA13_021017	Oct 02, 2017		Soil	P17-Oc00848	X	X	X	X
Test Counts						2	2	2	2

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 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 Sample Receipt Advice.

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

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

****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							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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							
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 (PFUnA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTriDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkane sulfonamides (PFASAs)							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
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							
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAAs)							
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	

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5		5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5		5	Pass	
Method Blank						
n:2 Fluorotelomer sulfonic acids						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	ug/kg	< 5		5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	ug/kg	< 10		10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	ug/kg	< 5		5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	ug/kg	< 5		5	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	%	118		70-130	Pass	
TRH C10-C14	%	79		70-130	Pass	
LCS - % Recovery						
BTEX						
Benzene	%	91		70-130	Pass	
Toluene	%	91		70-130	Pass	
Ethylbenzene	%	87		70-130	Pass	
m&p-Xylenes	%	88		70-130	Pass	
Xylenes - Total	%	87		70-130	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene	%	91		70-130	Pass	
TRH C6-C10	%	126		70-130	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	%	85		70-130	Pass	
LCS - % Recovery						
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)	%	99		50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	122		50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	109		50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	110		50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	103		50-150	Pass	
Perfluorononanoic acid (PFNA)	%	105		50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	103		50-150	Pass	
Perfluoroundecanoic acid (PFUnA)	%	105		50-150	Pass	
Perfluorododecanoic acid (PFDoA)	%	103		50-150	Pass	
Perfluorotridecanoic acid (PFTTrDA)	%	120		50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	117		50-150	Pass	
LCS - % Recovery						
Perfluoroalkane sulfonamides (PFASAs)						
Perfluorooctane sulfonamide (FOSA)	%	110		50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	117		50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	113		50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	133		50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	114		50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	108		50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	117		50-150	Pass	
LCS - % Recovery						
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)	%	108		50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	113		50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	106		50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	108		50-150	Pass	

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctanesulfonic acid (PFOS)				%	112			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)				%	99			50-150	Pass	
LCS - % Recovery										
n:2 Fluorotelomer sulfonic acids										
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)				%	95			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)				%	94			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)				%	87			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)				%	135			50-150	Pass	
Test	Lab Sample ID	QA Source		Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery										
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					Result 1					
TRH C6-C9	P17-Se33444	NCP	%	101				70-130	Pass	
TRH C10-C14	P17-Oc00711	NCP	%	73				70-130	Pass	
Spike - % Recovery										
BTEX					Result 1					
Benzene	P17-Se33444	NCP	%	94				70-130	Pass	
Toluene	P17-Se33444	NCP	%	98				70-130	Pass	
Ethylbenzene	P17-Se33444	NCP	%	96				70-130	Pass	
m&p-Xylenes	P17-Se33444	NCP	%	98				70-130	Pass	
o-Xylene	P17-Se33444	NCP	%	96				70-130	Pass	
Xylenes - Total	P17-Se33444	NCP	%	98				70-130	Pass	
Spike - % Recovery										
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					Result 1					
Naphthalene	P17-Se33444	NCP	%	106				70-130	Pass	
TRH C6-C10	P17-Se33444	NCP	%	103				70-130	Pass	
Spike - % Recovery										
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					Result 1					
TRH >C10-C16	P17-Oc00711	NCP	%	77				70-130	Pass	
Spike - % Recovery										
Perfluoroalkyl carboxylic acids (PFCAs)					Result 1					
Perfluorobutanoic acid (PFBA)	B17-Se35434	NCP	%	109				50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B17-Se35434	NCP	%	135				50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B17-Se35434	NCP	%	116				50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B17-Se35434	NCP	%	114				50-150	Pass	
Perfluorooctanoic acid (PFOA)	B17-Se35434	NCP	%	115				50-150	Pass	
Perfluorononanoic acid (PFNA)	B17-Se35434	NCP	%	113				50-150	Pass	
Perfluorodecanoic acid (PFDA)	B17-Se35434	NCP	%	106				50-150	Pass	
Perfluoroundecanoic acid (PFUnA)	B17-Se35434	NCP	%	123				50-150	Pass	
Perfluorododecanoic acid (PFDoA)	B17-Se35434	NCP	%	118				50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B17-Se35434	NCP	%	137				50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B17-Se35434	NCP	%	136				50-150	Pass	
Spike - % Recovery										
Perfluoroalkane sulfonamides (PFASAs)					Result 1					
Perfluorooctane sulfonamide (FOSA)	B17-Se35434	NCP	%	110				50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B17-Se35434	NCP	%	115				50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B17-Se35434	NCP	%	134				50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B17-Se35434	NCP	%	124				50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B17-Se35434	NCP	%	137				50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B17-Se35434	NCP	%	110			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B17-Se35434	NCP	%	113			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B17-Se35434	NCP	%	117			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B17-Se35434	NCP	%	103			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B17-Se35434	NCP	%	110			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B17-Se35434	NCP	%	99			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B17-Se35434	NCP	%	113			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B17-Se35434	NCP	%	136			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	B17-Se35434	NCP	%	106			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	B17-Se35434	NCP	%	106			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	B17-Se35434	NCP	%	65			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	B17-Se35434	NCP	%	136			50-150	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	M17-Se37256	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	P17-Oc00700	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	P17-Oc00700	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	P17-Oc00700	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M17-Se37256	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M17-Se37256	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M17-Se37256	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M17-Se37256	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M17-Se37256	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M17-Se37256	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M17-Se37256	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M17-Se37256	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	P17-Oc00700	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	P17-Oc00700	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	P17-Oc00700	NCP	mg/kg	< 100	< 100	<1	30%	Pass	

Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD		
Perfluorobutanoic acid (PFBA)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoropentanoic acid (PFPeA)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorohexanoic acid (PFHxA)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoroheptanoic acid (PFHpA)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorooctanoic acid (PFOA)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorononanoic acid (PFNA)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorodecanoic acid (PFDA)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoroundecanoic acid (PFUnA)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorododecanoic acid (PFDoA)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorotridecanoic acid (PFTTrDA)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorotetradecanoic acid (PFTeDA)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Duplicate								
Perfluoroalkane sulfonamides (PFASAs)				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M17-Oc00380	NCP	ug/kg	< 10	< 10	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M17-Oc00380	NCP	ug/kg	< 10	< 10	<1	30%	Pass
Duplicate								
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Duplicate								
n:2 Fluorotelomer sulfonic acids				Result 1	Result 2	RPD		
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	M17-Oc00380	NCP	ug/kg	< 10	< 10	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	M17-Oc00380	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	P17-Oc00720	NCP	%	5.0	4.2	17	30%	Pass

Comments

Some surrogate recoveries were recorded in excess of the QC limit designated in QSM 5.1 of 50-150%. Since no positive results were reported for any PFAS compounds for any of the Samples in this case no data was affected.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
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.
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. 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).
Q09	The Surrogate recovery is outside of the recommended acceptance criteria due to matrix interference. Acceptance criteria were met for all other QC

Authorised By

	Analytical Services Manager
	Senior Analyst-Metal (VIC)
	Senior Analyst-Organic (VIC)
	Senior Analyst-Volatile (VIC)
	Senior Analyst-Inorganic (VIC)
	Senior Analyst-Organic (QLD)
	Senior Analyst-Organic (VIC)



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](#).

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mgt

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CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : AECOM Services	Contact Name:	Purchase Order :	COC Number :
Office Address : Perth Office	Project Manager :	PROJECT Number : 6431717	Eurofins mgt quote ID : URS Rates
Level 3, 3 Forrest Place, Perth, 6000	Email for results :	PROJECT Name : Airservices	Data output format:

Special Directions & Comments :	Analyte	Some common holding times (with correct preservation). For further information contact the lab			
		Waters		Soils	
Eurofins mgt DI water batch number:	TRH/BTEX PAS full suite	BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
		TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
		Heavy Metals	6 months	Heavy Metals	6 months
		Mercury, CrVI	28 days	Mercury, CrVI	28 days
		Microbiological testing	24 hours	Microbiological testing	72 hours
		BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
		Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
		Ferrous iron	7 days	ASLP, TCLP	7 days

Sample ID	Date	Matrix	1LP	250P	125P	1_A	40mL vial	125mL A	Jar	Sample comments:
1	02/10/17	02/1/10								
2	02/10/17	02/1/10								
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										

Relinquished By:	Laboratory Staff	Turn around time	Method Of Shipment	Temperature on arrival:
Date & Time: 02/10/17 4:00pm	Received By: 02/10/17 4:20pm	1 DAY ☐ 2 DAY ☐ 3 DAY ☐ 5 DAY ☒ 10 DAY ☐ Other:	☐ Courier ☐ Hand Delivered ☐ Postal Courier Consignment # :	Report number: 565 739
Signature: [Signature]	Signature: [Signature]			

Sample Receipt Advice

Company name: **AECOM Aust Pty Ltd Perth**

Contact name: [REDACTED]

Project name: **AIRSERVICESLS1**

Project ID: **6431717**

COC number: **Not provided**

Turn around time: **5 Day**

Date/Time received: **Oct 2, 2017**

Eurofins | mgt reference: **565739**

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.
- ☒ 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:

[REDACTED] on Phone : or by e.mail: [REDACTED]

Results will be delivered electronically via e.mail to [REDACTED] - [REDACTED]

Company Name: AECOM Aust Pty Ltd Perth
Address: Level 4, 3 Forrest Place
Perth
WA 6000
Project Name: AIRSERVICESLS1
Project ID: 6431717

Order No.:
Report #: 565739
Phone: 08 6208 0000
Fax:

Received: Oct 2, 2017 12:00 AM
Due: Oct 9, 2017
Priority: 5 Day
Contact Name: [REDACTED]

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail						BTEX	Moisture Set	Total Recoverable Hydrocarbons	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									X
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
1	SQA12_021017	Oct 02, 2017		Soil	P17-Oc00847	X	X	X	X
2	SQA13_021017	Oct 02, 2017		Soil	P17-Oc00848	X	X	X	X
Test Counts						2	2	2	2

Certificate of Analysis

AECOM Aust Pty Ltd Perth
Level 4, 3 Forrest Place
Perth
WA 6000



NATA Accredited
Accreditation Number 1261
Site Number 23736

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:

Report 565919-S
Project name PAPL LS1
Project ID 60543717 - 1.3
Received Date Oct 03, 2017

Client Sample ID			SQA14_031017
Sample Matrix			Soil
Eurofins mgt Sample No.			P17-Oc02210
Date Sampled			Oct 03, 2017
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
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	60
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.5	mg/kg	< 0.5
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
TRH >C10-C16	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA) ^{N11}	5	ug/kg	< 5
Perfluoropentanoic acid (PFPeA) ^{N11}	5	ug/kg	< 5
Perfluorohexanoic acid (PFHxA) ^{N11}	5	ug/kg	< 5
Perfluoroheptanoic acid (PFHpA) ^{N11}	5	ug/kg	< 5
Perfluorooctanoic acid (PFOA) ^{N11}	5	ug/kg	< 5
Perfluorononanoic acid (PFNA) ^{N11}	5	ug/kg	< 5
Perfluorodecanoic acid (PFDA) ^{N11}	5	ug/kg	< 5
Perfluoroundecanoic acid (PFUnA) ^{N11}	5	ug/kg	< 5
Perfluorododecanoic acid (PFDoA) ^{N11}	5	ug/kg	< 5
Perfluorotridecanoic acid (PFTTrDA)	5	ug/kg	< 5
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	5	ug/kg	< 5
13C4-PFBA (surr.)	1	%	145

Client Sample ID			SQA14_031017
Sample Matrix			Soil
Eurofins mgt Sample No.			P17-Oc02210
Date Sampled			Oct 03, 2017
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
13C5-PFPeA (surr.)	1	%	140
13C5-PFHxA (surr.)	1	%	142
13C4-PFHpA (surr.)	1	%	135
13C8-PFOA (surr.)	1	%	129
13C5-PFNA (surr.)	1	%	129
13C6-PFDA (surr.)	1	%	150
13C2-PFUnDA (surr.)	1	%	155
13C2-PFDoDA (surr.)	1	%	139
13C2-PFTeDA (surr.)	1	%	105
Perfluoroalkane sulfonamides (PFASAs)			
Perfluorooctane sulfonamide (FOSA) ^{N11}	5	ug/kg	^{N09} 13
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	5	ug/kg	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	5	ug/kg	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	5	ug/kg	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	5	ug/kg	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	10	ug/kg	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	10	ug/kg	< 10
13C8-FOSA (surr.)	1	%	115
D3-N-MeFOSA (surr.)	1	%	116
D5-N-EtFOSA (surr.)	1	%	95
D7-N-MeFOSE (surr.)	1	%	60
D9-N-EtFOSE (surr.)	1	%	101
D5-N-EtFOSAA (surr.)	1	%	140
D3-N-MeFOSAA (surr.)	1	%	145
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)			
Perfluorobutanesulfonic acid (PFBS) ^{N11}	5	ug/kg	< 5
Perfluoropentanesulfonic acid (PFPeS)	5	ug/kg	< 5
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	5	ug/kg	< 5
Perfluoroheptanesulfonic acid (PFHpS)	5	ug/kg	< 5
Perfluorooctanesulfonic acid (PFOS) ^{N11}	5	ug/kg	^{N09} 130
Perfluorodecanesulfonic acid (PFDS)	5	ug/kg	^{N09} 18
13C3-PFBS (surr.)	1	%	126
18O2-PFHxS (surr.)	1	%	139
13C8-PFOS (surr.)	1	%	136
n:2 Fluorotelomer sulfonic acids			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS) ^{N11}	5	ug/kg	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS) ^{N11}	10	ug/kg	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS) ^{N11}	5	ug/kg	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	5	ug/kg	< 5
13C2-4:2 FTS (surr.)	1	%	109
13C2-6:2 FTS (surr.)	1	%	128
13C2-8:2 FTS (surr.)	1	%	180

Client Sample ID			SQA14_031017
Sample Matrix			Soil
Eurofins mgt Sample No.			P17-Oc02210
Date Sampled			Oct 03, 2017
Test/Reference	LOR	Unit	
PFASs Summations			
Sum (PFHxS + PFOS)	5	ug/kg	130
Sum of US EPA PFAS (PFOS + PFOA)	5	ug/kg	130
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	5	ug/kg	130
Sum of WA DER PFAS (n=10)	10	ug/kg	130
Sum of PFASs (n=28)	50	ug/kg	161
% Moisture	1	%	3.7

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
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C36	Melbourne	Oct 07, 2017	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 07, 2017	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 07, 2017	14 Day
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 07, 2017	14 Day
Per- and Polyfluorinated Alkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 11, 2017	180 Day
Perfluoroalkane sulfonamides (PFASAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 11, 2017	180 Day
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 11, 2017	180 Day
n:2 Fluorotelomer sulfonic acids - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 11, 2017	180 Day
% Moisture - Method: LTM-GEN-7080 Moisture	Melbourne	Oct 03, 2017	14 Day

Company Name: AECOM Aust Pty Ltd Perth
Address: Level 4, 3 Forrest Place
Perth
WA 6000
Project Name: PAPL LS1
Project ID: 60543717 - 1.3

Order No.:
Report #: 565919
Phone: 08 6208 0000
Fax:

Received: Oct 3, 2017 12:29 PM
Due: Oct 10, 2017
Priority: 5 Day
Contact Name: [REDACTED]

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail						BTEX	Moisture Set	Total Recoverable Hydrocarbons	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									X
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
1	SQA14_03101 7	Oct 03, 2017		Soil	P17-Oc02210	X	X	X	X
Test Counts						1	1	1	1

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 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 Sample Receipt Advice.

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

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

****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							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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							
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 (PFUnA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkane sulfonamides (PFASAs)							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
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							
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAAs)							
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	

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5		5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5		5	Pass	
Method Blank						
n:2 Fluorotelomer sulfonic acids						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	ug/kg	< 5		5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	ug/kg	< 10		10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	ug/kg	< 5		5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	ug/kg	< 5		5	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	%	100		70-130	Pass	
TRH C10-C14	%	112		70-130	Pass	
LCS - % Recovery						
BTEX						
Benzene	%	104		70-130	Pass	
Toluene	%	95		70-130	Pass	
Ethylbenzene	%	82		70-130	Pass	
m&p-Xylenes	%	78		70-130	Pass	
Xylenes - Total	%	78		70-130	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene	%	130		70-130	Pass	
TRH C6-C10	%	96		70-130	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	%	114		70-130	Pass	
LCS - % Recovery						
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)	%	122		50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	99		50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	100		50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	101		50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	117		50-150	Pass	
Perfluorononanoic acid (PFNA)	%	105		50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	96		50-150	Pass	
Perfluoroundecanoic acid (PFUnA)	%	97		50-150	Pass	
Perfluorododecanoic acid (PFDoA)	%	100		50-150	Pass	
Perfluorotridecanoic acid (PFTTrDA)	%	131		50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	107		50-150	Pass	
LCS - % Recovery						
Perfluoroalkane sulfonamides (PFASAs)						
Perfluorooctane sulfonamide (FOSA)	%	92		50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	101		50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	121		50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	87		50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	110		50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	107		50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	113		50-150	Pass	
LCS - % Recovery						
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)	%	87		50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	104		50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	102		50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	121		50-150	Pass	

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctanesulfonic acid (PFOS)				%	93			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)				%	103			50-150	Pass	
LCS - % Recovery										
n:2 Fluorotelomer sulfonic acids										
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)				%	110			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)				%	118			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)				%	124			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)				%	136			50-150	Pass	
Test	Lab Sample ID	QA Source		Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery										
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					Result 1					
TRH C6-C9	M17-Oc06652	NCP	%	74				70-130	Pass	
TRH C10-C14	M17-Oc05356	NCP	%	77				70-130	Pass	
Spike - % Recovery										
BTEX					Result 1					
Benzene	M17-Oc06652	NCP	%	113				70-130	Pass	
Toluene	M17-Oc06652	NCP	%	111				70-130	Pass	
Ethylbenzene	M17-Oc06652	NCP	%	107				70-130	Pass	
m&p-Xylenes	M17-Oc06652	NCP	%	110				70-130	Pass	
o-Xylene	M17-Oc06652	NCP	%	108				70-130	Pass	
Xylenes - Total	M17-Oc06652	NCP	%	109				70-130	Pass	
Spike - % Recovery										
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					Result 1					
Naphthalene	M17-Oc06652	NCP	%	124				70-130	Pass	
TRH C6-C10	M17-Oc06652	NCP	%	70				70-130	Pass	
Spike - % Recovery										
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					Result 1					
TRH >C10-C16	M17-Oc05356	NCP	%	82				70-130	Pass	
Spike - % Recovery										
Perfluoroalkyl carboxylic acids (PFCAs)					Result 1					
Perfluorobutanoic acid (PFBA)	B17-Oc10905	NCP	%	85				50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B17-Oc10905	NCP	%	91				50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B17-Oc10905	NCP	%	95				50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B17-Oc10905	NCP	%	96				50-150	Pass	
Perfluorooctanoic acid (PFOA)	B17-Oc10905	NCP	%	111				50-150	Pass	
Perfluorononanoic acid (PFNA)	B17-Oc10905	NCP	%	103				50-150	Pass	
Perfluorodecanoic acid (PFDA)	B17-Oc10905	NCP	%	92				50-150	Pass	
Perfluoroundecanoic acid (PFUnA)	B17-Oc10905	NCP	%	93				50-150	Pass	
Perfluorododecanoic acid (PFDoA)	B17-Oc10905	NCP	%	92				50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B17-Oc10905	NCP	%	121				50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B17-Oc10905	NCP	%	119				50-150	Pass	
Spike - % Recovery										
Perfluoroalkane sulfonamides (PFASAs)					Result 1					
Perfluorooctane sulfonamide (FOSA)	B17-Oc10905	NCP	%	81				50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B17-Oc10905	NCP	%	104				50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B17-Oc10905	NCP	%	126				50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B17-Oc10905	NCP	%	55				50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B17-Oc10905	NCP	%	108				50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B17-Oc10905	NCP	%	100			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B17-Oc10905	NCP	%	111			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B17-Oc10905	NCP	%	77			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B17-Oc10905	NCP	%	96			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B17-Oc10905	NCP	%	92			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B17-Oc10905	NCP	%	113			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B17-Oc10905	NCP	%	90			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B17-Oc10905	NCP	%	104			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	B17-Oc10905	NCP	%	93			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	B17-Oc10905	NCP	%	125			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	B17-Oc10905	NCP	%	139			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	B17-Oc10905	NCP	%	137			50-150	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	P17-Oc02138	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	B17-Oc06613	NCP	mg/kg	2100	1900	7.0	30%	Pass	
TRH C15-C28	B17-Oc06613	NCP	mg/kg	11000	11000	1.0	30%	Pass	
TRH C29-C36	B17-Oc06613	NCP	mg/kg	6100	6200	1.0	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	P17-Oc02138	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	P17-Oc02138	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	P17-Oc02138	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	P17-Oc02138	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	P17-Oc02138	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	P17-Oc02138	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	P17-Oc02138	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	P17-Oc02138	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	B17-Oc06613	NCP	mg/kg	3400	3300	5.0	30%	Pass	
TRH >C16-C34	B17-Oc06613	NCP	mg/kg	15000	15000	<1	30%	Pass	
TRH >C34-C40	B17-Oc06613	NCP	mg/kg	3900	3900	<1	30%	Pass	

Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD		
Perfluorobutanoic acid (PFBA)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoropentanoic acid (PFPeA)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorohexanoic acid (PFHxA)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoroheptanoic acid (PFHpA)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorooctanoic acid (PFOA)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorononanoic acid (PFNA)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorodecanoic acid (PFDA)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoroundecanoic acid (PFUnA)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorododecanoic acid (PFDoA)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorotridecanoic acid (PFTTrDA)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorotetradecanoic acid (PFTeDA)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Duplicate								
Perfluoroalkane sulfonamides (PFASAs)				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B17-Oc10901	NCP	ug/kg	< 10	< 10	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B17-Oc10901	NCP	ug/kg	< 10	< 10	<1	30%	Pass
Duplicate								
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	B17-Oc10901	NCP	ug/kg	5.1	5.2	2.0	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	B17-Oc10901	NCP	ug/kg	39	39	2.0	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Duplicate								
n:2 Fluorotelomer sulfonic acids				Result 1	Result 2	RPD		
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	B17-Oc10901	NCP	ug/kg	< 10	< 10	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	B17-Oc10901	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	P17-Oc02413	NCP	%	5.2	5.4	4.0	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	N/A
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.
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. 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

	Analytical Services Manager
	Senior Analyst-Metal (VIC)
	Senior Analyst-Organic (QLD)
	Senior Analyst-Organic (VIC)
	Senior Analyst-Volatile (VIC)
	Senior Analyst-Organic (VIC)
	Senior Analyst-Inorganic (VIC)



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](#).

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mgt

**Sydney**

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Email: EnviroSampleVic@eurofins.com.au

CHAIN OF CUSTODY RECORD**CLIENT DETAILS**

Page 1 of 1

Company Name : AECOM Services	Contact Name : [REDACTED]	Purchase Order :	COC Number :
Office Address : Perth Office	Project Manager :	PROJECT Number : 60513717-1-3	Eurofins mgt quote ID : URS Rates
Level 3, 3 Forrest Place, Perth, 6000	Email for results :	PROJECT Name : PAULISI	Data output format :

Special Directions & Comments :

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	T1	T2								Containers:							Sample comments:
													1LP	250P	125P	1LA	40mL vial	125mL A	Jar	
1	SQA14-031017			X	X															
2																				
3		3/10	S																	
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				
13																				
14																				
15																				
16																				

Relinquished By: [REDACTED]	Received By: [REDACTED]	Turn around time	Method Of Shipment	Temperature on arrival:
Date & Time: 12:00 03-10-17	Date & Time: 03/10/17	1 DAY ☐ 2 DAY ☐ 3 DAY ☐ 5 DAY ☐ 10 DAY ☐ Other:	☐ Courier ☐ Hand Delivered ☐ Postal Courier Consignment # :	Report number: 565919
Signature: [Signature]	Signature: [Signature]			

Sample Receipt Advice

Company name: **AECOM Aust Pty Ltd Perth**

Contact name: [REDACTED]

Project name: **PAPL LS1**

Project ID: **60543717 - 1.3**

COC number: **Not provided**

Turn around time: **5 Day**

Date/Time received: **Oct 3, 2017 12:29 PM**

Eurofins | mgt reference: **565919**

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 : 17.4 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.
- ☒ 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:

[REDACTED] on Phone : or by e.mail: [REDACTED]

Results will be delivered electronically via e.mail to [REDACTED] - [REDACTED]

Company Name: AECOM Aust Pty Ltd Perth
Address: Level 4, 3 Forrest Place
Perth
WA 6000
Project Name: PAPL LS1
Project ID: 60543717 - 1.3

Order No.:
Report #: 565919
Phone: 08 6208 0000
Fax:

Received: Oct 3, 2017 12:29 PM
Due: Oct 10, 2017
Priority: 5 Day
Contact Name: [REDACTED]

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail						BTEX	Moisture Set	Total Recoverable Hydrocarbons	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									X
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
1	SQA14_031017	Oct 03, 2017		Soil	P17-Oc02210	X	X	X	X
Test Counts						1	1	1	1

Certificate of Analysis

AECOM Aust Pty Ltd Perth
Level 4, 3 Forrest Place
Perth
WA 6000



NATA Accredited
Accreditation Number 1261
Site Number 23736

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:

Report 566601-W
Project name
Project ID 60543717
Received Date Oct 06, 2017

Client Sample ID			WQA12_061017
Sample Matrix			Water
Eurofins mgt Sample No.			P17-Oc07397
Date Sampled			Oct 06, 2017
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	74
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.01	mg/L	< 0.01
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA) ^{N11}	0.05	ug/L	< 0.05
Perfluoropentanoic acid (PFPeA) ^{N11}	0.01	ug/L	^{N09} 0.01
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	^{N09} 0.08
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	^{N09} 0.02
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	^{N09} 0.05
Perfluorononanoic acid (PFNA) ^{N11}	0.01	ug/L	< 0.01
Perfluorodecanoic acid (PFDA) ^{N11}	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnA) ^{N11}	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoA) ^{N11}	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTTrDA)	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.01	ug/L	< 0.01

Client Sample ID			WQA12_061017
Sample Matrix			Water
Eurofins mgt Sample No.			P17-Oc07397
Date Sampled			Oct 06, 2017
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
13C4-PFBA (surr.)	1	%	28
13C5-PFPeA (surr.)	1	%	36
13C5-PFHxA (surr.)	1	%	43
13C4-PFHpA (surr.)	1	%	34
13C8-PFOA (surr.)	1	%	35
13C5-PFNA (surr.)	1	%	34
13C6-PFDA (surr.)	1	%	24
13C2-PFUnDA (surr.)	1	%	16
13C2-PFDoDA (surr.)	1	%	15
13C2-PFTeDA (surr.)	1	%	Q09INT
Perfluoroalkane sulfonamides (PFASAs)			
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	18
D3-N-MeFOSA (surr.)	1	%	10
D5-N-EtFOSA (surr.)	1	%	12
D7-N-MeFOSE (surr.)	1	%	15
D9-N-EtFOSE (surr.)	1	%	13
D5-N-EtFOSAA (surr.)	1	%	13
D3-N-MeFOSAA (surr.)	1	%	16
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAAs)			
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	N090.04
Perfluoropentanesulfonic acid (PFPeS)	0.01	ug/L	N090.05
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.01	ug/L	N090.73
Perfluoroheptanesulfonic acid (PFHpS)	0.01	ug/L	N090.06
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	N092.4
Perfluorodecanesulfonic acid (PFDS)	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	36
18O2-PFHxS (surr.)	1	%	28
13C8-PFOS (surr.)	1	%	22
n:2 Fluorotelomer sulfonic acids			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS) ^{N11}	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS) ^{N11}	0.05	ug/L	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS) ^{N11}	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	0.01	ug/L	< 0.01
13C2-4:2 FTS (surr.)	1	%	59
13C2-6:2 FTS (surr.)	1	%	32
13C2-8:2 FTS (surr.)	1	%	23

Client Sample ID			WQA12_061017
Sample Matrix			Water
Eurofins mgt Sample No.			P17-Oc07397
Date Sampled			Oct 06, 2017
Test/Reference	LOR	Unit	
PFASs Summations			
Sum (PFHxS + PFOS)	0.01	ug/L	3.13
Sum of US EPA PFAS (PFOS + PFOA)	0.01	ug/L	2.45
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	0.01	ug/L	3.18
Sum of WA DER PFAS (n=10)	0.05	ug/L	3.33
Sum of PFASs (n=28)	0.1	ug/L	3.44

Sample History

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

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

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C36	Melbourne	Oct 11, 2017	7 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 10, 2017	7 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 11, 2017	7 Day
BTEX and Naphthalene			
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 10, 2017	14 Day
Per- and Polyfluorinated Alkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 11, 2017	14 Day
Perfluoroalkane sulfonamides (PFASAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 11, 2017	14 Day
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 11, 2017	14 Day
n:2 Fluorotelomer sulfonic acids - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 11, 2017	14 Day

Company Name: AECOM Aust Pty Ltd Perth
Address: Level 4, 3 Forrest Place
Perth
WA 6000

Project Name:
Project ID: 60543717

Order No.:
Report #: 566601
Phone: 08 6208 0000
Fax:

Received: Oct 6, 2017 4:24 PM
Due: Oct 13, 2017
Priority: 5 Day
Contact Name: [REDACTED]

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail						BTEX and Naphthalene	Total Recoverable Hydrocarbons	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	WQA12_061017	Oct 06, 2017		Water	P17-Oc07397	X	X	X
Test Counts						1	1	1

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 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 Sample Receipt Advice.

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

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

****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							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
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 (PFUnA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkane sulfonamides (PFASAs)							
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							
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFASs)							
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	116			70-130	Pass	
TRH C10-C14	%	77			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	115			70-130	Pass	
Toluene	%	106			70-130	Pass	
Ethylbenzene	%	90			70-130	Pass	
m&p-Xylenes	%	95			70-130	Pass	
Xylenes - Total	%	94			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	92			70-130	Pass	
TRH C6-C10	%	113			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	77			70-130	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	130			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	111			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	92			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	117			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	121			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	127			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	110			50-150	Pass	
Perfluoroundecanoic acid (PFUnA)	%	122			50-150	Pass	
Perfluorododecanoic acid (PFDoA)	%	104			50-150	Pass	
Perfluorotridecanoic acid (PFTriDA)	%	136			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	112			50-150	Pass	
LCS - % Recovery							
Perfluoroalkane sulfonamides (PFASAs)							
Perfluorooctane sulfonamide (FOSA)	%	106			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	128			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	120			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	132			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	123			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	128			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	126			50-150	Pass	
LCS - % Recovery							
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	91			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	107			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	98			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	97			50-150	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctanesulfonic acid (PFOS)			%	99			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)			%	119			50-150	Pass	
LCS - % Recovery									
n:2 Fluorotelomer sulfonic acids									
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)			%	111			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)			%	129			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)			%	124			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)			%	112			50-150	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M17-Oc03118	NCP	%	109			70-130	Pass	
TRH C10-C14	M17-Oc08751	NCP	%	118			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M17-Oc03118	NCP	%	110			70-130	Pass	
Toluene	M17-Oc03118	NCP	%	107			70-130	Pass	
Ethylbenzene	M17-Oc03118	NCP	%	87			70-130	Pass	
m&p-Xylenes	M17-Oc03118	NCP	%	92			70-130	Pass	
o-Xylene	M17-Oc03118	NCP	%	89			70-130	Pass	
Xylenes - Total	M17-Oc03118	NCP	%	91			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M17-Oc03118	NCP	%	74			70-130	Pass	
TRH C6-C10	M17-Oc03118	NCP	%	106			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M17-Oc08751	NCP	%	123			70-130	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B17-Oc05645	NCP	%	145			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B17-Oc05645	NCP	%	124			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B17-Oc05645	NCP	%	100			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B17-Oc05645	NCP	%	123			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B17-Oc05645	NCP	%	138			50-150	Pass	
Perfluorononanoic acid (PFNA)	B17-Oc05645	NCP	%	132			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B17-Oc05645	NCP	%	115			50-150	Pass	
Perfluoroundecanoic acid (PFUnA)	B17-Oc05645	NCP	%	127			50-150	Pass	
Perfluorododecanoic acid (PFDoA)	B17-Oc05645	NCP	%	123			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B17-Oc05645	NCP	%	134			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B17-Oc05645	NCP	%	123			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonamides (PFASAs)				Result 1					
Perfluorooctane sulfonamide (FOSA)	B17-Oc05645	NCP	%	119			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B17-Oc05645	NCP	%	131			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B17-Oc05645	NCP	%	106			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B17-Oc05645	NCP	%	138			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B17-Oc05645	NCP	%	132			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B17-Oc05645	NCP	%	135			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B17-Oc05645	NCP	%	116			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSA's)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B17-Oc05645	NCP	%	93			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B17-Oc05645	NCP	%	96			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B17-Oc05645	NCP	%	109			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B17-Oc05645	NCP	%	119			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B17-Oc05645	NCP	%	121			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B17-Oc05645	NCP	%	136			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	B17-Oc05645	NCP	%	114			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	B17-Oc05645	NCP	%	142			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	B17-Oc05645	NCP	%	126			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	B17-Oc05645	NCP	%	115			50-150	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	M17-Oc03283	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M17-Oc08750	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M17-Oc08750	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M17-Oc08750	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M17-Oc03283	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M17-Oc03283	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M17-Oc03283	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M17-Oc03283	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M17-Oc03283	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M17-Oc03283	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M17-Oc03283	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M17-Oc03283	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M17-Oc08750	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M17-Oc08750	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M17-Oc08750	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD		
Perfluorobutanoic acid (PFBA)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Perfluoropentanoic acid (PFPeA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanoic acid (PFHxA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroheptanoic acid (PFHpA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanoic acid (PFOA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorononanoic acid (PFNA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorodecanoic acid (PFDA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroundecanoic acid (PFUnA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorododecanoic acid (PFDoA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotridecanoic acid (PFTTrDA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotetradecanoic acid (PFTeDA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
Perfluoroalkane sulfonamides (PFASAs)				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	B17-Oc05623	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
n:2 Fluorotelomer sulfonic acids				Result 1	Result 2	RPD		
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<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	N/A
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.
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. 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).
Q09	The Surrogate recovery is outside of the recommended acceptance criteria due to matrix interference. Acceptance criteria were met for all other QC

Authorised By

	Analytical Services Manager
	Senior Analyst-Organic (VIC)
	Senior Analyst-Volatile (VIC)
	Senior Analyst-Organic (QLD)
	Senior Analyst-Organic (VIC)



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](#).

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Sample Receipt Advice

Company name: **AECOM Aust Pty Ltd Perth**

Contact name: [REDACTED]

Project ID: 60543717

COC number: Not provided

Turn around time: 5 Day

Date/Time received: Oct 6, 2017 4:24 PM

Eurofins | mgt reference: **566601**

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 : 3.3 degrees Celsius.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- N/A Sample containers for volatile analysis received with zero headspace.
- ☒ 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:

[REDACTED] on Phone : or by e.mail: [REDACTED]

Results will be delivered electronically via e.mail to [REDACTED] - [REDACTED].

Certificate of Analysis

AECOM Aust Pty Ltd Perth
Level 4, 3 Forrest Place
Perth
WA 6000



NATA Accredited
Accreditation Number 1261
Site Number 23736

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:

Report 566735-W
Project name ASA LDS1
Project ID 60543717.1.3
Received Date Oct 09, 2017

Client Sample ID			WQA02_031017	WQA06_041017
Sample Matrix			Water	Water
Eurofins mgt Sample No.			P17-Oc08741	P17-Oc08742
Date Sampled			Oct 03, 2017	Oct 04, 2017
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1	< 0.1
BTEX				
Benzene	0.001	mg/L	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	81	95
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA) ^{N11}	0.05	ug/L	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA) ^{N11}	0.01	ug/L	^{N09} 0.04	0.01
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	^{N09} 0.13	^{N09} < 0.01
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	^{N09} 0.03	0.01
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	^{N09} 0.04	< 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 (PFUnA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTTrDA)	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01

Client Sample ID			WQA02_03101 7	WQA06_04101 7
Sample Matrix			Water	Water
Eurofins mgt Sample No.			P17-Oc08741	P17-Oc08742
Date Sampled			Oct 03, 2017	Oct 04, 2017
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
13C4-PFBA (surr.)	1	%	35	75
13C5-PFPeA (surr.)	1	%	51	103
13C5-PFHxA (surr.)	1	%	62	169
13C4-PFHpA (surr.)	1	%	50	130
13C8-PFOA (surr.)	1	%	54	149
13C5-PFNA (surr.)	1	%	49	151
13C6-PFDA (surr.)	1	%	38	105
13C2-PFUnDA (surr.)	1	%	26	58
13C2-PFDoDA (surr.)	1	%	26	51
13C2-PFTeDA (surr.)	1	%	15	23
Perfluoroalkane sulfonamides (PFASAs)				
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	%	28	83
D3-N-MeFOSA (surr.)	1	%	18	38
D5-N-EtFOSA (surr.)	1	%	15	40
D7-N-MeFOSE (surr.)	1	%	24	52
D9-N-EtFOSE (surr.)	1	%	21	39
D5-N-EtFOSAA (surr.)	1	%	22	48
D3-N-MeFOSAA (surr.)	1	%	24	60
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAAs)				
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	^{N09} 0.12	< 0.01
Perfluoropentanesulfonic acid (PFPeS)	0.01	ug/L	^{N09} 0.11	< 0.01
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.01	ug/L	^{N09} 0.94	^{N09} 0.02
Perfluoroheptanesulfonic acid (PFHpS)	0.01	ug/L	^{N09} 0.03	< 0.01
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	^{N09} 0.43	^{N09} 0.01
Perfluorodecanesulfonic acid (PFDS)	0.01	ug/L	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	53	146
18O2-PFHxS (surr.)	1	%	40	138
13C8-PFOS (surr.)	1	%	31	94
n:2 Fluorotelomer sulfonic acids				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS) ^{N11}	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS) ^{N11}	0.05	ug/L	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS) ^{N11}	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTS (surr.)	1	%	85	^{Q09} INT
13C2-6:2 FTS (surr.)	1	%	48	132
13C2-8:2 FTS (surr.)	1	%	32	80

Client Sample ID			WQA02_031017	WQA06_041017
Sample Matrix			Water	Water
Eurofins mgt Sample No.			P17-Oc08741	P17-Oc08742
Date Sampled			Oct 03, 2017	Oct 04, 2017
Test/Reference	LOR	Unit		
PFASs Summations				
Sum (PFHxS + PFOS)	0.01	ug/L	1.37	0.03
Sum of US EPA PFAS (PFOS + PFOA)	0.01	ug/L	0.47	0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	0.01	ug/L	1.41	0.03
Sum of WA DER PFAS (n=10)	0.05	ug/L	1.73	0.05
Sum of PFASs (n=28)	0.1	ug/L	1.87	< 0.1

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C36	Melbourne	Oct 16, 2017	7 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 10, 2017	7 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 16, 2017	7 Day
BTEX and Naphthalene			
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 10, 2017	14 Day
Per- and Polyfluorinated Alkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 12, 2017	14 Day
Perfluoroalkane sulfonamides (PFASAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 12, 2017	14 Day
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 12, 2017	14 Day
n:2 Fluorotelomer sulfonic acids - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 12, 2017	14 Day

Company Name: AECOM Aust Pty Ltd Perth
Address: Level 4, 3 Forrest Place
Perth
WA 6000
Project Name: ASA LDS1
Project ID: 60543717.1.3

Order No.:
Report #: 566735
Phone: 08 6208 0000
Fax:

Received: Oct 9, 2017 8:53 AM
Due: Oct 16, 2017
Priority: 5 Day
Contact Name: [REDACTED]

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail						BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									X
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
1	WQA02_031017	Oct 03, 2017		Water	P17-Oc08741	X		X	X
2	WQA06_041017	Oct 04, 2017		Water	P17-Oc08742	X		X	X
3	SQA02_041017	Oct 04, 2017		Soil	P17-Oc08743	X	X	X	X
Test Counts						3	1	3	3

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 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 Sample Receipt Advice.

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

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

****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							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
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 (PFUnA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTriDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkane sulfonamides (PFASAs)							
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							
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAAs)							
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	92			70-130	Pass	
TRH C10-C14	%	107			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	96			70-130	Pass	
Toluene	%	95			70-130	Pass	
Ethylbenzene	%	81			70-130	Pass	
m&p-Xylenes	%	85			70-130	Pass	
Xylenes - Total	%	84			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	129			70-130	Pass	
TRH C6-C10	%	91			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	106			70-130	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	130			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	111			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	92			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	117			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	121			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	127			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	110			50-150	Pass	
Perfluoroundecanoic acid (PFUnA)	%	122			50-150	Pass	
Perfluorododecanoic acid (PFDoA)	%	104			50-150	Pass	
Perfluorotridecanoic acid (PFTriDA)	%	136			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	112			50-150	Pass	
LCS - % Recovery							
Perfluoroalkane sulfonamides (PFASAs)							
Perfluorooctane sulfonamide (FOSA)	%	106			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	128			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	120			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	132			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	123			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	128			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	126			50-150	Pass	
LCS - % Recovery							
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	91			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	107			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	98			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	97			50-150	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctanesulfonic acid (PFOS)			%	116			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)			%	119			50-150	Pass	
LCS - % Recovery									
n:2 Fluorotelomer sulfonic acids									
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)			%	111			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)			%	129			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)			%	124			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)			%	112			50-150	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	B17-Oc05478	NCP	%	86			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	B17-Oc05478	NCP	%	79			70-130	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B17-Oc05645	NCP	%	145			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B17-Oc05645	NCP	%	124			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B17-Oc05645	NCP	%	100			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B17-Oc05645	NCP	%	123			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B17-Oc05645	NCP	%	138			50-150	Pass	
Perfluorononanoic acid (PFNA)	B17-Oc05645	NCP	%	132			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B17-Oc05645	NCP	%	115			50-150	Pass	
Perfluoroundecanoic acid (PFUnA)	B17-Oc05645	NCP	%	127			50-150	Pass	
Perfluorododecanoic acid (PFDoA)	B17-Oc05645	NCP	%	123			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B17-Oc05645	NCP	%	134			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B17-Oc05645	NCP	%	123			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonamides (PFASAs)				Result 1					
Perfluorooctane sulfonamide (FOSA)	B17-Oc05645	NCP	%	119			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B17-Oc05645	NCP	%	131			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B17-Oc05645	NCP	%	106			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B17-Oc05645	NCP	%	138			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B17-Oc05645	NCP	%	132			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B17-Oc05645	NCP	%	135			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B17-Oc05645	NCP	%	116			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B17-Oc05645	NCP	%	93			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B17-Oc05645	NCP	%	96			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B17-Oc05645	NCP	%	109			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B17-Oc05645	NCP	%	119			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctanesulfonic acid (PFOS)	B17-Oc05645	NCP	%	121			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B17-Oc05645	NCP	%	136			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	B17-Oc05645	NCP	%	114			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	B17-Oc05645	NCP	%	142			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	B17-Oc05645	NCP	%	126			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	B17-Oc05645	NCP	%	115			50-150	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	M17-Oc05657	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	B17-Oc05476	NCP	mg/L	0.75	0.47	45	30%	Fail	Q15
TRH C15-C28	B17-Oc05476	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	B17-Oc05476	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M17-Oc05657	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M17-Oc05657	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M17-Oc05657	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M17-Oc05657	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M17-Oc05657	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M17-Oc05657	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M17-Oc05657	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M17-Oc05657	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	B17-Oc05476	NCP	mg/L	0.87	0.25	110	30%	Fail	Q15
TRH >C16-C34	B17-Oc05476	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	B17-Oc05476	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTTrDA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate								
Perfluoroalkane sulfonamides (PFASAs)				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
n:2 Fluorotelomer sulfonic acids				Result 1	Result 2	RPD		
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<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	N/A
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.
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. 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).
Q09	The Surrogate recovery is outside of the recommended acceptance criteria due to matrix interference. Acceptance criteria were met for all other QC
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

	Analytical Services Manager
	Senior Analyst-Organic (VIC)
	Senior Analyst-Volatile (VIC)
	Senior Analyst-Organic (QLD)
	Senior Analyst-Organic (VIC)



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](#).

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Company Name:	AECOM Aust Pty Ltd Perth	Order No.:		Received:	Oct 9, 2017 8:53 AM
Address:	Lovel 4, 3 Forrest Place Perth WA 6000	Report #.	568735	Due:	Oct 16, 2017
		Phone:	08 6208 0000	Priority:	5 Day
		Fax:		Contact Name:	[REDACTED]
Project Name:	ASA LDS1				
Project ID:	60543717.1.3				
Eurofins mgt Analytical Services Manager : [REDACTED]					

Sample Detail						BTEX and Naphthalene	Total Recoverable Hydrocarbons	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	WQA02_031017	Oct 03, 2017		Water	P17-Oc08741	X	X	X
2	WQA06_041017	Oct 04, 2017		Water	P17-Oc08742	X	X	X
3	SQA02_041017	Oct 04, 2017		Water	P17-Oc08743	X	X	X
Test Counts						3	3	3

☐ Sydney

Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
Phone: +612 9900 8400
Email: EnviroSampleNSW@eurofins.com.au

☐ Brisbane

Unit 1-21 Smallwood Place, Murrarie
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Email: EnviroSampleQLD@eurofins.com.au

☐ Melbourne

2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: EnviroSampleVic@eurofins.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : AECOM Services

Office Address : Perth Office

Level 6, 3 Forrest Place, Perth, 6000

Contact Name:

Project Manager

Email for results : [REDACTED]

Purchase Order :

PROJECT Number: 60543717.1.3

PROJECT Name: ASA LDS

Page 1 of 1

COC Number :

Eurofins | mgt quote ID : URS Rates

Data output format:

Special Directions & Comments :

Analytes

Some common holding times (with correct preservation).
For further information contact the lab.

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix
1	WQA02_031017	3-10-17	W
2	WQA06_041017	4-10-17	W
3	SQA02_041017	4-10-17	S
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			

[illegible]

Containers:

[illegible]

Sample comments:

Relinquished By:

Received By: [REDACTED]

Turn around time

Method Of Shipment

Temperature on

Date & Time:: 4-10-17

Date & Time:

1 DAY ☐ 2 DAY ☐ 3 DAY ☐

5 DAY ☐ 10 DAY ☐ Other: _____

☐ Courier
☐ Hand Delivered
☐ Postal

Courier Consignment #:

QS3009 R1

Issue Date: 22 August 2013

Page 1 of 1

COC Page ____ vi

Robert Johnston

From: [REDACTED]
Sent: Monday, 9 October 2017 8:53 AM
To: [REDACTED]
Subject: Re: Samples received without COC
Attachments: Screenshot_20171009-084843(1).png

Follow Up Flag: Follow up
Flag Status: Flagged

Hi [REDACTED]

I hope that you had a nice weekend.

Attached is the COC for the below job.

Thank you

From: [REDACTED]
Sent: Friday, 6 October 2017 8:50:36 AM
To: [REDACTED]
Subject: Samples received without COC

Hi [REDACTED]

I am emailing you about some samples that we have received that I believe are from you. They have the following details:

Project number: 6C543717

Sampler: ET

Sample IDs: WQAC2_031017 (water, sampled 3/1C), SQA04_041017 (soil, sampled 4/10) and WQA06_041017

Can you please confirm if these are your samples? If so, can we please have a COC for these?

Kind Regards,

[REDACTED]
Analytical Services Manager

Eurofins | mgt
2/91 Leach Hwy
KEWDALE WA 6105
AUSTRALIA
[REDACTED]

Email: [REDACTED]
Website: www.eurofins.com.au/environmental-testing<<http://www.eurofins.com.au/environmental-testing>>

Sample Receipt Advice

Company name: **AECOM Aust Pty Ltd Perth**

Contact name: [REDACTED]

Project name: **ASA LDS1**

Project ID: **60543717.1.3**

COC number: **Not provided**

Turn around time: **5 Day**

Date/Time received: **Oct 9, 2017 8:53 AM**

Eurofins | mgt reference: **566735**

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 : 4.6 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.
- N/A Sample containers for volatile analysis received with zero headspace.
- ☒ 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:

[REDACTED] on Phone : or by e.mail: [REDACTED]

Results will be delivered electronically via e.mail to [REDACTED] - [REDACTED]

Company Name: AECOM Aust Pty Ltd Perth
Address: Level 4, 3 Forrest Place
Perth
WA 6000
Project Name: ASA LDS1
Project ID: 60543717.1.3

Order No.: 60543717 1.3
Report #: 566735
Phone: 08 6208 0000
Fax:

Received: Oct 9, 2017 8:53 AM
Due: Oct 16, 2017
Priority: 5 Day
Contact Name: - ALL INVOICES

Eurofins | mgt Analytical Services Manager : XXXXXXXXXX

Sample Detail						BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									X
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
1	WQA02_031017	Oct 03, 2017		Water	P17-Oc08741	X		X	X
2	WQA06_041017	Oct 04, 2017		Water	P17-Oc08742	X		X	X
3	SQA02_041017	Oct 04, 2017		Soil	P17-Oc08743	X	X	X	X
Test Counts						3	1	3	3

Certificate of Analysis

AECOM Aust Pty Ltd Perth
Level 4, 3 Forrest Place
Perth
WA 6000



NATA Accredited
Accreditation Number 1261
Site Number 23736

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:

Report 566735-S
Project name ASA LDS1
Project ID 60543717.1.3
Received Date Oct 09, 2017

Client Sample ID			SQA02_041017
Sample Matrix			Soil
Eurofins mgt Sample No.			P17-Oc08743
Date Sampled			Oct 04, 2017
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	150
TRH C29-C36	50	mg/kg	87
TRH C10-36 (Total)	50	mg/kg	237
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	55
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.5	mg/kg	< 0.5
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	100
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
TRH >C10-C16	50	mg/kg	100
TRH >C16-C34	100	mg/kg	140
TRH >C34-C40	100	mg/kg	< 100
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA) ^{N11}	5	ug/kg	< 5
Perfluoropentanoic acid (PFPeA) ^{N11}	5	ug/kg	< 5
Perfluorohexanoic acid (PFHxA) ^{N11}	5	ug/kg	< 5
Perfluoroheptanoic acid (PFHpA) ^{N11}	5	ug/kg	< 5
Perfluorooctanoic acid (PFOA) ^{N11}	5	ug/kg	< 5
Perfluorononanoic acid (PFNA) ^{N11}	5	ug/kg	< 5
Perfluorodecanoic acid (PFDA) ^{N11}	5	ug/kg	5.9
Perfluoroundecanoic acid (PFUnA) ^{N11}	5	ug/kg	< 5
Perfluorododecanoic acid (PFDoA) ^{N11}	5	ug/kg	< 5
Perfluorotridecanoic acid (PFTeDA)	5	ug/kg	< 5
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	5	ug/kg	< 5
13C4-PFBA (surr.)	1	%	88

Client Sample ID			SQA02_041017
Sample Matrix			Soil
Eurofins mgt Sample No.			P17-Oc08743
Date Sampled			Oct 04, 2017
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
13C5-PFPeA (surr.)	1	%	92
13C5-PFHxA (surr.)	1	%	84
13C4-PFHpA (surr.)	1	%	106
13C8-PFOA (surr.)	1	%	95
13C5-PFNA (surr.)	1	%	138
13C6-PFDA (surr.)	1	%	149
13C2-PFUnDA (surr.)	1	%	101
13C2-PFDoDA (surr.)	1	%	70
13C2-PFTeDA (surr.)	1	%	125
Perfluoroalkane sulfonamides (PFASAs)			
Perfluorooctane sulfonamide (FOSA) ^{N11}	5	ug/kg	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	5	ug/kg	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	5	ug/kg	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	5	ug/kg	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	5	ug/kg	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	10	ug/kg	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	10	ug/kg	< 10
13C8-FOSA (surr.)	1	%	70
D3-N-MeFOSA (surr.)	1	%	90
D5-N-EtFOSA (surr.)	1	%	76
D7-N-MeFOSE (surr.)	1	%	107
D9-N-EtFOSE (surr.)	1	%	142
D5-N-EtFOSAA (surr.)	1	%	119
D3-N-MeFOSAA (surr.)	1	%	49
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAAs)			
Perfluorobutanesulfonic acid (PFBS) ^{N11}	5	ug/kg	< 5
Perfluoropentanesulfonic acid (PFPeS)	5	ug/kg	< 5
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	5	ug/kg	< 5
Perfluoroheptanesulfonic acid (PFHpS)	5	ug/kg	< 5
Perfluorooctanesulfonic acid (PFOS) ^{N11}	5	ug/kg	< 5
Perfluorodecanesulfonic acid (PFDS)	5	ug/kg	< 5
13C3-PFBS (surr.)	1	%	105
18O2-PFHxS (surr.)	1	%	112
13C8-PFOS (surr.)	1	%	108
n:2 Fluorotelomer sulfonic acids			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS) ^{N11}	5	ug/kg	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS) ^{N11}	10	ug/kg	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS) ^{N11}	5	ug/kg	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	5	ug/kg	< 5
13C2-4:2 FTS (surr.)	1	%	Q09INT
13C2-6:2 FTS (surr.)	1	%	182
13C2-8:2 FTS (surr.)	1	%	Q09INT

Client Sample ID			SQA02_041017
Sample Matrix			Soil
Eurofins mgt Sample No.			P17-Oc08743
Date Sampled			Oct 04, 2017
Test/Reference	LOR	Unit	
PFASs Summations			
Sum (PFHxS + PFOS)	5	ug/kg	< 5
Sum of US EPA PFAS (PFOS + PFOA)	5	ug/kg	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	5	ug/kg	< 5
Sum of WA DER PFAS (n=10)	10	ug/kg	< 10
Sum of PFASs (n=28)	50	ug/kg	< 50
% Moisture	1	%	36

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C36	Melbourne	Oct 11, 2017	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 11, 2017	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 11, 2017	14 Day
BTEX and Naphthalene			
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 11, 2017	14 Day
Per- and Polyfluorinated Alkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 12, 2017	180 Day
Perfluoroalkane sulfonamides (PFASAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 12, 2017	180 Day
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 12, 2017	180 Day
n:2 Fluorotelomer sulfonic acids - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 12, 2017	180 Day
% Moisture - Method: LTM-GEN-7080 Moisture	Melbourne	Oct 10, 2017	14 Day

Company Name: AECOM Aust Pty Ltd Perth
Address: Level 4, 3 Forrest Place
Perth
WA 6000
Project Name: ASA LDS1
Project ID: 60543717.1.3

Order No.:
Report #: 566735
Phone: 08 6208 0000
Fax:

Received: Oct 9, 2017 8:53 AM
Due: Oct 16, 2017
Priority: 5 Day
Contact Name: [REDACTED]

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail						BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									X
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
1	WQA02_031017	Oct 03, 2017		Water	P17-Oc08741	X		X	X
2	WQA06_041017	Oct 04, 2017		Water	P17-Oc08742	X		X	X
3	SQA02_041017	Oct 04, 2017		Soil	P17-Oc08743	X	X	X	X
Test Counts						3	1	3	3

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 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 Sample Receipt Advice.

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

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

****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							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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							
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 (PFUnA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTriDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkane sulfonamides (PFASAs)							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
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							
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAAs)							
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	

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5		5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5		5	Pass	
Method Blank						
n:2 Fluorotelomer sulfonic acids						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	ug/kg	< 5		5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	ug/kg	< 10		10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	ug/kg	< 5		5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	ug/kg	< 5		5	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	%	110		70-130	Pass	
TRH C10-C14	%	79		70-130	Pass	
LCS - % Recovery						
BTEX						
Benzene	%	102		70-130	Pass	
Toluene	%	105		70-130	Pass	
Ethylbenzene	%	104		70-130	Pass	
m&p-Xylenes	%	110		70-130	Pass	
Xylenes - Total	%	108		70-130	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene	%	80		70-130	Pass	
TRH C6-C10	%	101		70-130	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	%	74		70-130	Pass	
LCS - % Recovery						
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)	%	107		50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	86		50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	116		50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	93		50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	100		50-150	Pass	
Perfluorononanoic acid (PFNA)	%	107		50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	99		50-150	Pass	
Perfluoroundecanoic acid (PFUnA)	%	106		50-150	Pass	
Perfluorododecanoic acid (PFDoA)	%	96		50-150	Pass	
Perfluorotridecanoic acid (PFTriDA)	%	104		50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	134		50-150	Pass	
LCS - % Recovery						
Perfluoroalkane sulfonamides (PFASAs)						
Perfluorooctane sulfonamide (FOSA)	%	117		50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	102		50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	130		50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	107		50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	115		50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	106		50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	111		50-150	Pass	
LCS - % Recovery						
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)	%	93		50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	104		50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	115		50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	108		50-150	Pass	

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctanesulfonic acid (PFOS)				%	95			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)				%	68			50-150	Pass	
LCS - % Recovery										
n:2 Fluorotelomer sulfonic acids										
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)				%	106			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)				%	115			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)				%	126			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)				%	142			50-150	Pass	
Test	Lab Sample ID	QA Source		Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery										
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					Result 1					
TRH C6-C9	P17-Oc08743	CP	%	90				70-130	Pass	
TRH C10-C14	M17-Oc12200	NCP	%	74				70-130	Pass	
Spike - % Recovery										
BTEX					Result 1					
Benzene	P17-Oc08743	CP	%	81				70-130	Pass	
Toluene	P17-Oc08743	CP	%	83				70-130	Pass	
Ethylbenzene	P17-Oc08743	CP	%	82				70-130	Pass	
m&p-Xylenes	P17-Oc08743	CP	%	89				70-130	Pass	
o-Xylene	P17-Oc08743	CP	%	83				70-130	Pass	
Xylenes - Total	P17-Oc08743	CP	%	87				70-130	Pass	
Spike - % Recovery										
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					Result 1					
Naphthalene	P17-Oc08743	CP	%	93				70-130	Pass	
TRH C6-C10	P17-Oc08743	CP	%	98				70-130	Pass	
Spike - % Recovery										
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					Result 1					
TRH >C10-C16	M17-Oc12200	NCP	%	70				70-130	Pass	
Spike - % Recovery										
Perfluoroalkyl carboxylic acids (PFCAs)					Result 1					
Perfluorobutanoic acid (PFBA)	M17-Oc09345	NCP	%	125				50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M17-Oc09345	NCP	%	103				50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M17-Oc09345	NCP	%	138				50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M17-Oc09345	NCP	%	111				50-150	Pass	
Perfluorooctanoic acid (PFOA)	M17-Oc09345	NCP	%	116				50-150	Pass	
Perfluorononanoic acid (PFNA)	M17-Oc09345	NCP	%	124				50-150	Pass	
Perfluorodecanoic acid (PFDA)	M17-Oc09345	NCP	%	123				50-150	Pass	
Perfluoroundecanoic acid (PFUnA)	M17-Oc09345	NCP	%	127				50-150	Pass	
Perfluorododecanoic acid (PFDoA)	M17-Oc09345	NCP	%	114				50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M17-Oc09345	NCP	%	148				50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M17-Oc09345	NCP	%	138				50-150	Pass	
Spike - % Recovery										
Perfluoroalkane sulfonamides (PFASAs)					Result 1					
Perfluorooctane sulfonamide (FOSA)	M17-Oc09345	NCP	%	147				50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M17-Oc09345	NCP	%	131				50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M17-Oc09345	NCP	%	138				50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M17-Oc09345	NCP	%	132				50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M17-Oc09345	NCP	%	131				50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M17-Oc09345	NCP	%	126			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M17-Oc09345	NCP	%	128			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSA's)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M17-Oc09345	NCP	%	110			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M17-Oc09345	NCP	%	127			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M17-Oc09345	NCP	%	132			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M17-Oc09345	NCP	%	119			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M17-Oc09345	NCP	%	115			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M17-Oc09345	NCP	%	79			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	M17-Oc09345	NCP	%	116			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	M17-Oc09345	NCP	%	131			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	M17-Oc09345	NCP	%	117			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	M17-Oc09345	NCP	%	121			50-150	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	M17-Oc05935	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M17-Oc12199	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M17-Oc12199	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M17-Oc12199	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M17-Oc05935	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M17-Oc05935	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M17-Oc05935	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M17-Oc05935	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M17-Oc05935	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M17-Oc05935	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M17-Oc05935	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M17-Oc05935	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M17-Oc12199	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M17-Oc12199	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M17-Oc12199	NCP	mg/kg	< 100	< 100	<1	30%	Pass	

Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD		
Perfluorobutanoic acid (PFBA)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoropentanoic acid (PFPeA)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorohexanoic acid (PFHxA)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoroheptanoic acid (PFHpA)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorooctanoic acid (PFOA)	B17-Oc07169	NCP	ug/kg	5.4	5.4	1.0	30%	Pass
Perfluorononanoic acid (PFNA)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorodecanoic acid (PFDA)	B17-Oc07169	NCP	ug/kg	26	22	14	30%	Pass
Perfluoroundecanoic acid (PFUnA)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorododecanoic acid (PFDoA)	B17-Oc07169	NCP	ug/kg	17	14	20	30%	Pass
Perfluorotridecanoic acid (PFTTrDA)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorotetradecanoic acid (PFTeDA)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Duplicate								
Perfluoroalkane sulfonamides (PFASAs)				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B17-Oc07169	NCP	ug/kg	< 10	< 10	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B17-Oc07169	NCP	ug/kg	< 10	< 10	<1	30%	Pass
Duplicate								
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	B17-Oc07169	NCP	ug/kg	16	13	16	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Duplicate								
n:2 Fluorotelomer sulfonic acids				Result 1	Result 2	RPD		
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	B17-Oc07169	NCP	ug/kg	< 10	< 10	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	B17-Oc07169	NCP	ug/kg	< 5	< 5	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	M17-Oc08805	NCP	%	2.2	2.3	5.0	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	N/A
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.
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. 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).
Q09	The Surrogate recovery is outside of the recommended acceptance criteria due to matrix interference. Acceptance criteria were met for all other QC

Authorised By

	Analytical Services Manager
	Senior Analyst-Metal (VIC)
	Senior Analyst-Organic (VIC)
	Senior Analyst-Volatile (VIC)
	Senior Analyst-Inorganic (VIC)
	Senior Analyst-Organic (QLD)
	Senior Analyst-Organic (VIC)



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](#).

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Certificate of Analysis

AECOM Aust Pty Ltd Perth
Level 4, 3 Forrest Place
Perth
WA 6000



NATA Accredited
Accreditation Number 1261
Site Number 23736

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:

Report 566796-W
Project name PERTH AIRPORT LDS1
Project ID 60543717
Received Date Oct 09, 2017

Client Sample ID			WQA17_091017
Sample Matrix			Water
Eurofins mgt Sample No.			P17-Oc09278
Date Sampled			Oct 09, 2017
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	93
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.01	mg/L	< 0.01
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA) ^{N11}	0.05	ug/L	< 0.05
Perfluoropentanoic acid (PFPeA) ^{N11}	0.01	ug/L	^{N09} 0.02
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	^{N09} 0.03
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	^{N09} 0.01
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	^{N09} 0.03
Perfluorononanoic acid (PFNA) ^{N11}	0.01	ug/L	< 0.01
Perfluorodecanoic acid (PFDA) ^{N11}	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnA) ^{N11}	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoA) ^{N11}	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTTrDA)	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.01	ug/L	< 0.01

Client Sample ID			WQA17_091017
Sample Matrix			Water
Eurofins mgt Sample No.			P17-Oc09278
Date Sampled			Oct 09, 2017
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
13C4-PFBA (surr.)	1	%	71
13C5-PFPeA (surr.)	1	%	109
13C5-PFHxA (surr.)	1	%	168
13C4-PFHpA (surr.)	1	%	129
13C8-PFOA (surr.)	1	%	139
13C5-PFNA (surr.)	1	%	139
13C6-PFDA (surr.)	1	%	116
13C2-PFUnDA (surr.)	1	%	84
13C2-PFDoDA (surr.)	1	%	83
13C2-PFTeDA (surr.)	1	%	38
Perfluoroalkane sulfonamides (PFASAs)			
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	78
D3-N-MeFOSA (surr.)	1	%	54
D5-N-EtFOSA (surr.)	1	%	57
D7-N-MeFOSE (surr.)	1	%	67
D9-N-EtFOSE (surr.)	1	%	52
D5-N-EtFOSAA (surr.)	1	%	59
D3-N-MeFOSAA (surr.)	1	%	83
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAAs)			
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	^{N09} 0.02
Perfluoropentanesulfonic acid (PFPeS)	0.01	ug/L	^{N09} 0.02
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.01	ug/L	^{N09} 0.19
Perfluoroheptanesulfonic acid (PFHpS)	0.01	ug/L	^{N09} 0.02
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	^{N09} 0.20
Perfluorodecanesulfonic acid (PFDS)	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	150
18O2-PFHxS (surr.)	1	%	125
13C8-PFOS (surr.)	1	%	91
n:2 Fluorotelomer sulfonic acids			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS) ^{N11}	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS) ^{N11}	0.05	ug/L	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS) ^{N11}	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	0.01	ug/L	< 0.01
13C2-4:2 FTS (surr.)	1	%	^{Q09} INT
13C2-6:2 FTS (surr.)	1	%	151
13C2-8:2 FTS (surr.)	1	%	104

Client Sample ID			WQA17_091017
Sample Matrix			Water
Eurofins mgt Sample No.			P17-Oc09278
Date Sampled			Oct 09, 2017
Test/Reference	LOR	Unit	
PFASs Summations			
Sum (PFHxS + PFOS)	0.01	ug/L	0.39
Sum of US EPA PFAS (PFOS + PFOA)	0.01	ug/L	0.23
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	0.01	ug/L	0.42
Sum of WA DER PFAS (n=10)	0.05	ug/L	0.5
Sum of PFASs (n=28)	0.1	ug/L	0.54

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C36	Melbourne	Oct 12, 2017	7 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 10, 2017	7 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 12, 2017	7 Day
BTEX and Naphthalene			
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 10, 2017	14 Day
Per- and Polyfluorinated Alkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 12, 2017	14 Day
Perfluoroalkane sulfonamides (PFASAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 12, 2017	14 Day
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 12, 2017	14 Day
n:2 Fluorotelomer sulfonic acids - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 12, 2017	14 Day

Company Name: AECOM Aust Pty Ltd Perth
Address: Level 4, 3 Forrest Place
Perth
WA 6000
Project Name: PERTH AIRPORT LDS1
Project ID: 60543717

Order No.: 60543717.1.3
Report #: 566796
Phone: 08 6208 0000
Fax:

Received: Oct 9, 2017 5:08 PM
Due: Oct 16, 2017
Priority: 5 Day
Contact Name: [REDACTED]

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail						BTEX and Naphthalene	Total Recoverable Hydrocarbons	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	WQA17_091017	Oct 09, 2017		Water	P17-Oc09278	X	X	X
Test Counts						1	1	1

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 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 Sample Receipt Advice.

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

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

****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							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
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 (PFUnA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTriDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkane sulfonamides (PFASAs)							
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							
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAAs)							
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	92			70-130	Pass	
TRH C10-C14	%	110			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	96			70-130	Pass	
Toluene	%	95			70-130	Pass	
Ethylbenzene	%	81			70-130	Pass	
m&p-Xylenes	%	85			70-130	Pass	
Xylenes - Total	%	84			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	129			70-130	Pass	
TRH C6-C10	%	91			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	118			70-130	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	130			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	111			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	92			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	117			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	121			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	127			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	110			50-150	Pass	
Perfluoroundecanoic acid (PFUnA)	%	122			50-150	Pass	
Perfluorododecanoic acid (PFDoA)	%	104			50-150	Pass	
Perfluorotridecanoic acid (PFTriDA)	%	136			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	112			50-150	Pass	
LCS - % Recovery							
Perfluoroalkane sulfonamides (PFASAs)							
Perfluorooctane sulfonamide (FOSA)	%	106			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	128			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	120			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	132			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	123			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	128			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	126			50-150	Pass	
LCS - % Recovery							
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	91			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	107			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	98			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	97			50-150	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctanesulfonic acid (PFOS)			%	116			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)			%	119			50-150	Pass	
LCS - % Recovery									
n:2 Fluorotelomer sulfonic acids									
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)			%	111			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)			%	129			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)			%	124			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)			%	112			50-150	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	M17-Oc10129	NCP	%	106			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M17-Oc10129	NCP	%	86			70-130	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B17-Oc05645	NCP	%	145			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B17-Oc05645	NCP	%	124			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B17-Oc05645	NCP	%	100			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B17-Oc05645	NCP	%	123			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B17-Oc05645	NCP	%	138			50-150	Pass	
Perfluorononanoic acid (PFNA)	B17-Oc05645	NCP	%	132			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B17-Oc05645	NCP	%	115			50-150	Pass	
Perfluoroundecanoic acid (PFUnA)	B17-Oc05645	NCP	%	127			50-150	Pass	
Perfluorododecanoic acid (PFDoA)	B17-Oc05645	NCP	%	123			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B17-Oc05645	NCP	%	134			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B17-Oc05645	NCP	%	123			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonamides (PFASAs)				Result 1					
Perfluorooctane sulfonamide (FOSA)	B17-Oc05645	NCP	%	119			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B17-Oc05645	NCP	%	131			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B17-Oc05645	NCP	%	106			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B17-Oc05645	NCP	%	138			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B17-Oc05645	NCP	%	132			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B17-Oc05645	NCP	%	135			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B17-Oc05645	NCP	%	116			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B17-Oc05645	NCP	%	93			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B17-Oc05645	NCP	%	96			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B17-Oc05645	NCP	%	109			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B17-Oc05645	NCP	%	119			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctanesulfonic acid (PFOS)	B17-Oc05645	NCP	%	121			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B17-Oc05645	NCP	%	136			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	B17-Oc05645	NCP	%	114			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	B17-Oc05645	NCP	%	142			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	B17-Oc05645	NCP	%	126			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	B17-Oc05645	NCP	%	115			50-150	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	M17-Oc05657	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M17-Oc10128	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M17-Oc10128	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M17-Oc10128	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M17-Oc05657	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M17-Oc05657	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M17-Oc05657	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M17-Oc05657	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M17-Oc05657	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M17-Oc05657	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M17-Oc05657	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M17-Oc05657	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M17-Oc10128	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M17-Oc10128	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M17-Oc10128	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTTrDA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate								
Perfluoroalkane sulfonamides (PFASAs)				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
n:2 Fluorotelomer sulfonic acids				Result 1	Result 2	RPD		
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	B17-Oc05644	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	B17-Oc05644	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
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.
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. 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).
Q09	The Surrogate recovery is outside of the recommended acceptance criteria due to matrix interference. Acceptance criteria were met for all other QC

Authorised By

	Analytical Services Manager
	Senior Analyst-Organic (VIC)
	Senior Analyst-Volatile (VIC)
	Senior Analyst-Organic (QLD)
	Senior Analyst-Organic (VIC)



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

☐ **Melbourne**
2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: EnviroSampleVic@eurofins.com.au

CLIENT DETAILS

Page 1 of 1

COC Number :

Eurofins | mgt quote ID : URS Rates

Data output format:

APPENDICES

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Eurofins | mgt DI water batch number:

[illegible]

Relinquished By: [Redacted]	Received By: [Redacted]	Laboratory Staff	Turn around time	Method Of Shipment	Temperature on arrival:
Date & Time: 3:00 9/10/17	Date: 09/10/17		1 DAY ☐ 2 DAY ☐ 3 DAY ☐ 5 DAY ☐ 10 DAY ☐ Other:	☐ Courier ☐ Hand Delivered ☐ Postal Courier Consignment #:	Report number: 566796
Signature: [Redacted]	Signature: [Redacted]				

Sample Receipt Advice

Company name: **AECOM Aust Pty Ltd Perth**

Contact name: [REDACTED]

Project name: **PERTH AIRPORT LDS1**

Project ID: **60543717**

COC number: **Not provided**

Turn around time: **5 Day**

Date/Time received: **Oct 9, 2017 5:08 PM**

Eurofins | mgt reference: **566796**

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 : 15.4 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.
- N/A Sample containers for volatile analysis received with zero headspace.
- ☒ 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:

[REDACTED] on Phone : or by e.mail: [REDACTED]

Results will be delivered electronically via e.mail to [REDACTED] - [REDACTED].

Certificate of Analysis

AECOM Aust Pty Ltd Perth
Level 4, 3 Forrest Place
Perth
WA 6000



NATA Accredited
Accreditation Number 1261
Site Number 23736

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:

Report 568454-W
Project name PERTH AIRPORT LIMITED DS
Project ID 60543717.1.3
Received Date Oct 19, 2017

Client Sample ID			WQA02_171017	WQA08_181017
Sample Matrix			Water	Water
Eurofins mgt Sample No.			P17-Oc22200	P17-Oc22201
Date Sampled			Oct 17, 2017	Oct 17, 2017
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1	< 0.1
BTEX				
Benzene	0.001	mg/L	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	121	150
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1
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	^{N09} 0.01
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	< 0.01	^{N09} 0.09
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	< 0.01	^{N09} < 0.01
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	< 0.01	0.02
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 (PFUnA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTTrDA)	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01

Client Sample ID			WQA02_17101 7	WQA08_18101 7
Sample Matrix			Water	Water
Eurofins mgt Sample No.			P17-Oc22200	P17-Oc22201
Date Sampled			Oct 17, 2017	Oct 17, 2017
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
13C4-PFBA (surr.)	1	%	74	64
13C5-PFPeA (surr.)	1	%	90	44
13C5-PFHxA (surr.)	1	%	87	72
13C4-PFHpA (surr.)	1	%	88	79
13C8-PFOA (surr.)	1	%	87	71
13C5-PFNA (surr.)	1	%	72	61
13C6-PFDA (surr.)	1	%	67	48
13C2-PFUnDA (surr.)	1	%	61	50
13C2-PFDoDA (surr.)	1	%	51	43
13C2-PFTeDA (surr.)	1	%	41	26
Perfluoroalkane sulfonamides (PFASAs)				
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	%	76	35
D3-N-MeFOSA (surr.)	1	%	41	25
D5-N-EtFOSA (surr.)	1	%	36	22
D7-N-MeFOSE (surr.)	1	%	43	27
D9-N-EtFOSE (surr.)	1	%	38	23
D5-N-EtFOSAA (surr.)	1	%	50	33
D3-N-MeFOSAA (surr.)	1	%	53	37
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAAs)				
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	0.02	0.05
Perfluoropentanesulfonic acid (PFPeS)	0.01	ug/L	^{N09} 0.02	^{N09} 0.08
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.01	ug/L	^{N09} 0.18	^{N09} 0.85
Perfluoroheptanesulfonic acid (PFHpS)	0.01	ug/L	< 0.01	^{N09} 0.03
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	^{N09} 0.08	^{N09} 2.2
Perfluorodecanesulfonic acid (PFDS)	0.01	ug/L	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	85	82
18O2-PFHxS (surr.)	1	%	83	61
13C8-PFOS (surr.)	1	%	73	67
n:2 Fluorotelomer sulfonic acids				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS) ^{N11}	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS) ^{N11}	0.05	ug/L	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS) ^{N11}	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTS (surr.)	1	%	94	77
13C2-6:2 FTS (surr.)	1	%	87	63
13C2-8:2 FTS (surr.)	1	%	56	43

Client Sample ID			WQA02_171017	WQA08_181017
Sample Matrix			Water	Water
Eurofins mgt Sample No.			P17-Oc22200	P17-Oc22201
Date Sampled			Oct 17, 2017	Oct 17, 2017
Test/Reference	LOR	Unit		
PFASs Summations				
Sum (PFHxS + PFOS)	0.01	ug/L	0.26	3.05
Sum of US EPA PFAS (PFOS + PFOA)	0.01	ug/L	0.08	2.22
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	0.01	ug/L	0.26	3.07
Sum of WA DER PFAS (n=10)	0.05	ug/L	0.28	3.22
Sum of PFASs (n=28)	0.1	ug/L	0.3	3.33

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C36	Melbourne	Oct 23, 2017	7 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 20, 2017	7 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 23, 2017	7 Day
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Melbourne	Oct 20, 2017	14 Day
Per- and Polyfluorinated Alkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 19, 2017	14 Day
Perfluoroalkane sulfonamides (PFASAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 19, 2017	14 Day
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs) - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 19, 2017	14 Day
n:2 Fluorotelomer sulfonic acids - Method: LTM-ORG-2100 Per- and Polyfluorinated Alkyl Substances by LC-MS/MS	Brisbane	Oct 19, 2017	14 Day

Company Name: AECOM Aust Pty Ltd Perth
Address: Level 4, 3 Forrest Place
Perth
WA 6000
Project Name: PERTH AIRPORT LIMITED DS
Project ID: 60543717.1.3

Order No.: 60543717.1.3
Report #: 568454
Phone: 08 6208 0000
Fax:

Received: Oct 19, 2017 10:36 AM
Due: Oct 26, 2017
Priority: 5 Day
Contact Name: [REDACTED]

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail						BTEX	Total Recoverable Hydrocarbons	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	WQA02_171017	Oct 17, 2017		Water	P17-Oc22200	X	X	X
2	WQA08_181017	Oct 17, 2017		Water	P17-Oc22201	X	X	X
Test Counts						2	2	2

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 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 Sample Receipt Advice.

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

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

****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							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
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 (PFUnA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTriDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkane sulfonamides (PFASAs)							
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							
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAAs)							
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	99			70-130	Pass	
TRH C10-C14	%	117			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	110			70-130	Pass	
Toluene	%	107			70-130	Pass	
Ethylbenzene	%	100			70-130	Pass	
m&p-Xylenes	%	108			70-130	Pass	
Xylenes - Total	%	107			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	100			70-130	Pass	
TRH C6-C10	%	97			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	130			70-130	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	109			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	101			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	105			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	107			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	109			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	106			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	106			50-150	Pass	
Perfluoroundecanoic acid (PFUnA)	%	102			50-150	Pass	
Perfluorododecanoic acid (PFDoA)	%	110			50-150	Pass	
Perfluorotridecanoic acid (PFTriDA)	%	76			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	108			50-150	Pass	
LCS - % Recovery							
Perfluoroalkane sulfonamides (PFASAs)							
Perfluorooctane sulfonamide (FOSA)	%	101			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	71			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	54			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	99			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	82			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	102			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	107			50-150	Pass	
LCS - % Recovery							
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	101			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	101			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	100			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	104			50-150	Pass	

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctanesulfonic acid (PFOS)				%	103			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)				%	94			50-150	Pass	
LCS - % Recovery										
n:2 Fluorotelomer sulfonic acids										
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)				%	100			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)				%	103			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)				%	94			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)				%	88			50-150	Pass	
Test	Lab Sample ID	QA Source		Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery										
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					Result 1					
TRH C6-C9	M17-Oc22658	NCP	%	86				70-130	Pass	
TRH C10-C14	M17-Oc24829	NCP	%	74				70-130	Pass	
Spike - % Recovery										
BTEX					Result 1					
Benzene	M17-Oc22658	NCP	%	99				70-130	Pass	
Toluene	M17-Oc22658	NCP	%	87				70-130	Pass	
Ethylbenzene	M17-Oc22658	NCP	%	102				70-130	Pass	
m&p-Xylenes	M17-Oc22658	NCP	%	109				70-130	Pass	
o-Xylene	M17-Oc22658	NCP	%	118				70-130	Pass	
Xylenes - Total	M17-Oc22658	NCP	%	112				70-130	Pass	
Spike - % Recovery										
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					Result 1					
Naphthalene	M17-Oc22658	NCP	%	83				70-130	Pass	
TRH C6-C10	M17-Oc22658	NCP	%	83				70-130	Pass	
Spike - % Recovery										
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					Result 1					
TRH >C10-C16	M17-Oc24829	NCP	%	82				70-130	Pass	
Spike - % Recovery										
Perfluoroalkyl carboxylic acids (PFCAs)					Result 1					
Perfluorobutanoic acid (PFBA)	B17-Oc19368	NCP	%	121				50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B17-Oc19368	NCP	%	116				50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B17-Oc19368	NCP	%	118				50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B17-Oc19368	NCP	%	122				50-150	Pass	
Perfluorooctanoic acid (PFOA)	B17-Oc19368	NCP	%	120				50-150	Pass	
Perfluorononanoic acid (PFNA)	B17-Oc19368	NCP	%	117				50-150	Pass	
Perfluorodecanoic acid (PFDA)	B17-Oc19368	NCP	%	119				50-150	Pass	
Perfluoroundecanoic acid (PFUnA)	B17-Oc19368	NCP	%	114				50-150	Pass	
Perfluorododecanoic acid (PFDoA)	B17-Oc19368	NCP	%	118				50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B17-Oc19368	NCP	%	100				50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B17-Oc19368	NCP	%	120				50-150	Pass	
Spike - % Recovery										
Perfluoroalkane sulfonamides (PFASAs)					Result 1					
Perfluorooctane sulfonamide (FOSA)	B17-Oc19368	NCP	%	115				50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B17-Oc19368	NCP	%	109				50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B17-Oc19368	NCP	%	54				50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B17-Oc19368	NCP	%	103				50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B17-Oc19368	NCP	%	108				50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B17-Oc19368	NCP	%	110			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B17-Oc19368	NCP	%	114			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSA's)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B17-Oc19368	NCP	%	114			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B17-Oc19368	NCP	%	117			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B17-Oc19368	NCP	%	111			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B17-Oc19368	NCP	%	119			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B17-Oc19368	NCP	%	113			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B17-Oc19368	NCP	%	87			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	B17-Oc19368	NCP	%	116			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	B17-Oc19368	NCP	%	113			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	B17-Oc19368	NCP	%	107			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	B17-Oc19368	NCP	%	97			50-150	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	M17-Oc22659	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M17-Oc24827	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M17-Oc24827	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M17-Oc24827	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M17-Oc22659	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M17-Oc22659	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M17-Oc22659	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M17-Oc22659	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M17-Oc22659	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M17-Oc22659	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M17-Oc22659	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M17-Oc22659	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M17-Oc24827	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M17-Oc24827	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M17-Oc24827	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD		
Perfluorobutanoic acid (PFBA)	B17-Oc18788	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Perfluoropentanoic acid (PFPeA)	B17-Oc18788	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanoic acid (PFHxA)	B17-Oc18788	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroheptanoic acid (PFHpA)	B17-Oc18788	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanoic acid (PFOA)	B17-Oc18788	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorononanoic acid (PFNA)	B17-Oc18788	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorodecanoic acid (PFDA)	B17-Oc18788	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroundecanoic acid (PFUnA)	B17-Oc18788	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorododecanoic acid (PFDoA)	B17-Oc18788	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotridecanoic acid (PFTrDA)	B17-Oc18788	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotetradecanoic acid (PFTeDA)	B17-Oc18788	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
Perfluoroalkane sulfonamides (PFASAs)				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	B17-Oc18788	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B17-Oc18788	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B17-Oc18788	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B17-Oc18788	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B17-Oc18788	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B17-Oc18788	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B17-Oc18788	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
Perfluoroalkane sulfonic acids & Perfluoroalkane sulfonates (PFSAs)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	B17-Oc18788	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	B17-Oc18788	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	B17-Oc18788	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	B17-Oc18788	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	B17-Oc18788	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	B17-Oc18788	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
n:2 Fluorotelomer sulfonic acids				Result 1	Result 2	RPD		
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS)	B17-Oc18788	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	B17-Oc18788	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	B17-Oc18788	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTS)	B17-Oc18788	NCP	ug/L	< 0.01	< 0.01	<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.
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. 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

	Analytical Services Manager
	Senior Analyst-Organic (VIC)
	Senior Analyst-Volatile (VIC)
	Senior Analyst-Organic (QLD)
	Senior Analyst-Organic (VIC)



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](#).

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[illegible]

Sample Receipt Advice

Company name: **AECOM Aust Pty Ltd Perth**

Contact name: [REDACTED]

Project name: **PERTH AIRPORT LIMITED DS**

Project ID: **60543717.1.3**

COC number: **Not provided**

Turn around time: **5 Day**

Date/Time received: **Oct 19, 2017 10:36 AM**

Eurofins | mgt reference: **568454**

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 : 11.1 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:

[REDACTED] on Phone : or by e.mail: [REDACTED]

Results will be delivered electronically via e.mail to [REDACTED] - [REDACTED]

Appendix N

Field Parameters

FQM-5.05-F1 – GROUNDWATER SAMPLING AND PURGING RECORD

MW1701
(APEC 6)

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Project Name:		Perth Airport LSI		Project Number:		60543717		PM Name:		Sample Date:		8.11.17 (MW1702)															
Client:		Airservices Australia		Project Location:		Perth Airport		Fieldwork Staff:		Well Development or Well Sampling Event? (circle)																	
General Bore Information				Parameter Info.				Decontamination		Sampling method		Hydrasleeve info.															
Date of GW Level:		8.11.17		Bore Radius (mm):		50		Chem Kit Serial No.:		154103057		Monitoring sequence followed (number in order):															
Depth to GW (m-pvc):		1.985		Screen Interval (m):		1-4m		Chem Kit Model:		YSI Pro Series		Gauging															
Bore Depth (m-pvc):		4.45		Casing Radius (mm):				Corrected Redox:		(Y) / N		Hydrasleeve in															
Depth to Product (m-pvc):				Cover Type (gatic stick up):				(The correction to apply is probe dependent)		Other (specify)		Hydrasleeve out															
Product Thickness (m):				Bore Locked (YES/NO):		NO		Parameter method:		Downhole		Parameters															
				Key Type (if applicable):				Retrieved																			
Calculated bore volume (L):				Includes/ excludes bore annulus (circle)				# purge volumes removed:				Total purged volume (L):															
Water Quality Parameters																											
Time		Cumulative Vol. Removed (L)		SWL (m-pvc)		Pump Rate		DO (ppm or mg/L)		5. E.C. (mS/cm or µS/cm)		pH		Redox (mV)		Temp °C		Odour, Colour, Turbidity									
11:13		0		1.98		0.1		0.25		446		5.60		1.1		21.4		Brown, medium turbidity, no odour.									
11:16		0.3		1.98		0.1		0.39		445		5.55		-0.2		22.4											
11:19		0.6		1.98		0.1		0.96		454		5.53		1.9		22.0											
11:24		0.9		1.98		0.1		1.02		454		5.53		2.1		22.0											
		1.2																									
Acceptable Parameter Range:																± 10%		± 3%		± 0.05		± 10 mV		± 0.2 °C		± 10% turbidity (if using a turbidity meter)	
Analytes Sampled for:				Bottles Collected								QA/QC Information				Field Comments											
Field Filtered:		Unfiltered:		x 40 mL Vial (HCl)		x 40 mL Vial (H ₂ SO ₄)		x 60 mL Ferrous		x 60 mL metals (HNO ₃)		Nil		Bore volume calculation, bore condition, fate of tubing, redox correction etc.													
Nil		TRH/BTEX		3		1		x 100 mL Amber		x 250 mL Plastic				Previous Gauging on 19/10/17 GW at 1.836 mbgl.													
PFAS								1 x 60mL PFAS																			
Approval and Distribution																											
Fieldwork Staff Signature				8.11.17				Date				Checker Name and Signature				Date											
Project Manager Signature				8.11.17				Date				Distribution: Project Central File															

ONW

Bore ID: MW17083
APEC

Project Name:	Perth Airport Limited DSI	Project Number:	60543717.1.3	PM Name:		Sample Date:	18-10-17
Client:	Air Services Australia Pty Ltd	Project Location:	APEC 3B	Fieldwork Staff:		Well Development or Well Sampling Event? (circle)	

GENERAL BORE INFORMATION		PARAMETER INFO.		DECONTAMINATION	SAMPLING METHOD:	HYDRASLEEVE INFO.	
Date of GW Level: 12-10-17	Bore Radius (mm):	Chem Kit Serial No.: 15K100324	☒ Decontaminated	Low Flow: Pump rate: 0.7 L/min Intake depth: 2.5	Hydrasleeve Size:	Monitoring sequence followed (number in order):	
Depth to GW (m-pvc): 2.077	Screen Interval (m):	Chem Kit Model: 481 PRO PLUS	☒ Dedicated		Hydrasleeve Type:		
Bore Depth (m-pvc): 450	Casing Radius (mm):	Corrected Redox: Y / N	☒ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	Gauging	
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☒ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	Hydrasleeve in	
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole ☒ Retrieved		☐ Other (specify)	Sampling Start Time:	Hydrasleeve out	
	Key Type (if applicable):						Parameters
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:	Total purged volume (L): 1.102				

[illegible]

ANALYTES SAMPLED FOR:		BOTTLES COLLECTED			QA/QC INFORMATION	FIELD COMMENTS
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)	WQA07 - DUP	Bore volume calculation, bore condition, fate of tubing, redox correction etc.
		6 x 40 mL Vial (H ₂ SO ₄)	3 x 100 mL Amber	3 x 250 mL Plastic	WQA08 - TRIP	

 Fieldwork Staff Signature	18-10-17 Date	_____ Checker Name and Signature	_____ Date
 Project Manager Signature	8-11-17 Date	Distribution: Project Central File	

[illegible]

FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

[illegible]

FQM - Groundwater Sampling and Purging Record

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MW29 CAPECI Q4AN

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FQM - Groundwater Sampling and Purging Record (Q4AN(EV)-405-FM1)
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FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

Project Name:		PAPL Perth Airport		Project Number:		60543717		PM Name:				Sample Date:		9-10-17			
Client:		ASA		Project Location:		APEC1		Fieldwork Staff:				Well Development or Well Sampling Event? (circle)					
General Bore Information				Parameter Info.				Decontamination		Sampling Method			Hydrasleeve info.				
Date of GW Level:		9-10-17		Bore Radius (mm):		50		Chem Kit Serial No.:		☒ Decontaminated ☐ Dedicated		Low Flow Pump rate:		Intake depth: 2.1		Monitoring sequence followed (number in order):	
Depth to GW (m-pvc):		1.627		Screen Interval (m):		N/A		Chem Kit Model:		IK100321		☒ Disposable		☐ Bailer ☐ Hydrasleeve		Gauging	
Bore Depth (m-pvc):		-		Casing Radius (mm):		100		Corrected Redox:		Y / N		☒ Peristaltic Pump ☐ Waterra		Hydrasleeve Size:		Hydrasleeve Type:	
Depth to Product (m-pvc):		-		Cover Type (catic/stick up):		(The correction to apply is probe dependent)		Parameter method:		☐ Downhole ☒ Retrieved		☐ Other (specify)		Sampling Depth (m-pvc):		Hydrasleeve Install time:	
Product Thickness (m):		-		Bore Locked (YES/NO):		NO		Key Type (if applicable):				☐ Other (specify)		Sampling Start Time:		Parameters	
Calculated bore volume (L): -				Includes/excludes bore annulus (circle) -				# purge volumes removed: -				Total purged volume (L): 3 L					
Water Quality Parameters																	
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity								
1350	0.10	1.877	MIN	0.40	1115	7.31	-63.0	23.9	MURKY BRACKISH @ 40cm								
1352	0.40	1.852	"	0.42	1108	7.32	-58.1	24.4									
1354	0.90	1.844	"	0.37	1107	7.32	-55.5	24.7									
1357	1.70	"	"	0.34	1116	7.32	-54.3	24.5									
1358	2.00	"	"	0.33	1116	7.32	-53.8	24.7									
1400	2.20	"	" (0.9 L/min)	0.33	1114	7.32	-54.1	24.7	TRANSPARENT, COLOURLESS, ODOURLESS								
Acceptable Parameter Range:				± 10%		± 3%		± 0.05		± 10 mV		± 0.2 °C		± 10% turbidity (if using a turbidity meter)			
Analytes Sampled for:			Bottles Collected						QA/QC Information		Field Comments						
Field Filtered:		Unfiltered:		x 40 mL Vial (HCl)		x 60 mL Ferrous		x 60 mL metals (HNO ₃)		extra ambient		Bore volume calculation, bore condition, fate of tubing, redox correction etc. PID = 0.0 TBW 907 = WQA20_091017					
		x 40 mL Vial (H ₂ SO ₄)		x 100 mL Amber		x 250 mL Plastic											
Approval and Distribution																	
Fieldwork Staff Signature			Date			Checker Name and Signature			Date								
Project Manager Signature			Date			Distribution: Project Central File											

FQM - Groundwater Sampling and Purging Record

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Q4AN(EV)-405-FM1
MW35 (APEC1)

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Q4AN(EV)-405-FM1

MW37 (ARCI)

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FQM - Groundwater Sampling and Purging Record

Project Name: PAPL Perth Airport		Project Number: 60543717		PM Name: [REDACTED]		Sample Date: MW0220 (APEC2)			
Client: ASA		Project Location: APEC2		Fieldwork Staff: [REDACTED]		Well Development or Well Sampling Event? (circle)			
General Bore Information				Parameter Info.		Decontamination			
Date of GW Level: 6-10-17		Bore Radius (mm): 50		Chem Kit Serial No.:		☒ Decontaminated			
Depth to GW (m-pvc): 0.895		Screen Interval (m): N/A		Chem Kit Model: 451 PRO		☒ Dedicated			
Bore Depth (m-pvc): 4.40		Casing Radius (mm): 100		Corrected Redox: Y / N		☐ Disposable			
Depth to Product (m-pvc):		Cover Type (gatic/stick up):		(The correction to apply is probe dependent)		☐ Other (specify)			
Product Thickness (m):		Bore Locked (YES/NO):		Parameter method: ☐ Downhole		☐ Other (specify)			
		Key Type (if applicable):		☒ Retrieved					
Calculated bore volume (L):		Includes/ excludes bore annulus (circle):		# purge volumes removed:		Total purged volume (L): 1.6 L			
Water Quality Parameters									
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or μ S/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
0900	0.10	0.954	25%	3.79	503.4	8.24	-92.1	22.8	
0902	0.40	0.941	MIN	2.84	1175	7.84	-150.4	22.7	
0904	0.90	0.941	"	1.12	1502	7.68	-188.4	22.7	
0906	1.20	0.941	"	0.54	1515	7.69	-189.4	22.4	
0908	1.50	"	"	0.45	1313	7.73	-175.5	22.5	
0910	1.90	"	"	1.03	1258	7.76	-114.6	22.8	
0912	2.10	"	"	0.92	1438	7.74	-105.4	22.8	BROWN, ODORLESS, HIGH TURBIDITY
0914	2.50	"	"	0.44	1534	7.73	-104.8	22.8	SLIGHT SULFUR ODOR
0916	2.80	"	"	0.38	1540	7.73	-106.7	22.8	
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)
Analytes Sampled for:		Bottles Collected				QA/QC Information		Field Comments	
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)			Bore volume calculation, bore condition, fate of tubing, redox correction etc.		
		x 40 mL Vial (H ₂ SO ₄)	x 100 mL Amber	x 250 mL Plastic					
Approval and Distribution									
Fieldwork Staff Signature		Date		Checker Name and Signature		Date			
Project Manager Signature		Date		Distribution: Project Central File					

FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

Project Name: PAPL Perth Airport		Project Number: 60543717		PM Name: [REDACTED]		Sample Date: MWD 221			
Client: ASA		Project Location: APEC 2		Fieldwork Staff: [REDACTED]		Well Development or Well Sampling Event? (circle)			
General Bore Information				Parameter Info.		Decontamination			
Date of GW Level: 6-10-17		Bore Radius (mm):		Chem Kit Serial No.:		☒ Decontaminated			
Depth to GW (m-pvc): 1.498		Screen Interval (m):		Chem Kit Model: 45 PRO 1		☒ Dedicated			
Bore Depth (m-pvc): 4.40		Casing Radius (mm):		Corrected Redox: Y / N		☒ Disposable			
Depth to Product (m-pvc):		Cover Type (gate/stick up):		(The correction to apply is probe dependent)		☐ Other (specify)			
Product Thickness (m):		Bore Locked (YES/NO):		Parameter method: ☐ Downhole		☒ Peristaltic Pump ☐ Waterra			
		Key Type (if applicable):		☒ Retrieved		☐ Other (specify)			
Calculated bore volume (L):		Includes/ excludes bore annulus (circle)		# purge volumes removed:		Total purged volume (L): 7.0			
Water Quality Parameters									
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or μ S/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
0831	0.10	1.502	25.1	0.47	178.8	5.87	-154.8	23.1	ODOURLESS
0833	0.40	1.502	"	0.30	146.4	5.84	-156.4	22.8	
0835	0.90	1.502	"	0.30	140.7	5.83	-159.2	23.1	
0837	1.10	"	"	0.28	138.8	5.83	-161.0	23.2	
0839	1.50	"	"	0.26	137.5	5.82	-162.6	23.3	
0841	2.00	"	"	0.27	136.8	5.82	-164.1	23.3	SULFUR ODOUR, YELLOW, TRANSPARENT
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)
Analytes Sampled for:		Bottles Collected				QA/QC Information		Field Comments	
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl) x 40 mL Vial (H ₂ SO ₄) x 60 mL Ferrous x 100 mL Amber x 60 mL metals (HNO ₃) x 250 mL Plastic				Extra amber		Bore volume calculation, bore condition, fate of tubing, redox correction etc.	
Fieldwork Staff Signature: [Signature]		Date: 6-10-17		Checker Name and Signature		Date		PID = 0.0	
Project Manager Signature: [Signature]		Date: 8-11-17		Distribution: Project Central File					

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FQM - Groundwater Sampling and Purging Record

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FQM - Groundwater Sampling and Purging Record

MWF TEG-3 (Kerosene bore)
(Krishna's no 3)

Project Name: PAPL Perth Airport		Project Number: 60543717		PM Name: [REDACTED]		Sample Date: 4-10-17	
Client: ASA		Project Location: FTG		Fieldwork Staff: [REDACTED]		Well Development or Well Sampling Event? (circle)	

General Bore Information				Parameter Info.		Decontamination		Sampling Method		Hydrasleeve Info.	
Date of GW Level: 4-10-17	Bore Radius (mm):	Chem Kit Serial No.:	☒ Decontaminated	☒ Low Flow Pump rate: 0.1 L/min	Hydrasleeve Size:	Monitoring sequence followed (number in order):					
Depth to GW (m-pvc): 3.406	Screen Interval (m):	Chem Kit Model:	☒ Dedicated	Intake depth: 4.06	Hydrasleeve Type:						
Bore Depth (m-pvc): 8.750	Casing Radius (mm):	Corrected Redox: Y / N	☒ Disposable	☒ Bailer	☒ Hydrasleeve						
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☒ Other (specify)	☒ Peristaltic Pump	☒ Waterra						
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☒ Downhole	☒ Other (specify)	☒ Other (specify)							
Key Type (if applicable):		☒ Retrieved			Sampling Start Time:		Hydrasleeve out				
Calculated bore volume (L):		Includes/ excludes bore annulus (circle)	# purge volumes removed:	Total purged volume (L): 1.66		Parameters					

Water Quality Parameters									
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
1503	0.10	3.670	25%	0.60	5211	6.19	48.1	20.2	21A:OT ANAM
1505	0.20	3.824	min	0.75	5209	6.18	61.6	20.8	
1507	0.90	3.908	"	0.82	5211	6.18	58.7	20.7	
1509	1.00	3.910	"	2.86	5126	6.26	74.6	20.8	
1511	1.10	3.914	"	3.53	5154	6.30	75.8	20.8	
1513	1.20	3.910	"	5.26	5160	6.40	75.2	20.9	
1515	1.30	3.906	"	6.10	5061	6.49	72.7	20.8	
1517	1.35	3.906	"	6.39	4911	6.52	73.2	20.8	
1519	1.40	3.906	"						
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected			QA/QC Information		Field Comments	
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)			Bore volume calculation, bore condition, fate of tubing, redox correction etc. 1 extra amber PID=0.0	
		2 x 40 mL Vial (H ₂ SO ₄)	2 x 100 mL Amber	1 x 250 mL Plastic				

Approval and Distribution			
Fieldwork Staff Signature: [Signature]		Date: 4-10-17	
Project Manager Signature: [Signature]		Date: 8-11-17	
Checker Name and Signature: _____		Date: _____	
Distribution: Project Central File			

FIELDWORK QUALITY MANUAL

Bore ID:

MW1708
(APEC 38)

FQM-5.05-F1 - GROUNDWATER SAMPLING AND PURGING RECORD

Project Name:	Perth Airport Limited DSI	Project Number:	60543717.1.3	PM Name:		Sample Date:	17-10-17
Client:	Air Services Australia Pty Ltd	Project Location:	APEC 38	Fieldwork Staff:		Well Development or Well Sampling Event? (circle)	
GENERAL BORE INFORMATION		PARAMETER INFO		DECONTAMINATION		SAMPLING METHOD:	
Date of GW Level:	17-10-17	Bore Radius (mm):	50	Chem Kit Serial No.:	15K100321	☒ Decontaminated	☒ Low Flow: Pump rate: 0.1 L/min
Depth to GW (m-pvc):	6.357	Screen Interval (m):	KNAS-5-85	Chem Kit Model:	48 PRO PLUS	☐ Dedicated	Intake depth: 6.7
Bore Depth (m-pvc):	9.00	Casing Radius (mm):		Corrected Redox:	Y / N	☐ Disposable	☐ Bailer ☐ Hydrasleeve
Depth to Product (m-pvc):	-	Cover Type (gatic/slick up):		(The correction to apply is probe dependent)		☐ Other (specify)	☒ Peristaltic Pump ☐ Waterra
Product Thickness (m):	-	Bore Locked (YES/NO):		Parameter method:	☐ Downhole	☐ Other (specify)	☐ Other (specify)
		Key Type (if applicable):			☒ Retrieved		
Calculated bore volume (L):	-	Includes/ excludes bore annulus (circle)	-	# purge volumes removed:	-	Total purged volume (L):	1.6

WATER QUALITY PARAMETERS

Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
1437	0.10	6.372	MIN	0.44	1843	6.10	75.7	20.2	
1439	0.30	6.372	MIN	0.31	1787	6.02	67.9	20.2	
1441	0.80	6.372	MIN	0.28	1774	6.02	65.5	20.2	
1443	1.00	"	"	0.25	1759	6.02	61.8	20.2	
1445	1.30	"	"	0.22	1743	6.02	53.5	20.2	
1447	1.60	"	"	0.18	1695	6.02	45.4	20.3	
1449	1.80	"	"	0.30	1732	5.99	49.8	20.5	
1451	2.00	"	"	0.34	1785	5.97	54.8	20.6	
1453	2.20	"	"	0.34	1790	5.97	53.3	20.6	WHITE, ODOURLESS, OPAQUE
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

ANALYTES SAMPLED FOR:		BOTTLES COLLECTED			QA/QC INFORMATION	FIELD COMMENTS
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)	1 X EXTRA AMBER	Bore volume calculation, bore condition, fate of tubing, redox correction etc. p10 = 0.0
		2 x 40 mL Vial (H ₂ SO ₄)	2 x 100 mL Amber	1 x 250 mL Plastic		
Approval and Distribution						
Fieldwork Staff Signature		Date		Checker Name and Signature		Date
Project Manager Signature		Date		Distribution: Project Central File		

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FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

Project Name:		PAPL Perth Airport	Project Number:		60543717	PM Name:			Sample Date:		ONWS CAPEC
Client:		ASA	Project Location:		APEC 4	Fieldwork Staff:			Well Development or Well Sampling Event? (circle)		
General Bore Information			Parameter Info.			Decontamination		Sampling Method		Hydrasleeve Info.	
Date of GW Level:	4-10-17	Bore Radius (mm):		Chem Kit Serial No.:		☒ Decontaminated ☒ Dedicated ☒ Disposable ☐ Other (specify)		Low Flow Pump rate: Intake depth: 2.9		Hydrasleeve Size:	Monitoring sequence followed (number in order): Gauging Hydrasleeve in Parameters
Depth to GW (m-pvc):	2.874	Screen Interval (m):		Chem Kit Model:	VSI PRO+					Hydrasleeve Type:	
Bore Depth (m-pvc):	-	Casing Radius (mm):		Corrected Redox:	Y / N			☐ Bailor ☐ Hydrasleeve ☒ Peristaltic Pump ☐ Waterra		Sampling Depth (m-pvc):	
Depth to Product (m-pvc):	-	Cover Type (gatic/stick up):		(The correction to apply is probe dependent)				☐ Other (specify)		Hydrasleeve Install time:	
Product Thickness (m):	-	Bore Locked (YES/NO):		Parameter method:	☐ Downhole ☒ Retrieved			☐ Other (specify)		Sampling Start Time:	
Calculated bore volume (L): -		Includes/ excludes bore annulus (circle) -		# purge volumes removed:	-	Total purged volume (L):		1 L			
Water Quality Parameters											
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity		
1027	0.10	2.384	25%	0.62	484.1	6.49	-190.9	18.3	LIGHT YELLOW, VERY SLIGHT SULFUR ODOUR		
1029	0.50	2.383	"	0.50	499.8	6.49	-216.8	18.3	SLIGHT TURBIDITY.		
1031	0.90	2.383	"	0.30	499.1	6.48	-217.6	18.5			
1033	1.20	2.383	"	0.42	501.3	6.48	-216.8	18.4			
1035	1.50	"	"	0.32	503.3	6.49	-218.0	18.5			
1037	1.90	"	"	0.32	516.7	6.48	-223.8	18.5			
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)		
Analytes Sampled for:		Bottles Collected				QA/QC Information		Field Comments			
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)	1 extra amber		Bore volume calculation, bore condition, fate of tubing, redox correction etc.				
		x 40 mL Vial (H ₂ SO ₄)	x 100 mL Amber	x 250 mL Plastic			PID=0.0 east of current ARFF fire station				
Approval and Distribution											
Fieldwork Staff Signature		Date	Checker Name and Signature				Date				
Project Manager Signature		Date	Distribution: Project Central File								

FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1
MW1706 (APEC4)
11-10-13

Q4AN(EV)-405-FM1
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Revision 1 May 2, 2016

Project Name:		PAPL Perth Airport	Project Number:		60543717	PM Name:			Sample Date:		6-10-17
Client:		ASA	Project Location:		APEC5	Fieldwork Staff:			Well Development or Well Sampling Event? (circle)		
General Bore Information				Parameter Info.		Decontamination		Sampling Method		Hydrasleeve info.	
Date of GW Level:	6-10-17	Bore Radius (mm):		Chem Kit Serial No.:		☒ Decontaminated	☒ Low Flow Pump rate: 0.1 L/min	Hydrasleeve Size:	Monitoring sequence followed (number in order):		
Depth to GW (m-pvc):	1.818	Screen Interval (m):		Chem Kit Model:		☒ Dedicated	Intake depth: 2-4	Hydrasleeve Type:			
Bore Depth (m-pvc):	4.50	Casing Radius (mm):		Corrected Redox: Y N		☒ Disposable	☐ Bailor ☐ Hydrasleeve	Sampling Depth (m-pvc):	Gauging		
Depth to Product (m-pvc):		Cover Type (gatic/stick up):		(The correction to apply is probe dependent) ☐	Other (specify)	☒ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	Hydrasleeve in			
Product Thickness (m):		Bore Locked (YES/NO):		Parameter method: ☐ Downhole ☒ Retrieved		☐ Other (specify)	Sampling Start Time:	Hydrasleeve out			
		Key Type (if applicable):						Parameters			
Calculated bore volume (L):		Includes/ excludes bore annulus (circle)		# purge volumes removed:	Total purged volume (L):						
Water Quality Parameters											
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity		
1024	1.820	0.10	RIN	2.05	846	5.63	6.0	19.7			
1026	1.824	0.50	"	1.60	848	5.62	1.1	20.2			
1028	1.827	0.90	"	1.75	869	5.60	8.5	20.1			
1030	1.824	1.20	"	1.57	869	5.60	-3.0	20.2			
1032	1.824	1.60	"	1.72	879	5.59	-6.7	20.2			
1034	1.825	2.00	"	1.63	878	5.59	-8.3	20.2	BROWN MELLOW, ODORLESS & TRANSPARENT		
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)		
Analytes Sampled for:		Bottles Collected				QA/QC Information		Field Comments			
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)	ix extra amber		Bore volume calculation, bore condition, fate of tubing, redox correction etc.				
X	✓	2 x 40 mL Vial (H ₂ SO ₄)	2 x 100 mL Amber	1 x 250 mL Plastic			PID = 0.0				
Approval and Distribution						WQA#3 - 061017 - F.B WQA#4 - 061017 - Rindoe					
Fieldwork Staff Signature		Date	Checker Name and Signature		Date						
Project Manager Signature		Date	Distribution: Project Central File								

FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

Project Name:		PAPL Perth Airport	Project Number:		60543717		PM Name:			Sample Date:		6-10-17	
Client:		ASA	Project Location:		APECS		Fieldwork Staff:			Well Development or Well Sampling Event? (circle)			
General Bore Information				Parameter Info.			Decontamination		Sampling Method			Hydrasleeve Info.	
Date of GW Level:		6-10-17		Bore Radius (mm):		50		Chem Kit Serial No.:				Monitoring sequence followed (number in order):	
Depth to GW (m-pvc):		1.332		Screen Interval (m):		2.5-5.5		Chem Kit Model:				Hydrasleeve Size:	
Bore Depth (m-pvc):		6.25		Casing Radius (mm):		100		Corrected Redox: Y / N		Y / N		Hydrasleeve Type:	
Depth to Product (m-pvc):				Cover Type (gatic/stick up):		(The correction to apply is probe dependent)		Other (specify)				Sampling Depth (m-pvc):	
Product Thickness (m):				Bore Locked (YES/NO):		Parameter method: Downhole / Retrieved						Gauging	
				Key Type (if applicable):								Hydrasleeve Install time:	
												Hydrasleeve out Parameters	
Calculated bore volume (L):				Includes/ excludes bore annulus (circle)				# purge volumes removed:				Total purged volume (L):	
Water Quality Parameters													
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity				
0955	0.10	1.580	MIN	2.01	529.5	6.43	44.3	19.6					
0957	0.20	1.586	"	1.79	521.4	6.37	88.5	20.2					
0959	0.40	1.586	"	1.70	516.6	6.37	41.8	19.9					
1001	0.80	1.609	"	1.70	511.8	6.36	21.3	20.0					
1003	1.10	1.639	"	1.70	510.6	6.36	27.5	19.8					
1005	1.50	1.647	(0.14/min)	1.88	508.3	6.35	36.4	19.9	ODOURLESS, COLOURLESS, TRANSPARENT				
Acceptable Parameter Range: ± 10% ± 3% ± 0.05 ± 10 mV ± 0.2 °C ± 10% turbidity (if using a turbidity meter)													
Analytes Sampled for:		Bottles Collected				QA/QC Information		Field Comments					
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)			Bore volume calculation, bore condition, fate of tubing, redox correction etc.						
X	✓	x 40 mL Vial (H ₂ SO ₄)	x 100 mL Amber	x 250 mL Plastic			WQA11-061017 - DUPLICATE WQA12-061017 - TRIPPLICATE PID=0.10						
Approval and Distribution													
Fieldwork Staff Signature		Date	Checker Name and Signature		Date								
Project Manager Signature		Date	Distribution: Project Central File										

MW0179
(Shallow)

Project Name:	Perth Airport Limited DSI	Project Number:	60543717.1.3	PM Name:		Sample Date:	18-10-18
Client:	Air Services Australia Pty Ltd	Project Location:	APEC 5	Fieldwork Staff:		Well Development or Well Sampling Event? (circle)	

GENERAL BORE INFORMATION		PARAMETER INFO.		DECONTAMINATION	SAMPLING METHOD:		HYDRASLEEVE INFO.	
Date of GW Level: 18-10-17	Bore Radius (mm): 50mm	Chem Kit Serial No.: 15K100321	☒ Decontaminated	☒ Low Flow: Pump rate: MIN		Hydrasleeve Size:	Monitoring sequence followed (number in order):	
Depth to GW (m-pvc): 0.80	Screen Interval (m): N/A	Chem Kit Model: 451 PRO PLUS	☒ Dedicated	Intake depth: 1.3		Hydrasleeve Type:		
Bore Depth (m-pvc): 2.81	Casing Radius (mm): 150mm	Corrected Redox: Y / (N)	☒ Disposable	☐ Bailer	☐ Hydrasleeve	Sampling Depth (m-pvc):		Gauging
Depth to Product (m-pvc): -	Cover Type (cable stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump	☐ Waterra	Hydrasleeve Install time:		Hydrasleeve in
Product Thickness (m): -	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☐ Other (specify)		Sampling Start Time:		Hydrasleeve out
	Key Type (if applicable):	☒ Retrieved					Parameters	
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:	Total purged volume (L):					

[illegible]

± 10% turbidity (if using a turbidity meter)

ANALYTES SAMPLED FOR:		BOTTLES COLLECTED			QA/QC INFORMATION	FIELD COMMENTS
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)		Bore volume calculation, bore condition, fate of tubing, redox correction etc.
		x 40 mL Vial (H ₂ SO ₄)	x 100 mL Amber	x 250 mL Plastic		

$$PID = 0.0$$

Approval and Distribution			
Fieldwork Staff Signature	18-10-17	Checker Name and Signature	Date
Project Manager Signature	8-11-17	Distribution: Project Central File	

MIN 0179D

18-10-17

Calculated bore volume (L):	includes/excludes bore annulus (circle)	1. P-3	WATER QUALITY PARAMETERS
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[illegible]

± 10% turbidity (if using a turbidity meter)

Approval and Distribution

Approval and Distribution		Approval and Distribution	
Fieldwork Staff Signature	18-10-17 Date	Checker Name and Signature	Date
Project Manager Signature	8-11-17 Date	Distribution: Project Central File	

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FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

Project Name: Perth Airport LSI		Project Number: 60543717		PM Name: [REDACTED]		Sample Date: 21/9/17			
Client: Airservices Australia		Project Location: Perth Airport		Fieldwork Staff: [REDACTED]		Well Development or Well Sampling Event? (circle)			
General Bore Information				Parameter Info		Decontamination			
Date of GW Level: 21-9-17	Bore Radius (mm): 50	Chem Kit Serial No.:	☒ Decontaminated		Sampling Method		Hydrasleeve info.		
Depth to GW (m-pvc): 2.46	Screen Interval (m): N/A	Chem Kit Model: YSL P1010US	☐ Dedicated		Low Flow Pump rate: 1.35		Hydrasleeve Size:		
Bore Depth (m-pvc): 6.70	Casing Radius (mm): 100	Corrected Redox: Y N	☐ Disposable		Intake depth: 3.0		Hydrasleeve Type:		
Depth to Product (m-pvc): —	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)		☒ Peristaltic Pump		Sampling Depth (m-pvc):		
Product Thickness (m): —	Bore Locked (YES/NO): NO	Parameter method: ☐ Downhole			☐ Waterra		Hydrasleeve Install time:		
	Key Type (if applicable): —	☐ Retrieved			☐ Other (specify)		Sampling Start Time:		
Calculated bore volume (L): —	Includes/ excludes bore annulus (circle) —	# purge volumes removed: —	Total purged volume (L): 1.35		Monitoring sequence followed (number in order):				
Water Quality Parameters									
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
9:45	SW1712	—	—	43.6	373	7.15	19	19.1	0402711/6463656, flow N → Salang Hume - Miller (right side of road if facing stn) clear, low turb, NO, flowing but slowly
11:25	MAX 4	2.46	0.15	16.3	780	6.71	-70	18.6	Stick up 0.60m
11:28			0.15	14.5	782	6.64	-90	18.6	
11:31			0.15	13.9	781	6.62	-87	18.6	
11:34			0.15	13.8	782	6.60	-85	18.6	Brown, low turb, NO
Acceptable Parameter Range: ± 10% ± 3% ± 0.05 ± 10 mV ± 0.2 °C ± 10% turbidity (if using a turbidity meter)									
Analytes Sampled for:		Bottles Collected				QA/QC Information		Field Comments	
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)	[REDACTED]		Bore volume calculation, bore condition, fate of tubing, redox correction etc. "overall" permeable well		
	BTEX	x 40 mL Vial (H ₂ SO ₄)	x 100 mL Amber	x 250 mL Plastic					
	TRH								
	PFAS			x PFAS					
Approval and Distribution									
Fieldwork Staff Signature		Date: 21-9-17		Checker Name and Signature		Date			
Project Manager Signature		Date: 8-11-17							
Distribution: Project Central File									

FIELDWORK QUALITY MANUAL

FQM-5.05-F1 – GROUNDWATER SAMPLING AND PURGING RECORD

Bore ID: MW0120N

Project Name: Perth Airport Limited DSI Project Number: 60543717.1.3 PM Name: [REDACTED]
 Client: Air Services Australia Pty Ltd Project Location: Overall Well Fieldwork Staff: [REDACTED] Sample Date: 17-10-17

GENERAL BORE INFORMATION

Date of GW Level: 17-10-17
 Depth to GW (m-pvc): 1.934
 Bore Depth (m-pvc): [REDACTED]
 Depth to Product (m-pvc): [REDACTED]
 Product Thickness (m): [REDACTED]
 Calculated bore volume (L): [REDACTED]
 Includes/ excludes bore annulus (circle) [REDACTED]

PARAMETER INFO.

Chem Kit Serial No.: [REDACTED]
 Chem Kit Model: 451 PRO PLUS
 Corrected Redox: Y / N
 (The correction to apply is probe dependent)
 Parameter method: ☐ Downhole ☐ Retrieved

DECONTAMINATION

☒ Decontaminated
☐ Dedicated
☐ Disposable
☐ Other (specify)

SAMPLING METHOD:

Low Flow: Pump rate: [REDACTED]
 Intake depth: 2.5
☐ Bailor ☐ Hydrasleeve
☒ Peristaltic Pump ☐ Waterra
☐ Other (specify)

HYDRASLEEVE INFO.

Monitoring sequence followed (number in order):
 Hydrasleeve Size: [REDACTED]
 Hydrasleeve Type: [REDACTED]
 Sampling Depth (m-pvc): [REDACTED]
 Hydrasleeve Install time: [REDACTED]
 Sampling Start Time: [REDACTED]
 Parameters

WATER QUALITY PARAMETERS

Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
1628	0.10	2.034	MIN	1.93	310.3	5.24	181.3	20.2	
1628	0.30	2.090	MIN	1.80	299.1	5.14	212.3	20.3	
1630	0.70	2.126	MIN	2.27	252.4	5.13	225.6	20.4	
1632	1.00	2.161	MIN	2.89	232.3	5.20	227.8	20.5	
1634	1.40	2.210	MIN	3.09	204.7	5.30	228.1	20.2	
1636	1.80	2.245	MIN	3.44	183.7	5.33	227.6	20.2	
1638	2.00	2.296	MIN	4.19	137.0	5.37	226.5	20.1	
1640	2.20	2.327	MIN	4.71	120.9	5.39	225.5	19.9	
* SWL DROPPING FAST. SAMPLE TAKEN HERE BEFORE STABILIZATION TO ENSURE ENOUGH WATER FOR SAMPLING. LIGHT YELLOW, MOD TURBIDITY, ODOORLESS									

Acceptable Parameter Range:

± 10% ± 3% ± 0.05 ± 10 mV ± 0.2 °C

± 10% turbidity (if using a turbidity meter)

ANALYTES SAMPLED FOR:

Field Filtered: [REDACTED] Unfiltered: [REDACTED]

BOTTLES COLLECTED

x 40 mL Vial (HCl) x 60 mL Ferrous x 60 mL metals (HNO₃)
 2 x 40 mL Vial (H₂SO₄) 1 x 100 mL Amber 1 x 250 mL Plastic

QA/QC INFORMATION

FIELD COMMENTS

Bore volume calculation, bore condition, fate of tubing, redox correction etc.

PID=0.0

Approval and Distribution

Fieldwork Staff Signature

Date

Checker Name and Signature

Date

Project Manager Signature

Date

Distribution: Project Central File

MNO120

[illegible]

FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

[illegible]

Q4AN(EV)-405-FM1

MWO 154

"Overall" Representative
Well
Nth of Perth Airport
Gate Access Required.

and Purging Record

Q4AN(EV)-405-FM1

MW0123 / MB128

Project Number: 60543717		PM Name:		Sample Date: 18-10-1977														
Project Location: Perth Airport		Fieldwork Staff:		Well Development or Well Sampling Event? (circle)														
General Bore Information		Parameter Info.		Decontamination														
Bore Radius (mm):	Chem Kit Serial No.:	☐ Decontaminated		☐ Low Flow Pump rate:														
Screen Interval (m):	Chem Kit Model:	☐ Dedicated		Intake depth:														
Casing Radius (mm):	Corrected Redox: Y / N	☐ Disposable		☐ Bailer ☐ Hydrasleeve														
Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)		☐ Peristaltic Pump ☐ Waterra														
Bore Locked (YES/NO):	Parameter method: ☐ Downhole	☐ Other (specify)		☐ Hydrasleeve Install time:														
Key Type (if applicable):	☐ Retrieved			Sampling Start Time:														
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:	Total purged volume (L):															
Water Quality Parameters																		
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or μ S/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity									
Cannot Sample Road is flooded																		
Acceptable Parameter Range:		± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)											
Analytes Sampled for:		Bottles Collected				QA/QC Information		Field Comments										
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)			Bore volume calculation, bore condition, fate of tubing, redox correction etc.											
		x 40 mL Vial (H ₂ SO ₄)	x 100 mL Amber	x 250 mL Plastic														
Approval and Distribution																		
Fieldwork Staff Signature		Date	Checker Name and Signature		Date													
Project Manager Signature		Date	Distribution: Project Central File															

FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

Project Name: Perth Airport LSI		Project Number: 60543717		PM Name:		Sample Date: 20-21/09/17			
Client: Airservices Australia		Project Location: Perth Airport		Fieldwork Staff:		Well Development or Well Sampling Event? (circle)			
General Bore Information				Parameter Info.		Decontamination			
Date of GW Level:		Bore Radius (mm):		Chem Kit Serial No.: 15K100325		☒ Decontaminated			
Depth to GW (m-pvc):		Screen Interval (m):		Chem Kit Model: YSI10 PLUS		☐ Dedicated			
Bore Depth (m-pvc):		Casing Radius (mm):		Corrected Redox: Y / N		☐ Disposable			
Depth to Product (m-pvc):		Cover Type (gatic/stick up):		(The correction to apply is probe dependent)		☐ Other (specify)			
Product Thickness (m):		Bore Locked (YES/NO):		Parameter method: ☐ Downhole		☐ Peristaltic Pump ☐ Waterra			
		Key Type (if applicable):		☒ Retrieved		☐ Other (specify)			
Calculated bore volume (L):		Includes/ excludes bore annulus (circle)		# purge volumes removed:		Total purged volume (L):			
Water Quality Parameters									
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	SEC (mS/cm or μ S/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
9:00	DATE	LOCATION							
9:30	"	SW1705		3.94	395.4	6.76	96.5	18.3	Green, Low turb, No odour
10:00	"	SW1708		3.20	175	7.01	108	19.0	Green med turb, No odour
10:30	"	SW1714		6.94	508	6.94	120	19.0	Brown, Med Turb, No odour
11:00	"	SW1702		10.67	345	7.07	93.6	26.7	Brown, low turb, NO
11:30	"	SW1709		5.19	483	6.95	106	25.6	Brown, medium turb, NO
12:00	"	SW1710		1.13	571	6.99	99	22.3	Brown, low turb, NO $\rightarrow$ E $\rightarrow$ W, high flowing
1:00	"	SW1711		1.14	655	7.10	91	23.2	0403599/6461079, 1S $\rightarrow$ N flow
2:00	"	SW1711		4.35	722	6.85	79	18.1	Clear, low turb, NO
2:15	"	SW1713		9.37	725	6.99	76	24.2	Clear, low turb, NO
8:00	21/9	SW1715		3.97	526	6.98	32	18.2	Clear, low turb, NO 0404254/6464733
8:40	21/9	SW1701		2.23	428	7.05	51	19.1	flowing E $\rightarrow$ W flowing N $\rightarrow$ S? 0403902/6462632, clear
Acceptable Parameter Range:				$\pm 10\%$	$\pm 3\%$	± 0.05	± 10 mV	± 0.2 °C	$\pm 10\%$ turbidity (if using a turbidity meter)
Analytes Sampled for:		Bottles Collected				QA/QC Information		Field Comments	
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl) 22 x 40 mL Vial (H ₂ SO ₄) 11 x 60 mL Ferrous 11 x 100 mL Amber 11 x 60 mL PFAS				SW1705-200917 (Dup) WQA03-200917 (Dup) WQA04-200917 (Dup)		Bore volume calculation, bore condition, fate of tubing, redox correction etc. SW1708 "Limestone Creek"	
Approval and Distribution									
Fieldwork Staff Signature		Date		Checker Name and Signature		Date			
Project Manager Signature		8-11-17							
Distribution: Project Central File									

FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

Project Name:		Perth Airport LSI	Project Number:		60543717	PM Name:			Sample Date:		21-09-17
Client:		Airservices Australia	Project Location:		Perth Airport	Fieldwork Staff:			Well Development or Well Sampling Event? (circle)		
General Bore Information				Parameter Info.		Decontamination		Sampling Method		Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.: YSL100385	☒ Decontaminated		☐ Low Flow Pump rate:		Intake depth:		Hydrasleeve Size:	Monitoring sequence followed (number in order):	
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model: YSL Pro Plus	☐ Dedicated						Hydrasleeve Type:	Gauging	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y N	☐ Disposable		☐ Bailer		☐ Hydrasleeve		Sampling Depth (m-pvc):	Hydrasleeve in	
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)		☐ Peristaltic Pump		Waterra		Hydrasleeve Install time:	Hydrasleeve out	
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole			☒ Other (specify)		Grab		Sampling Start Time:	Parameters	
	Key Type (if applicable):	☒ Retrieved									
Calculated bore volume (L):		Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):						
Water Quality Parameters											
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity		
SW1703	—	—	—	5.82	463	7.51	42	19.7	Clear, low turb, NO		
SW1704	—	—	—	3.90	489	7.20	55	19.7	0401211, 0464871 clear, low turb, No		
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)		
Analytes Sampled for:		Bottles Collected				QA/QC Information		Field Comments			
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)				Bore volume calculation, bore condition, fate of tubing, redox correction etc.			
		x 40 mL Vial (H ₂ SO ₄)	x 100 mL Amber	x 250 mL Plastic							
		x 60 mL PEAS									
Approval and Distribution											
Fieldwork Staff Signature		Date		Checker Name and Signature		Date					
Project Manager Signature		Date		Distribution: Project Central File							

Project Name:		Perth Airport LSI	Project Number:		60543717	PM Name:			Sample Date:		21-09-17
Client:		Airservices Australia	Project Location:		Perth Airport	Fieldwork Staff:			Well Development or Well Sampling Event? (circle)		
General Bore Information				Parameter Info.		Decontamination		Sampling Method		Hydrasleeve info.	
Date of GW Level:		Bore Radius (mm):	Chem Kit Serial No.: 15K100525		☒ Decontaminated		☒ Low Flow Pump rate:		Hydrasleeve Size:		Monitoring sequence followed (number in order):
Depth to GW (m-pvc):		Screen Interval (m):	Chem Kit Model: VSI Pro Plus		☐ Dedicated		Intake depth:		Hydrasleeve Type:		
Bore Depth (m-pvc):		Casing Radius (mm):	Corrected Redox: Y N		☐ Disposable		☐ Bailor ☐ Hydrasleeve		Sampling Depth (m-pvc):		Gauging
Depth to Product (m-pvc):		Cover Type (gatic/stick up):	(The correction to apply is probe dependent)		☐ Other (specify)		☐ Peristaltic Pump ☐ Waterra		Hydrasleeve Install time:		Hydrasleeve in
Product Thickness (m):		Bore Locked (YES/NO):	Parameter method: ☐ Downhole ☒ Retrieved				☒ Other (specify) Grab		Sampling Start Time:		Hydrasleeve out
Key Type (if applicable):										Parameters	
Calculated bore volume (L):		Includes/ excludes bore annulus (circle)		# purge volumes removed:		Total purged volume (L):					
Water Quality Parameters											
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (mg/L)	E.C. (µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity		
SW1707				6.22	90	7.83	61	20.3	Clean, E → W?, low turbidity No odour		
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)		
Analytes Sampled for:		Bottles Collected				QA/QC Information		Field Comments			
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)				Bore volume calculation, bore condition, fate of tubing, redox correction etc.			
		2 x 40 mL Vial (H ₂ SO ₄)	1 x 100 mL Amber	x 250 mL Plastic							
			1 x 60 mL PFAS								
Approval and Distribution											
Fieldwork Staff Signature		Date	Checker Name and Signature				Date				
Project Manager Signature		Date	Distribution: Project Central File								

SW1706

Q4AN(EV)-405-FM1

SW1717

FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1
FQM - Groundwater Sampling and Purging Record (Q4AN(EV)-405-FM1)
Revision 1 May 2, 2016

FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

Project Name:		PAPL Perth Airport	Project Number:		60543717		PM Name:			Sample Date:		4-10-17			
Client:		ASA	Project Location:		AEC 3A		Fieldwork Staff:			Well Development or Well Sampling Event? (circle)					
General Bore Information				Parameter Info.		Decontamination		Sampling Method			Hydrasleeve info.				
Date of GW Level:		4-10-17		Bore Radius (mm):		Chem Kit Serial No.:		☐ Decontaminated		☒ Low Flow Pump rate:		Hydrasleeve Size:		Monitoring sequence followed (number in order):	
Depth to GW (m-pvc):				Screen Interval (m):		Chem Kit Model:		☒ Dedicated		Intake depth:		Hydrasleeve Type:		Gauging	
Bore Depth (m-pvc):				Casing Radius (mm):		Corrected Redox: Y / N		☒ Disposable		☒ Bailer		☒ Hydrasleeve		Sampling Depth (m-pvc):	
Depth to Product (m-pvc):				Cover Type (gatic/stick up):		(The correction to apply is probe dependent)		☒ Other (specify)		☒ Peristaltic Pump		☒ Waterra		Hydrasleeve Install time:	
Product Thickness (m):				Bore Locked (YES/NO):		Parameter method: ☐ Downhole				☒ Other (specify)				Sampling Start Time:	
				Key Type (if applicable):		☐ Retrieved								Parameters	
Calculated bore volume (L):			Includes/ excludes bore annulus (circle)			# purge volumes removed:			Total purged volume (L):						
Water Quality Parameters															
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity						
									No surface water - Dry						
Acceptable Parameter Range:									± 10% ± 3% ± 0.05 ± 10 mV ± 0.2 °C ± 10% turbidity (if using a turbidity meter)						
Analytes Sampled for:			Bottles Collected				QA/QC Information			Field Comments					
Field Filtered:		Unfiltered:		x 40 mL Vial (HCl)		x 60 mL Ferrous		x 60 mL metals (HNO ₃)		Bore volume calculation, bore condition, fate of tubing, redox correction etc.					
				x 40 mL Vial (H ₂ SO ₄)		x 100 mL Amber		x 250 mL Plastic							
Approval and Distribution															
Fieldwork Staff Signature			4-10-17		Checker Name and Signature			Date							
Project Manager Signature			8-11-17												
Distribution: Project Central File															

Q4AN(EV)-405-FM1

Q4AN(EV)-405-FM1
FQM - Groundwater Sampling and Purging Record (Q4AN(EV)-405-FM1)
Revision 1 May 2, 2016

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Q4AN(EV)-405-FM1

SW1723

Q4AN(EV)-405-FM1
FQM - Groundwater Sampling and Purging Record (Q4AN(EV)-405-FM1)
Revision 1 May 2, 2016

Q4AN(EV)-405-FM1

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O.P = Outer Perimeter
 LS = Landside
 AS = Airside

50 OTM
 finishing type

Perth Airport Details Site Investigation with Limited Site Investigations

Time	Date	APEC	Well ID	Photo	Nothing Easting	Nothing North	TOC Elevation (mAH)	Well Material	Well Finishing	Well Condition	Cap? (Y/N)	Well Inner Diameter (mm)	Height of PVC Riser (m)	DTW (mbtoc)	Total Depth (mbtoc)	Depth to LNAPL	LNAPL Thickness (m)	Bailed? (Y/N)	Comments	PID (ppm)
7:50	18/10/17	O.P. MW L.S.	0120N	✓	6466882	0404201	riser	PVC	Protected	Good	Y	50	0.63	1.949	4.65	-	-	N	survey mark height from ground for riser	0
8:42	18/10/17	2	MW0221	✓	N/A	N/A	flush	PVC	Protected	Good	Y	50	0.05	1.545	4.41	-	-	N	filled w water inside casing flush mount. no survey mark → added. cleared water	1
8:52	18/10/17	2	MW0220	✓	N/A	N/A	flush	PVC	Protected	Good	Y	50	0.12	0.950	4.42	-	-	N	flush mount filled w water → cleared no survey mark → added. water (synthetic)	1
9:32	18/10/17	3a	MW-FTG2 MW-FTG2	✓	N/A	N/A	riser	PVC	Protected	Good	Y	50	1.08	3.023	4.80	-	-	N	no survey mark → added	0
9:36	18/10/17	3a	MW-FTG1	✓	N/A	N/A	riser	PVC	Protected	Good	Y	50	0.82	2.678	4.70	-	-	N	survey mark	0
9:47	18/10/17	3a	MW-FTG3	✓	N/A	N/A	riser	PVC	Unpro	Good (NY)	Y	50	3.331	8.721	4.130-8.721	-	-	N	no odours → sludge on well → unlikely no survey mark → added to be Hydrocarbon	0
10:00	18/10/17	4	MW1706	✓	N/A	N/A	riser	PVC	Protected	Good	Y	50	0.63	1.972	4.52	-	-	N	survey mark added	0
10:05	18/10/17	4	ONW5	✓	N/A	N/A	riser	PVC	Protected	Good	Y	50	0.86	2.458	5.20	-	-	N	survey mark	0
10:24	18/10/17	5	MW0179	✓	6466322	0403216	flush	PVC	Protected	Good	Y	100	0.80	1.751	15.65	-	-	N	in vegetation behind old crates. survey mark	0
10:45	18/10/17	5	MW0179	✓	6466322	0403228	flush	PVC	Protected	Good - dirt build up in flush	Y	50	0.07	0.875	2.81	-	-	N	survey marked	0
11:42	18/10/17	5	MW1704	Previously taken	N/A	N/A	riser	PVC	Protected	Good	Y	50	0.68	1.802	4.50	-	-	N	survey marked	0
11:52	18/10/17	5	MW1705	Previously taken	N/A	N/A	riser	PVC	Protected	Good	Y	50	0.37	1.449	6.03	-	-	N	survey marked	0
12:09	18/10/17	O.P. L.S.	MW0154	✓	N/A	N/A	riser	PVC	Protected	Good	Y	50	0.64	1.949	2.93	-	-	N	survey mark	0 PID malfunction
12:45	18/10/17	O.P. L.S.	MW0146	✓	N/A	N/A	riser	PVC	Protected	Good	Y	50	0.60	5.858	8.95	-	-	N	survey mark	-
13:00	18/10/17	O.P. L.S.	MW0216	✓	N/A	N/A	riser	PVC	Protected	Good	Y	50	0.64	5.243	10.22	-	-	N	survey mark	-
13:30	18/10/17	O.P. L.S.	MW1708	✓	N/A	N/A	riser	PVC	Protected	Good	Y	50	0.80	6.441	8.85	-	-	N	survey marked	-
13:50	18/10/17	O.P. L.S. (BIT LINK)	MW01345	✓	6467068	0401128	riser	PVC	Protected	Good	Y	50	0.42	1.567	4.80	-	-	N	survey marked * not actually MW1035 -> Unknown	Unknown
13:59	18/10/17	1	MW34	✓	N/A	N/A	flush	PVC	Protected	Good	Y	50	0.08	1.652	10.30	-	-	N	survey marked	-
14:03	18/10/17	1	MW35	✓	N/A	N/A	flush	PVC	Protected	Good	Y	50	0.10	1.624	3.00	-	-	N	survey marked	-
14:15	18/10/17	1	MW37	✓	6466535	0401336	flush	PVC	Protected	Good	Y	50	0.09	1.462	5.45	-	-	N	survey mark	-
14:20	18/10/17	1	MW29	✓			flush	PVC	Protected	Good	Y	50	0.12	1.840	4.90	-	-	N	survey mark	-
14:28	18/10/17	1	MW28	✓			flush	PVC	Protected	Good	Y	50	0.09	1.822	5.50	-	-	N	survey mark	-
14:45	18/10/17	1	MW26	✓	6466604	0401381	flush	PVC	Protected	Good	Y	50	0.09	2.020	5.53	-	-	N	survey mark	-
15:00	18/10/17	L.S.	MW0180	✓			riser	PVC	Protected	Good	Y	50	0.70	2.402	7.16	-	-	N	on well: 212" marked survey marked	-
15:10	18/10/17	L.S. O.P.	MW0172	✓	6465695	0400925	riser	PVC	Protected	Good	Y	50	0.65	2.564	6.65	-	-	N	survey marked	-
15:35	18/10/17	6	MW1703	✓	N/A	N/A	riser	PVC	Protected	Good	Y	50	0.595	2.077	4.50	-	-	N	survey mark	-
16:10	18/10/17	6	MW1703	✓			flush	PVC	Protected	Good	Y	50	0.09	1.974	3.786	-	-	N	survey mark	-

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