Northern Access Route and Taxiway Zulu Per – and Polyfluorinated Alkyl Substances Investigation

Australia Pacific Airports Melbourne (APAM)

Environmental Site Assessment

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Glossary and abbreviations

The meanings of the terms used in this report are set out below.

Acronym	Definition
AFFF	Aqueous film forming foam
AOI	Analytes of interest
APAM	Australia Pacific Airports Melbourne
ASLP	Australian Standard Leaching Procedure (as per Table 2 of EPA Publication IWRG 621)
COPC	Contaminants of potential concern
EPC	Exposure point concentration
Fill or imported fill	Lithological description of disturbed ground; material known to have been placed or modified in some way by humans on the pre-existing natural land surface (including engineered fill). Not to be confused with Fill Material which is an IWRG classification for the purpose of disposal and reflects a specific chemical makeup of the material.
Fill Material	Uncontaminated material classified in accordance with the IWRG Regulations, specifically IWRG621 Soil Hazard Categorisation and Management 2010
IWRG	Industrial Waste Resource Guidelines
Jacobs	Jacobs Group (Australia) Pty Ltd
LOR	Limit of reporting
mbgl	meters below ground level
NAR	Northern Access Route
PFAS	Per – and polyfluorinated alkyl substances
PID	Photo-ionisation detector
QAQC	Quality assurance and quality control
UCL	Upper confidence limit
VOCs	Volatile Organic Compounds
SAQP	Sampling analysis and quality plan
SQO	Soil quality objectives

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1. Introduction

This report has been prepared by Jacobs Group (Australia) Pty Ltd (Jacobs) for Australia Pacific Airports Melbourne (APAM) and relates to soil investigations completed by Jacobs along the Northern Access Route (NAR) and Taxiway Zulu (Zulu) project areas (the "project area") within Melbourne Airport (the "site"). The ultimate project involves construction of new pavement for expansion of the Taxiway Zulu area and upgrading and extension of the Northern Access Route roadways. This investigation is required for the purpose of assessing soil contamination conditions to inform the management of spoil created as a result of construction activities on the project.

1.1 Background

Jacobs has previously completed preliminary soil investigations at site (Jacobs, 2017). The main findings of this investigation identified contaminants of concern including per – and polyfluorinated alkyl substances (PFAS) at concentrations which may materially impact on the Project. The focus of the current investigation is to complete further soil sampling and analysis to gain a better understanding of the nature and extent of contamination at the site. In particular, this assessment focuses on the primary contaminant of concern PFAS.

PFAS are a group of chemicals routinely found in the environment. The ubiquitous nature of PFAS relates to a combination of very unusual chemical properties leadings to environmental persistence and the widespread use in many industrial and commercial applications commonly associated with stain resistance and as surfactants in firefighting foam. At airports, storage, use and (in particular) emergency response fire training using aqueous film forming foams (AFFF) are the key potential sources of PFAS.

The scientific and regulatory community are in the early stages of understanding risks associated with PFAS. As a consequence, regulatory guidance is changeable and of a conservative nature. At the time of writing this report, the current guidance adopted for use in assessing onsite PFAS impact is outlined in HEPA (2018).

1.2 Objective

The objective of this report is to bring together previous results with the current investigation and to assess them as a whole against the updated criteria. This report will feed into both the PFAS Environmental Management Plan and subsequent Construction Environmental Management Plan. Results will be assessed against selected criteria to determine the risk of exposure to identified contamination to both humans and ecological receptors. In addition, results will be assessed against adopted criteria for onsite (within Melbourne airport) reuse / management. Jacobs understands that spoil generated from construction works will be temporarily stored at a purpose built stockpile location on site for a period of approximately two to three years prior to reuse in other projects at the Airport.

1.3 Site description

The Zulu works area is situated on the south east side of the intersection of the two main airport runways 09/27 and 16/34. The project area is further bound by Taxiways Alpha, Echo, Tango, Foxtrot, Victor, Sierra, Papa and Quebec. Due to the proximity of Zulu to the terminals, intersection of runways and interconnected taxiways, there is a high degree of airport traffic through this area. Works planned for Zulu include updating and expanding on existing pavement.

The NAR stretches from Sunbury Road in the north, along the eastern perimeter of the airport and connects with airport taxiways in the north eastern corner of the QANTAS domestic terminal. Planned works on the NAR involves new and / or upgraded access from Sunbury Road in the north and the construction of access and haul roads to and from the Zulu project. In addition, new building facilities including a security access point, Works Safety Officer hut and contractor facilities will be constructed to support construction activities within the northern precinct of the airport.

The Geological Survey of Victoria (1973) 1:63,360 scale Sunbury geological map sheet indicates the site is underlain by the Quaternary aged Newer Volcanics Formation. Newer Volcanics is identified as olivine basalt.

The upper portion of the basalt profile in this formation is typically weathered residual clay. However, shallow rock can be encountered, and large near surface basalt boulders (known as “floaters”) are often encountered in the clay matrix.

1.4 Contaminants of potential concern

While PFAS are the primary contaminants of concern for this investigation, other onsite activities may potentially result in contamination of soils. Potential sources of contamination related to the airport activities include:

- Fire control and emergency response fire training;
- Maintenance operations including weed control;
- Aircraft re-fuelling; and
- Aircraft de-icing

Table 1.1 below summarised the contaminants of concern that would arise from the above general activities

Table 1.1: Summary contaminants of concern.

Activity	General class description	Specific analytes of interest
Fire control	Aqueous fill forming foams which include PFAS compounds	Perfluorooctanoic acid (PFOA) / perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)
Weed control	Herbicides	Organochlorine pesticides (OCPs)
Re-fuelling	Hydrocarbons (predominantly jet-fuel)	Total recoverable hydrocarbons (TRHs), /benzene, toluene, ethyl benzene, xylenes (BTEX) /polycyclic aromatic hydrocarbons (PAHs)
De-icing	Glycols	Di-ethylene glycol / ethylene glycol / propylene glycol / triethylene glycol

1.5 Review of previous environmental reports

Jacobs has previously completed intrusive soil investigations across the project area in 2014 and 2015 (Jacobs, 2017). Environmental samples were collected from 24 test pits in 2014 and 20 bore holes in 2015 across the NAR and Zulu project areas. These samples were sent for analysis of identified contaminants of concern to Eurofins MGT (Eurofins) and Australian Laboratory Services (ALS). During sampling, no obviously contaminated or unusual materials were observed and there were no indications of the presence of volatile organic compounds (VOCs) using a photo-ionising detector (PID).

2014 and 2015 chemical results were compared to human health, ecological health and waste classification guidelines appropriate at the time of reporting. Table 1.2 below summarises key findings of these results.

Table 1.2: Summary of key results from 2014 and 2015 soil investigations across Zulu and NAR

Contaminant of concern	Assessment criteria	Findings	Outcome
Heavy metals	Waste Classification	Individual concentrations of nickel in soil were found to exceed the upper limit for Fill Material waste classification guidelines. However, the 95% upper confidence limit (UCL) for all heavy metal contaminants did not exceed the Fill Material classification guidelines.	*Likely* waste classification of soils is Fill Material
PFAS	Ecological, Human Health and Waste Classification	All PFAS total and leachable concentrations were below the adopted criteria available. However, at the time of reporting, there were no published PFAS waste classification guidelines	PFAS impacted soils preferred spoil management is onsite re-use.

Total concentrations of PFAS, specifically PFOS (mg/kg), above laboratory limits of reporting were detected in three of 53 samples analysed and leachable PFAS (µg/L) concentrations above laboratory limits of report (conducted at pH 5) were detected in six out of 17 samples analysed.

No obvious pattern to the PFOS detections was noted and given the size of the excavation area (~73 Ha), only a limited number of samples of soil were analysed in the 2014 and 2015 programs. As a result, it was recommended further works be completed which is the main subject of this report.

2. Methodology

2.1 Sampling locations

In order to better understand the nature and extent of contamination at site, an intrusive soil sampling program was completed. 53 primary samples were collected from 45 locations across Zulu and NAR. Previous work completed by Jacobs did not identify any particular pattern to the location of PFAS impacted soils. As such, a randomised sampling plan was implemented for these works. Randomised sampling locations were generated based on a pre-determined number of samples[1]. In some areas these locations were then moved due to accessibility issues and presence of underground services. Refer to Appendix A for sampling location figures.

2.2 Underground service clearance

51 locations were cleared of underground services by Construction Sciences (Cardno) using ground penetrating radar and radio detection methods in conjunction with existing service plans as provided by APAM (drawing CR18277). Additional locations above the 45 location scope were cleared to allow for flexibility when conducting soil sampling. Each location was marked out on the ground using spray paint and location details collected using a hand held global positioning system (GPS). In each location a one-meter square box was cleared. All locations were placed a minimum of 5 meters away from the nearest underground service. Following service clearance, all locations were physically sited with an APAM airfield lighting representative who then signed off on the Melbourne Airport Excavation Permit E5926 prior to commencement of intrusive soil sampling works.

2.3 Soil sampling

45 locations were sampled using a push tube drilling rig. Locations were advanced to an average of one meter below ground level (mbgl) or to refusal and one soil sample was collected from the shallow portion of each hole. In eight of these locations within the Zulu project area, one additional sample was collected at depth (between 0.8 to 1.15 mbgl) and initially placed on hold at the primary laboratory. In total 53 primary samples were collected.

Due to the soil volume generated by the push tube (diameter is 40mm), a composite sample was collected at each location to allow for enough sample to cover the selected analysis. For example, sample ZULU_SS051_0.4 is a composite sample of 0.0 to 0.4 mbgl. Each sample was emptied from the push tube into a container (hard plastic ice-cream container) and mixed around to “composite” the sample. The sample was then placed into laboratory supplied sample containers. Between each sampling interval, containers were decontaminated using a triple wash of two buckets deionised water or tap water and a third of PFAS free deionised water. A fresh inner plastic push tube was used for each location and the metal push tube bit footing was also decontaminated using the triple wash system.

PFAS sampling guidelines in Table A1 of WA DER (2017) were applied to prevent introduction of PFAS from external sources and fresh nitrile gloves were used for each sampling interval and between sampling locations to help prevent cross contamination between samples.

2.4 Laboratory analysis

Soil samples were preserved for transportation in laboratory supplied screw top jars labelled with the sample number, date, sampler initials and project code. Soil samples collected for the NEPM soil classification suite were placed into laboratory supplied plastic zip lock bags with the same labelling as sample jars. After collection, samples were placed into chilled portable coolers and submitted to the primary laboratory Eurofins under chain of custody procedures. Quality assurance and quality control (QAQC) inter-laboratory duplicate samples were forwarded by Eurofins to the secondary laboratory ALS. Both Eurofins and ALS are accredited by the National Association of Testing Authorities for the analysis performed.

[1] Sample locations were determined using Visual Sample Plan (available from https://vsp.pnnl.gov/)

The samples collected and analysis completed was in accordance with the Sampling Analysis and Quality Plan (SAQP) prepared prior to field works. Initially, 45 primary samples and nine QAQC samples (six duplicates and three rinsate field blanks) were scheduled for analysis at the lab. A further eight primary samples collected at depth were placed on hold.

After discussion with APAM and the Jacobs detailed design team, it was understood that several areas of the works would involve excavations to depths of up to 3.0 mbgl. Samples collected and analysed as part of the 2018 program ranged in depth from 0.0 to 0.6 mbgl. Hence, Jacobs sent the additional eight deeper samples for analysis of total concentration and leachable concentration of PFAS. The specific analytical suites for all 62 samples are outlined in Table 2.1.

Table 2.1 Summary of laboratory analysis program

Analysis	Number of primary samples	Number of QAQC samples	Total sample
EPA IWRG621 screen, total and leachable PFAS and sulfate	15	-	15
TPH, BTEX, PAH, and metals (8) and total and leachable PFAS	24	-	24
TPH, BTEX, PAH, and metals (8) and total PFAS	-	9	9
TPH, BTEX, PAH, and metals (8) and total and leachable PFAS and NEPM soil classification suite	6	-	6
Total and leachable PFAS (samples from depth initially on hold)	8	-	8
Total	**53**	**9**	**62**

Notes:

EPA IWRG Screen:

- Metals (As, Cd, Cr, Cu, Pb, Hg, Mo, Ni, Se, Ag, Sn and Zn)
- Total Petroleum Hydrocarbons (TPH) C_6-C_{36}
- Polycyclic aromatic hydrocarbons (PAHs)
- Volatile Organic Compounds (VOCs) including Monocyclic Aromatic Hydrocarbons (MAHs or BTEX)
- Semi Volatile Organic Compounds (sVOCs)
- Polychlorinated Biphenyls (PCBs)
- Organochlorine Pesticides (OCPs)
- Phenols
- Total Cyanide, Fluoride, pH and moisture content

PFAS suite:

Perfluorooctanesulfonic acid (PFOS), Perfluorooctanoic acid (PFOA), Perfluoropentane sulfonic acid (PFPeS), Perfluorooctanesulfonamide (PFOSA), Perfluoro-n-pentanoic acid (PFPeA), Perfluorononanoic acid (PFNA), Perfluorohexanoic acid (PFHxA), Perfluorohexanesulfonic acid (PFHxS), Perfluoroheptanoic acid (PFHpA), Perfluorododecanoic acid (PFDoA), Perfluorodecanoic acid (PFDA), Perfluoroheptane sulfonic acid (PFHpS), Perfluoroundecanoic acid (PFUnA), Perfluorobutanesulfonic acid (PFBS), Perfluorodecanesulfonic acid (PFDS), Perfluorotetradecanoic aicd (PFTeDA), Perfluorotridecanoic acid (PFTrDA), Perfluorobutanoic acid, 1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTS), 1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS), 1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS), 1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2), N-ethyl perfluorooctane sulfonamido acetic acid, N-ethyl perfluorooctane sulphonamide, N-methyl perfluorooctanesulfonamido ethanol, N-ethyl perfluorooctanesulfonamido ethanol, N-Methyl perfluorooctane sulphonamide and N-methyl perfluorooctane sulfonamido acetic acid

NEPM Soil Classification Suite:

- % iron, cation exchange capacity, pH ($CaCl_2$), Total Organic Carbon, % clay content

Some minor variations from the SAQP in the analysis program occurred during the implementation of the works. These did not have an adverse impact on the outcome of this report, however are listed below for clarity:

- Duplicate QAQC samples were only analysed for either PFAS or TPH, BTEX, PAH, and metals (8). This was due to the sample volume not being large enough to enable analysis of all elements for each duplicate set.
- Sample ZULU_SS005_0.11 was only analysed for PFAS due to low sample volume (refusal at 0.11 mbgl on rock).
- Additional analysis of eight deeper samples for PFAS only as outlined above.

2.5 Data interpretation methodology

2.5.1 Approach

This report will bring together data from the 2014 and 2015 investigations with the current 2018 investigation to look at the "dataset" as a whole. Unless otherwise indicated, all sections of the report herein will use this combined dataset.

The nature and extent of contamination is determined in a staged process as follows:

- **Stage 1:** Identifies the analytes of interest (AOIs); being those analytes for which a concentration was detected in any sample above the laboratory limit of reporting (LOR).
- **Stage 2**: Comprises an initial data characterisation step involving the definition of the EPC. The EPC is the concentration of contaminant in the soil that is used in the characterisation of risks from the soil.

  The selected EPCs used are either the 95% upper confidence limit (UCL) on the arithmetic mean concentration, or the maximum concentration where the 95% UCL cannot be calculated (i.e. due to data limitations such as an insufficient number of samples or detected results) or is not appropriate (i.e. for the assessment of risk to ecological receptors).

  The 95% UCL was calculated only for analytes where total concentrations exceeded Soil Quality Objectives (SQOs), using the US EPA's ProUCL Version 5.1 software (US EPA et al., 2015). The ProUCL recommended UCL was used as the selected EPC.
- **Stage 3:** Identifies appropriate SQOs for the following:
  - The protection of human health (construction workers and for the reuse of excavated soils)
  - The protection of ecological health
  - Waste classification criteria.
- **Stage 4:** Compares the EPCs against the adopted SQOs with the following considered:
  - If the EPCs are less than the SQO then human health or environmental risks are considered unlikely
  - Conversely if the EPC is greater than the SQO then human health or environmental risks may be possible
  - An *indicative* waste classification of the soils as per IWRG 621 (EPA Victoria, 2009a) will be determined. Note due to the low number of samples compared to the excavation volume, a complete waste classification cannot be determined at this stage.

Analytes of interest, i.e. contaminants that have been detected above laboratory limits of reporting, their associated EPC and adopted SQO have been summarised in Table 3.4.1 and 3.4.2 in section 3.4 Laboratory analysis below.

2.5.2 Risk characterisation – general

Risk characterisation is concerned with estimating the potential risks or hazards that could be presented to receptors at the site by comparing the exposure estimates determined as part of exposure assessment (i.e. the EPCs) to the corresponding exposure limits (i.e. the SQOs). If the exposure estimates are determined to be greater than the exposure limits, some prospect for adverse impact may exist and if this is the case these analytes are then termed Contaminants of Potential Concern (COPCs). The interpretation of the significance of

the exceedances involves the consideration of a number of factors, including the magnitude of the exceedance, the underlying basis of the selected exposure limit, and the overall degree of conservatism incorporated into the assessment.

2.5.3 Risk characterisation – human health

This section considers the potential for adverse health effects to occur from exposure of people (receptors) to AOI present in the surrounding soils. The characterisation of risk to human health considers the existing conditions but also assumes that similar effects might be seen when the soils are disturbed (such as during construction works). Soil quality objectives protective of human health are primarily defined with reference to the Amended NEPM Health Investigation Levels (HILs), interim HIL soil vapour values and Health Screening Levels (HSLs) for petroleum hydrocarbon compounds (NEPC, 2013). The HILs / HSLs are applicable for assessing human health risk via all relevant pathways of exposure and are generic to all soil types and apply generally to a depth of 3 m below the surface. HILs are intentionally conservative and are based on a reasonable worst-case scenario for four generic land use settings. These are:

- Residential A (HIL A) - Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake (no poultry), also includes childcare centres, preschools and primary schools
- Residential B (HIL B) – Residential with minimal opportunities for soil access; includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments
- Recreational C (HIL C) – Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. This does not include undeveloped public open space where the potential for exposure is lower and where a site-specific assessment may be more appropriate
- Commercial / Industrial (HIL D) – Commercial/industrial, includes premises such as shops, offices, factories and industrial sites.

Given construction workers may work in an exposed soil environment and HIL C represents a more intensive soil contact scenario Jacobs has selected HIL C to represent a “construction worker scenario”. This is likely to be highly conservative with respect to construction workers as it is based on a child receptor. Construction workers have a significantly greater body mass than a child, hence the toxicity of analytes of interest will be reduced compared to a child. For assessing risks arising from onsite soil reuse the commercial/industrial HIL D has been adopted.

Where SQO for AOI were not included within the Amended NEPM (NEPC, 2013), they were sourced from HEPA (2018), CRC CARE (2011) and United States Environmental Protection Authority Risk Screening Levels (US EPA, 2018). Whilst the US EPA approach to toxicity assessment is different, the basis of the toxicology and the general approach to the exposure calculations are similar to that used in Australia.

2.5.4 Risk characterisation – ecological receptors

This section considers potential risk to ecological health as a results of contact with AOI within surrounding soils. Soil quality objectives protective of ecological health are primarily defined with reference to the Amended NEPM Ecological Investigation Levels (NEPC, 2013). Similar to the HIL and HSL, Ecological Investigation Levels (EIL) and Ecological Screening Levels (ESL) are derived from different land use scenarios as well as specific soil physiochemical properties. These properties can include the cation exchange capacity, pH, percentage clay and grain size. For this site, a commercial industrial land use setting has been applied to determine SQO.

Where SQO for AOI were not included within the Amended NEPM (NEPC, 2013), they were sourced from HEPA (2018) and Ecological Benchmarks within the RAIS database (RAIS, 2018). Benchmarks chosen from RAIS (2018) include the US EPA Region 5 ESL and the Dutch intervention Soils Screening Benchmark. Whilst there is uncertainty applying the RAIS (2018) criteria to the Australian context, they are considered suitably conservative given the commercial/ industrial land use at this site, with the exception of the value for iron. The US EPA Region 4 ESLs provides a criterion for iron (200 mg/kg). This value is significantly lower than the typical concentration of iron (total) in Tertiary-Quaternary basalt (where the median ambient background levels in surface soils (0-0.1 m bgl) is approximately 33,600 mg/kg (Mikkonen et al, 2018). The US EPA Region IV

screening value for iron is therefore deemed not applicable to these results and has not been included in the ecological SQOs.

2.5.5 Indicative waste classification

The estimated volumes of soil for excavation at site are 32,234 m^3 for NAR (Jacobs, 2018) and 316,370 m^3 for Zulu (Jacobs, 2017a). These volumes combined is 348,604 m^3. As per EPA Victoria (2009b) guidance the minimum number of samples required to classify a volume of soil over 5000 m^3 is 1 sample per 250 m^3. Hence, a minimum of 1395 samples would be required in order to determine an IWRG 621 waste classification (EPA Victoria, 2009b). The Jacobs dataset consists of 129 primary samples collected over the 2014, 2015 and current 2018 investigations. Hence, only an indicative waste classification can be provided. To determine an indicative waste classification, results will be screened against the Industrial Waste Resource Guideline (IWRG) 621 Soil hazard categorisation and management (EPA Victoria, 2009a) and HEPA (2018).

3. Results

3.1 Site sampling observations

No obviously contaminated or unusual materials were observed in the 2018 sampling with the exception of one Zulu sampling location (ZULU_SS030) where the upper fill soils contained some fragments of brick. Field screening for volatiles using a photo ionisation detector (PID) was not completed due to the composite sampling method as described in section 2.3 above. Due to the volume of soil recovered and the focus of the investigation on contaminant of concern group PFAS, it was deemed acceptable to not use the PID. In the 2014 investigation, no indication of the presence of volatile organic compounds was made using a PID. Following on from this the 2015 investigation did not use a PID.

3.2 Encountered soils

Soils encountered during the 2018 sampling were predominantly natural basaltic clays. Fill soils, typically identified by the presence of coarse angular gravels, heterogeneous soils and (in once case) presence of brick fragments, were not as common and, where present, were restricted to the top ~0.4 m of sampling locations. Soils were mainly basalt derived silty clays overlying weathered basalt. A summary of the ground profile, as determined from the full dataset, is presented in Table 3.1. Detailed bore logs for 2018 samples are located in Appendix D.

Table 3.1: Summary of ground profile for Zulu and NAR using combined 2014, 2015 and 2018 dataset.

Typical thickness (mbgl)	Unit name	General description
0.0 – 0.4	Fill soils	FILL: Silty gravelly CLAY Brown, grey-brown with coarse gravels. Brick fragment observed in ZULU_SS030. Fill soils not present in all locations.
0.0 – 0.1	Top soil	TOPSOIL: Silty CLAY Black, brown and grey with frequent rootlets and trace fine sand. Soft to firm constancy
0.1 – 1.0	Natural	Silty, sandy CLAY Brown, grey-brown. Fine grain, stiff to very still with trace highly weathered basalt gravel/ floater fragment.
~1.0 and greater	Basalt	BASALT Brown, grey and orange extremely weathered low strength basalt rock.

3.3 Groundwater

Groundwater was not encountered in the course of the current 2018 investigation. Based on Jacobs previous work in the area it is anticipated that groundwater levels are at depths greater than 10 mbgl (Jacobs, 2017).

3.4 Laboratory analysis

Laboratory analytical results for the full dataset have been tabulated and are included in Appendix B at the end of this report. Laboratory documents such as results reports, chain of custody and quality reports are in Appendix E. Summary tables for analytes detected above laboratory limit of reporting (AOI) is presented below (Table 3.4.1 and 3.4.2). Green highlighted sections within these tables indicate analytes where the adopted EPC exceeds the SQO. These analytes are contaminants of potential concern and will be discussed further in section 4 below.

Table 3.4.1: Summary of total concentration AOI, associated EPC and adopted SQO for human health (HIL-C) – (Recreational) and ecological investigation levels (EIL) – (Commercial/Industrial) across the site for entire dataset.

AOI for soils - Total Concentration		EPC			SQO – Human Health		SQO - Ecology	
Analyte	Units	Max.	95% UCL		mg/kg	Source	mg/kg	Source
Per / poly fluorinated compounds								
Perfluorooctanesulfonic acid (PFOS)	mg/kg	0.032			1	1	0.14	2
Sum of PFAS (WA DER List)	mg/kg	0.032			NC	1	NC	2
Sum of PFHxS and PFOS	mg/kg	0.032			1	1	NC	2
Metals								
Arsenic	mg/kg	15			300	3	160	5
Chromium (III+VI)	mg/kg	89			300	3	660	8
Copper	mg/kg	40			17000	3	340	9
Iron	mg/kg	41000			55000	4	NC	
Lead	mg/kg	43			600	3	1800	10
Nickel	mg/kg		44.37		1200	3	960	11
Zinc	mg/kg	70			30000	3	1400	12
Inorganics								
pH (lab)	pH Units	7.7			NC		NC	
Fluoride	mg/kg	320			3100	4	NC	
Iron (%)	%	4.1			NC		NC	
pH (aqueous extract)	pH Units	8.6			NC		NC	
Total Organic Carbon	mg/kg	2800			NC		NC	
TRH - NEPM 2013 Fractions								
TRH >C10 - C16 (F2)	mg/kg	140			3800	5	170	13
TRH >C16 - C34 (F3)	mg/kg	120			5300	5	2500	13
TRH >C10 - C16 less Naphthalene (F2)	mg/kg	140			3800	5	170	13
TPH - NEPM 1999 Fractions								
TPH C10 - C14	mg/kg	120			NC		NC	
TPH C29-C36	mg/kg	110			NC		NC	
TPH C10 - C36 (Sum of total)	mg/kg	120			NC		NC	
Volatiles								
Ethylbenzene	mg/kg	0.6			NL	6	185	13
Toluene	mg/kg	0.1			NL	6	135	13
Xylene (m & p)	mg/kg	1.2			NC		NC	
Xylene (o)	mg/kg	0.6			NC		NC	
Xylene Total	mg/kg	1.8			NL	6	95	13
Polycyclic Aromatic Hydrocarbons								
Acenaphthene	mg/kg	4.9			3600	4	682	14
Polycyclic Aromatic Hydrocarbons								
Acenaphthylene	mg/kg	4.7			NC		682	14
Anthracene	mg/kg	4.6			18000	4	1480	14
Benz(a)anthracene	mg/kg	4.6			29	4	5.21	14

Benzo(a)pyrene TEQ (half LOR)	mg/kg	0.6			3	3	NC	
Benzo(a)pyrene TEQ (lower bound)*	mg/kg	0.5			3	3	NC	
Benzo(a)pyrene TEQ (medium bound)*	mg/kg	1.1			3	3	NC	
Benzo(a)pyrene TEQ (upper bound)*	mg/kg	1.7			3	3	NC	
Chrysene	mg/kg	4.7			110	4	4.73	14
Fluoranthene	mg/kg	5.3			2400	4	122	14
Fluorene	mg/kg	4.9			2400	4	122	14
Naphthalene	mg/kg	4.5			NL	6	370	7
Phenanthrene	mg/kg	4.7			NC		45.7	14
Pyrene	mg/kg	5.2			1800	4	78.5	14
PAHs (Sum of total)	mg/kg	**47**			300	3	**40**	15
Organochlorine Pesticides								
Aldrin + Dieldrin	µg/kg	70			10000	3	NC	
Dieldrin	µg/kg	70			NC		NC	

NC refers to no criteria available

NL refers to no limit within the available criteria. For example, at various depths and in different soil types in Table 1A(3) of the NEPM 2013 there are no limits listed for certain chemicals.

Criteria sources noted in table include:

1. PFAS NEMP 2018 Table 2: Soil criteria for investigation - human health based guidance values
2. PFAS NEMP 2018 Table 3: Soil criteria for investigation - ecological guidance values
3. NEPM 2013 Table 1A (1) HIL for soil Recreational C
4. US EPA Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=1) May 2018 Resident Soil
5. CRC Care (2011)
6. NEPM 2013 Table 1A(3) for recreational/ open space - clay
7. NEPM 2013 Table 1B(5) Genercil EIL for commercial/industrial
8. NEPM 2013 Table 1B(3) EIL for commercial/industrial clay % content >10
9. NEPM 2013 Table 1B(2) EIL for commercial/inducstrial CEC 60
10. NEPM 2013 Table 1B(4) EIL for commercial/industrial
11. NEPM 2013 Table 1B(3) EIL for commercial/industrial CEC 60
12. NEPM 2013 Table 1B (1) EIL for commercial/industrial CEC 60 and pH 7.0
13. NEPM 2013 Table 1B(6) ESL, Fine Soil, Commercial Industrial
14. RAIS - SO EPA R5 ESL Soil Screening Benchmark mg/kg
15. RAIS - Dutch Intervention Soils Screening Benchmark

Table 3.4.2: Summary of leachable concentration AOI, associated EPC and adopted SQO for ecological investigation levels (EIL) – (99% Species Protection) across the site for entire dataset.

AOI for soils – Leachable PFAS		EPC	EIL
Analyte	**Units**	**Max.**	**µg/L**
Perfluorooctanesulfonic acid (PFOS)	µg/L	**0.85**	**0.0023**
Perfluorooctanoic acid (PFOA)	µg/L	0.02	19
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	NC
Perfluorohexanoic acid (PFHxA)	µg/L	2	NC
Perfluorohexanesulfonic acid (PFHxS)	µg/L	0.13	NC
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.0001	NC
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	µg/L	0.04	NC

AOI for soils – Leachable PFAS		EPC	EIL
Analyte	Units	Max.	µg/L
Sum of PFAS	µg/L	0.89	NC
Sum of PFAS (WA DER List)	µg/L	0.88	NC
Sum of PFHxS and PFOS	µg/L	0.88	NC

All criteria in table sources from PFAS NEMP 2018 Table 5: Aquatic ecosystems: freshwater and marine water guideline values

3.5 Quality Assurance and Quality Control assessment

As discussed in section 1.4 above, previous data from the 2014 and 2015 investigations was assessed for quality in the Jacobs (2017) report. The 2018 QAQC program was in accordance with the recommended best practice as outlined in Standards Australia (2005). Overall review of the data shows it is sufficiently reliable for use in this assessment. Further details in regards to the 2018 QAQC program are outlined in Attachment C

4. Nature and extent of contamination

4.1 General

No obvious patterns in the distribution of contamination (both in the field or from analytical results) were present in the Jacobs (2017) report. After spatial analysis of the updated dataset, a preliminary pattern in the PFAS results has emerged, being:

- higher concentrations of PFAS (primarily PFOS and PFHxS) were observed in samples from NAR compared to Zulu; and
- higher concentrations of leachable PFAS (primarily PFOS and PFHxS) were observed with the deeper samples.
- PFOA was not detected above detection limits in any of the samples analysed.

This interpretation is drawn from the following trends observed in the data:

- Greater number of detects above LOR for total concentration of PFAS (PFOS) along the NAR (five detects) compared with Zulu (two detects)
- Greater number of detects above 0.07 µg/L for leachable PFAS (primarily PFOS and PFHxS) along NAR (ten detects) compared to Zulu (four detects). 0.07 µg/L was chose as it represents the lower limit of the clay/single composite lined criteria for landfill management in Table 6 of HEPA (2018).
- In six out of the eight locations where samples were collected at depth, the concentrations of leachable PFAS (primarily PFOS and PFHxS) are higher compared with the shallower sample in the same location. This is summarised in Table 4.1 below.

Table 4.1: Comparison of leachable PFAS (sum of PFHxS and PFOS) concentrations in shallow and deep soils within eight testing locations in the Zulu project area. Comparison shows trend of deeper samples having higher leachable concentrations of PFAS.

Location	Sampling depth (mbgl)	Sum of PFHxS and PFOS leachability (µg/L)	HEPA (2018) Table 6: Indicative landfill acceptance criteria classification
ZULU_SS007	0.4	<0.01	Below Detection Limit
	1.1	0.02	Unlined
ZULU_SS008	0.4	<0.01	Below Detection Limit
	1.2	0.02	Unlined
ZULU_SS009	0.3	<0.01	Below Detection Limit
	0.92	0.49	Clay/single composite lined
ZULU_SS010	0.6	<0.01	Below Detection Limit
	0.92	0.02	Unlined
ZULU_SS022	0.35	0.06	Unlined
	0.8	0.02	Unlined
ZULU_SS024	0.5	0.01	Unlined
	1.15	0.88	Double composite lined
ZULU_SS025	0.3	0.05	Unlined
	1.15	0.16	Clay/single composite lined
ZULU_SS031	0.29	0.03	Unlined
	0.8	<0.01	Below Detection Limit

4.2 Risk characterisation - human health

Soil analytical results have been assessed against selected criteria (SQO) for the protection of human health during construction (construction workers) and as part of soil re-use. The future use of the site is to remain part of the airport and hence a HIL-D commercial/industrial setting.

EPCs for all AOI are listed against SQO in Table 3.4.1 above. There were no exceedances of the adopted SQO for HIL – C (public open space/recreational). Risks to human health, both during construction and for re-use of the soils within the airport, as a result of expose to soils from within the NAR and Zulu area are unlikely.

4.3 Risk characterisation – ecological receptors

EPCs for all AOI are listed against ecological health SQO in Table 3.4.1 and 3.4.2 above. For all the identified AOI there were two COPC. These included Sum of polycyclic aromatic hydrocarbons (PAH) and PFAS. A summary of COPC and their associated risk to ecological receptors is in Table 4.3 below.

Table 4.3: Summary of risk from soil contaminants of potential concern with respect to ecological receptors

Contaminant of potential concern	Findings
Sum of polycyclic aromatic hydrocarbons (PAH)	In TP05 (from 2014 sampling round) there were two samples with 47.0 and 44.0 mg/kg Sum of PAH respectively. The adopted human health SQO for Sum of PAH is 40 mg/kg (sourced from the RAIS - Dutch Intervention Soils Screening Benchmark (RAIS, 2018)). 80 samples were analysed for Sum of PAH (from 2014, 2015 and 2018) and only the two listed in TP05 had concentrations above LOR. The remaining 78 samples were non detects (i.e. <0.5 mg/kg). Hence, the concentrations within TP05 can be treated as an isolated "hotspot" and the resultant risk to the environment is considered to be very low.
Perfluorooctanesulfonic acid (PFOS)	Samples from 2014, 2015 and 2018 were analysed for both total and leachable PFAS concentrations in soil. There were no exceedances of total concentration of PFAS (28 analytes) above the commercial/ industrial ecological criteria listed in Table 3: Soil criteria for investigation - ecological guidance values (HEPA, 2018). However, leachable concentrations of PFOS were detected in 47 samples (total 74 analysed). All 47 results are above the 99% species protection within Table 5 of HEPA (2018). The remaining 27 samples didn't have PFOS detected above the LOR (<0.01 µg/L). Note the LOR is greater than the PFOS criteria (0.00023 µg/L). A potential off-site receptor of the leachable PFOS is the Moonee Ponds Creek located approximately ~150 m to the east of the NAR. The risk to this receptor is considered possible based on the reported leachable PFOS concentrations. This investigation did not include any sampling of either groundwater or surface water within the Moonee Ponds Creek, hence the extent of this potential risk cannot be quantified here.

4.4 Indicative waste classification

The management of excavated soils is guided by IWRG 621 (EPA Victoria, 2009a), which requires soil to be categorised as one of Category A, B, C or Fill Material (i.e. clean fill) in order to determine what management options may be considered for that material. The waste characterisation process requires an assessment of the soil, and includes consideration of factors that influence the nature of the soil, such as site history and the source of the soil, i.e. whether or not the material is 'natural' and derived from underlying geology; or fill material that consists of reworked natural soils or material that has been imported from another location. Note, IWRG 621 does not include guidance on PFAS contamination within soils. An indicative classification is included within HEPA (2018). Currently in Victoria, there are no off-site facilities that will accept PFAS impacted soils for disposal and if soils are to be removed off-site EPA in the first instance should be contacted for advice.

Preferable to off-site waste disposal is reuse and ideally management of soils on-site. Jacobs understands that all soils will be retained onsite in a specifically engineered short to midterm stockpile area. Soils will later be re-used onsite..

Several concentration of nickel exceeded the Fill Material guidelines of 60 mg/kg. However, the 95% UCL of the mean concentration for nickel is 44.37 mg/kg which is below the Fill Material upper limit. In addition, it is highly likely the elevated individual concentrations of nickel are due to natural enrichment within the Tertiary Basalt from which the soils formed (McKinneon et al, 2018). Two pH readings (11.0 and 11.2) were outside of the Fill Material criteria (4-9). Of the 66 values tested, the median value was 7.7 with a standard deviation of 1.1. Hence, the applied EPC for this assessment is 7.7. Based on the available data the likely IWRG621 waste classification for soils from NAR and Zulu is Fill Material containing PFAS. Putting to one side the presence of PFAS, any spoil generated during constructions would be able to be reused on-site. The presence of the PFAS is the key issue that requires further consideration in the management of spoil within Zulu and NAR.

5. Conceptual site model

5.1 General

This Conceptual Site Model (CSM) is developed based on the documentary evidence summarised in previous sections of this report and incorporates the investigation data from 2014, 2015 and 2018 investigations. According to the Amended NEPM (NEPC, 2013), the essential elements of a CSM are:

- Identification of potential contamination and sources
- Identification of potential pathways and transport mechanisms
- Identification of sensitive receptors
- Assessment of potential and complete exposure pathways and preliminary risk assessment
- Data gap and uncertainty assessment.

A CSM is reliant on the quality of the data that is put into it. As previously mentioned, the data density at site is low, hence this is CSM is considered preliminary. The output of this CSM will provide a link to consideration of potential contaminated land management issues on the project.

5.2 Potential contamination sources

Table 1.1 above summarises the previous contaminants of potential concern. Section 4 above further refines this list based on current investigation and has reaffirmed the primary contaminant of concern for site is PFAS. The following are noted as potential sources of PFAS onsite:

- Storage and use of firefighting AFFF foams in emergency response training.
- Fill soils from on or off site used for levelling and construction activities

5.3 Pathways and transport mechanisms

A variety of pathways and physical, chemical, and biological transport mechanisms will influence the distribution of chemicals from their sources to locations throughout and beyond the site. Chemicals generally are transported via solution (i.e., dissolved in groundwater or surface water), particulate matter (i.e., chemicals sorbed to soils, sediments, or other particulate matter), as a vapour or gas or in biological matrices (i.e. bioaccumulated through food chain). The chemical forms (species) and phases in which they occur influence their transport, fate, and bioavailability. Each chemical's form and phase depends on its properties as well as local environmental conditions.

PFAS compounds are very soluble in water and the most important environmental migration pathway is through soil leaching processes into groundwater. They can also be transported in the air within suspended dust particles. PFAS does not fully degrade (such as benzene can degrade to carbon dioxide), however it will transform ultimately forming "dead-end PFAS compounds" (Concawe, 2016). These dead-end compounds are essentially recalcitrant within the environment.

At the airport, PFAS could be transported via both surface or groundwater. Permanent surface water bodies do not exist within the NAR and Zulu site. However, temporary ones may be generated for short periods of time after heavy rains etc. Where present, surface water will be focused into overland drainage channels and through other preferential pathways possibly created by installation of underground services. At site, these pathways were observed at intervals along the NAR and appear to drain in an easterly direction offsite towards the Moonee Ponds Creek.

Compared to over land flow or flow within surface water, transport of contaminants through groundwater is a slow process. In order for PFAS in soil to be transported into groundwater, surface water needs to percolate

through the soils, leach out and carry PFAS before then connecting up with groundwater aquifers where PFAS will readily be incorporated and transported. Factors such as the type of soil and depth to groundwater will influence the rate at which this process occurs. At site, the soils are mostly dense basaltic clays and depth to groundwater is anticipated to be greater than 10 mbgl. The dense clays have low hydraulic conductivity and will retard the flow of groundwater and any soluble contaminants.

Dust generation potential is more likely on parts of the site devoid of vegetation with dusts mobilised by the wind, by vehicles or during other earth moving activities. This dust can ultimately be deposited back to the ground generally in the direction of the prevailing winds, thus spreading the PFAS away from the original source. This pathway will depend on the characteristics of the surface soil and the atmospheric conditions. Construction earthworks activities on "dust generating days" can also mobilise PFAS within dust. This pathway is not considered very likely with the airport in its current condition, however with the forthcoming development, is more likely to be potential significant pathway.

The various fate and transport pathways possible for the site are summarised in Figure 5.1.

5.4 Sensitive receptors

An indication of potential receptors that might be impacted by PFAS at site has been determined by first reviewing the potential beneficial uses of the site. "Beneficial use" is defined in Section 2.03 of the Airports (Environment Protection) Regulations 1997 means a use of the environment or any element or segment of the environment which is:

- Conducive to public benefit, welfare, safety, health or aesthetic enjoyment, and which requires protection from the effects of waste discharges, emissions or deposits, or of the emission of noise; or

An element of the environment is any of the principal constituent parts of the environment including land, water, atmosphere, vegetation, climate, sound, odour, aesthetics, fish and wildlife.

. The following on and offsite receptors have been identified as part of this investigation:

- Construction workers related to upgrade of the NAR and Zulu and reuse of the soils.
- Ongoing exposure to the soils in the function of the airport (a commercial/industrial setting). The main receptors in this setting are maintenance workers onsite and onsite flora and fauna.
- The Moonee Ponds Creek. A surface water way located ~150-250m to the east of the NAR

5.5 Pollutant linkages

The final step in the CSM is a qualitative assessment of residual risk based on the previous steps. From this, recommendations will be formed for use in addressing any residual risk. The following residual risk can be assigned to complete the source, pathway and receptor linkages (from the CSM):

- **Very low and low:** no identifiable risks. No further action
- **Medium**: potential risks. Further assessment and / or mitigation and management measures to control as low as reasonably practicable (ALARP)
- **High and very high:** Further assessment and/or mitigation and management measures. Potentially urgent.

Risk to human health, including construction workers, maintenance staff and others associated with the ongoing use of the site, is deemed to be low. The complete linkage of source, receptor and pathway in this case is typified through disturbance of soils during construction works. Soils may come into contact with workers, such as dermal contact, inhalation of dust or accidental ingestion. Controls, such as personal protective equipment and dust control, will assist to reduce this risk. This will be further described in the PFAS Environmental Management Plan.

The linkage of leachable PFAS to groundwater and offsite water bodies (Moonee Ponds Creek) is conjectured as the current investigation has not evaluated the key components of this potential migration pathway (i.e. the

nature, disposition and quality of the groundwater). Based on the leachable concentrations of PFAS in soils being significantly higher than the adopted criteria (HEPA, 2018) there is a perceivable risk from the residual PFAS contamination in soils. Higher concentrations of leachable PFAS have been detected both at depth and within the NAR forming potential secondary sources of PFAS closer to the possible receptor with linkage pathways either being groundwater (at depth) or surface water runoff.

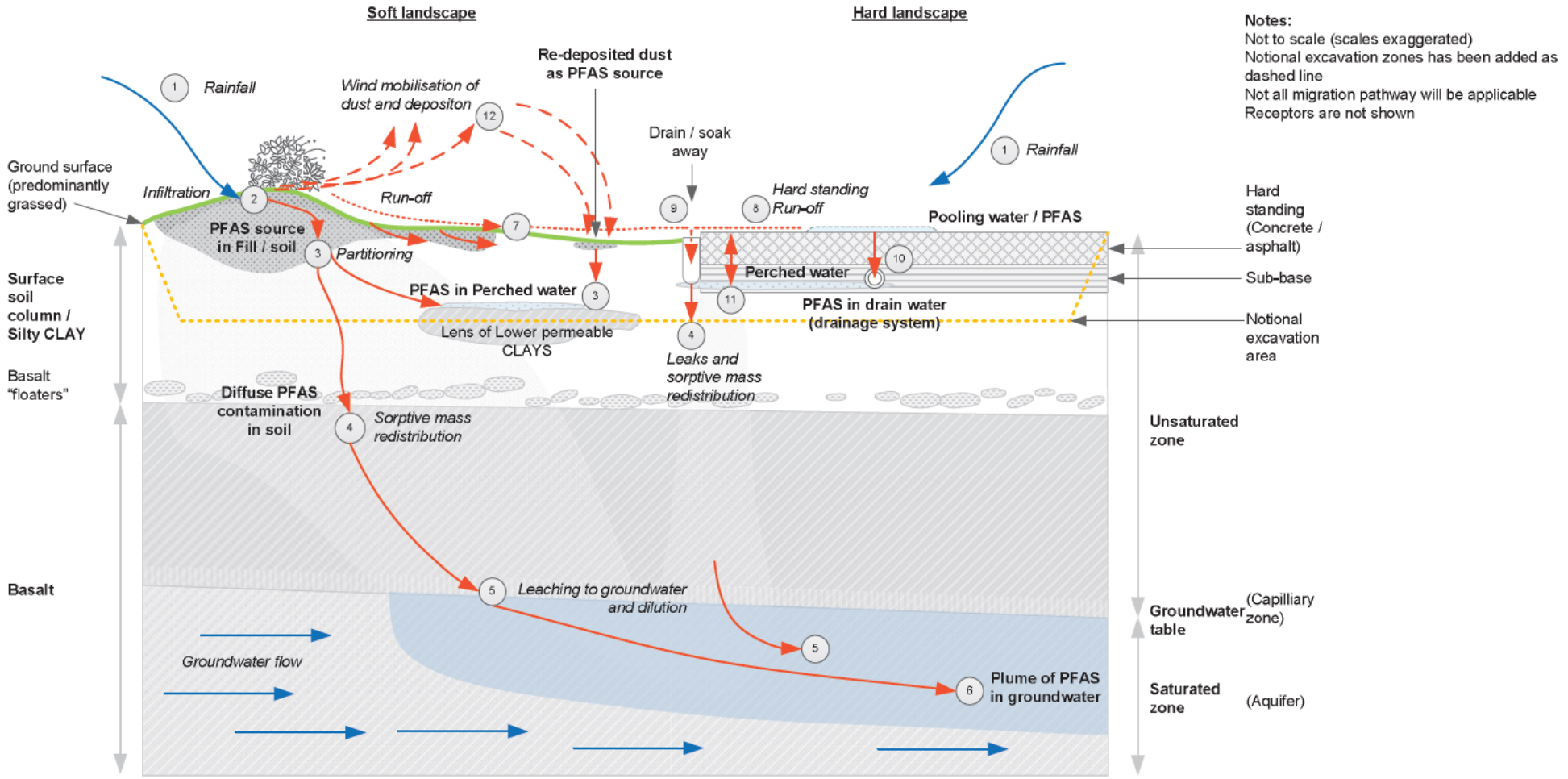
Based on the available information, the risk is currently considered by Jacobs to be medium, with further assessment required to better understand potential impact at the receptor and nature of the contaminant pathway.

5.6 Uncertainty assessment

The main uncertainty in this assessment relates to the scope of the investigations. The number of samples collected are sufficient for a "preliminary investigation" only (as opposed to a detailed investigation). Hence, conclusions drawn from this data will be of a preliminary nature. The following key data gaps have been identified:

- Horizontal spread of samples is limited
- Samples at depth (greater than ~0.5 mgbl) is limited to a handful of samples within the Zulu area
- No assessment of groundwater and hence, potential link of PFAS contamination from within soils is not understood
- No assessment of offsite Moonee Ponds receptor to enable determination of risk level

Figure 5.1: Conceptual site model with environmental transport mechanisms.



6. Conclusions and recommendations

6.1 Conclusions

Based on the 2014, 2015 and 2018 data collected from across NAR and Zulu, the key contaminant of concern requiring management is PFAS (primarily PFOS and PFHxS). Sum of PFOS and PFHxS (calculated) concentrations exceed the SQO for protection of ecological health and require further assessment.

The key conclusions with respect to risk from contaminated soils within the project area are:

- Spatial analysis of the total and leachable PFAS concentrations show there is a broad trend of higher concentrations being present along the NAR and at depth. Further sampling is required to better understand this distribution, and to inform management options for excavated soils.
- Comparison of soil chemistry to IWRG 621 criteria (EPA Victoria, 2009a) indicates that the likely waste classification of soils is Fill Material. Fill Material can typically be re-used on or off-site or disposed at an appropriate offsite facility. However, due to the presence of PFAS within the soils, the general Fill classification will not be applicable. Management of Fill containing PFAS off-site would require an initial consultation with EPA in order to discuss and agree on specific waste classification issues. Alternatively, spoil containing PFAS can be managed on-site (HEPA, 2018) and Jacobs understands that this is the preferred option for any spoil generated at the airport that contains PFAS.
- The risk to human health as a result of exposure to NAR and Zulu soils is considered to be low. With implementation of a construction environmental management plan (including items such as use of PPE, dust control etc.), this risk is likely to be reduced
- The risk to environmental health is not fully understood. Based on leachable concentrations of PFAS, there may be a risk to offsite receptors within the Moonee Ponds Creek. Further investigation is required.

6.2 Recommendations



7. References

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Appendix A. Sampling location plans

A.1 Sampling location plan for 2014, 2015 and 2018 data

A.2 PFAS total concentration results

A.3 PFAS leachable concentration results

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Appendix B. Results tables

B.1 Table 1. All Data compared to IWRG 621 criteria (not including PFAS)

B.2 Table 2. PFAS total concentration compared to HEPA (2018) criteria

B.3 Table 3. PFAS leachable concentrations compared to HEPA (2018) Landfill acceptance criteria

B.4 Table 4. PFAS leachable concentrations compared to HEPA (2018) EIL 99% species protection criteria

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Appendix C. Laboratory QAQC

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Laboratory analysis data validation checklist

Project and data details			
Project number	IS025200-550	**Client**	APAM
Site	Melbourne Airport	**Laboratory report number**	591613
Validated by	[redacted]	**Matrix type/s**	Soil and water (rinsate)
Validation date	04/04/2018, 26/04/2018	**Primary laboratory**	Eurofins - 591613
Sampling date range	26-27/03/2018	**Secondary laboratory**	ALS – EM1805367

Field QAQC			
Correct sample naming on COC?	Primary: Yes; Secondary: Yes		
Correct sample naming in laboratory SRN?	Primary: Yes; Secondary: No, NAR-QAQC…. As opposed to NAR_QAQC…. Asked lab to correct 04/04/2018		
Analysis on COC correct compared to project SAQP?	Primary: Yes; Secondary: Yes		
Analysis on SRN correct as compared to COC?	Primary: Yes; Secondary: Yes		
All samples received intact and within acceptable temperature range?	Primary: Yes; Secondary: Yes		
Were field blank/s collected?	Yes: ZULU_R1_270318	**Do field blank/s results meet criteria?**	Yes
Trip blank/s collected?	Yes: sb3980, for BTEX and TPH C6-10	**Do trip blank/s results meet criteria?**	N/A not analysed
Intra and inter laboratory duplicate/s?	Yes: NAR_QAQC1_270318 NAR_QAQC2_270318	**Do duplicate results meet criteria?**	Yes

Laboratory QAQC	
Do samples meet analysis holding times?	Primary: Yes; Secondary: Yes
Do analytes reported in COA match SRN?	Primary: Yes; Secondary: Yes
Is internal laboratory QAQC frequency adequate?	Primary: Yes; Secondary: Yes
Are all results below LOR for method blanks?	Primary: Yes; Secondary: Yes
Are laboratory duplicate RPD < 30%?	Primary: Fail for TRH C10-C14 and TRH>C10-C16, only slightly over (1-2%) and within Eurofins internal limits.; Secondary: Yes
Are laboratory control spikes/standards within laboratory specified ranges?	Primary: Fail for TRH C10-C14 and TRH>C10-C16. Acceptable recovery of laboratory control sample indicating a matrix interference. ; Secondary: Yes
Are laboratory matrix spike recoveries within laboratory specified ranges?	Primary: Yes ; Secondary: No, poor matrix spike recovery for total mercury due to clay sample matrix, 68.9% (recovery limits 76-116%). Lab confirmed result by re-extraction and re-analysis.
Are surrogate spikes recoveries within laboratory specified ranges?	Primary: Yes; Secondary: Yes

Comments

List of acronyms:

COC – Chain of custody

LOR – Limit of reporting

RPD – Relative percentage difference

SAQP – Sample analysis quality plan

SRN – Service recipient notice

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Laboratory analysis data validation checklist

Project and data details			
Project number	IS025200-550	**Client**	APAM
Site	Melbourne Airport	**Laboratory report number**	591863
Validated by	[redacted]	**Matrix type/s**	Soils and water (rinsate)
Validation date	04/04/2018	**Primary laboratory**	Eurofins – 591863
Sampling date range	28/03/2018	**Secondary laboratory**	ALS – EM1805575

Field QAQC			
Correct sample naming on COC?	Primary: Yes; Secondary: Yes		
Correct sample naming in laboratory SRN?	Primary: No, trip blank 563982 as opposed to SB3982 sent email to correct 04/04/2018; Secondary: Yes		
Analysis on COC correct compared to project SAQP?	Primary: Yes; Secondary: Yes		
Analysis on SRN correct as compared to COC?	Primary: Yes; Secondary: Yes		
All samples received intact and within acceptable temperature range?	Primary: Yes; Secondary: Yes		
Were field blank/s collected?	Yes: ZULU_R1_280318	**Do field blank/s results meet criteria?**	Yes
Trip blank/s collected?	Yes: sb3982	**Do trip blank/s results meet criteria?**	N/A, not analysed
Intra and inter laboratory duplicate/s?	Yes: NAR_QAQC1_280318 NAR_QAQC2_280318	**Do duplicate results meet criteria?**	Yes

Laboratory QAQC	
Do samples meet analysis holding times?	Primary: Yes; Secondary: Yes
Do analytes reported in COA match SRN?	Primary: Yes; Secondary: Yes
Is internal laboratory QAQC frequency adequate?	P Primary: Yes; Secondary: Yes
Are all results below LOR for method blanks?	Primary: Yes; Secondary: Yes
Are laboratory duplicate RPD < 30%?	Primary: TRH C6-C10 32% for water (acceptable value is 30% or less); Secondary: Yes
Are laboratory control spikes/standards within laboratory specified ranges?	Primary: Yes; Secondary: Yes
Are laboratory matrix spike recoveries within laboratory specified ranges?	Primary: Fluoride at 66% in soils (acceptable range is 70-130%); Secondary: PFOS not determined, background levels > or = 4x matrix spike level. Verified in total concentration results, detect for PFOS.
Are surrogate spikes recoveries within laboratory specified ranges?	Primary: Yes; Secondary: Yes

Comments

List of acronyms:

COC – Chain of custody

LOR – Limit of reporting

RPD – Relative percentage difference

SAQP – Sample analysis quality plan

SRN – Service recipient notice

JACOBS

Laboratory analysis data validation checklist

Project and data details			
Project number	IS025200-550	**Client**	APAM
Site	Melbourne Airport	**Laboratory report number**	591925
Validated by	[redacted]	**Matrix type/s**	Soils and water (rinsate)
Validation date	04/04/2018, 26/04/2018	**Primary laboratory**	Eurofins – 591925
Sampling date range	29/03/2018	**Secondary laboratory**	ALS – EM1805584

Field QAQC			
Correct sample naming on COC?	Primary: Yes; Secondary: Yes		
Correct sample naming in laboratory SRN?	Primary: Yes; Secondary: Yes		
Analysis on COC correct compared to project SAQP?	Primary: Yes; Secondary: Yes		
Analysis on SRN correct as compared to COC?	Primary: No, unable to do PFAS leachate analysis on rinsate, lab sent through correction; Secondary: Yes		
All samples received intact and within acceptable temperature range?	Primary: Yes; Secondary: Yes		
Were field blank/s collected?	Yes: ZULU_R1_290318	**Do field blank/s results meet criteria?**	Yes
Trip blank/s collected?	Yes: SB3981, SB3984	**Do trip blank/s results meet criteria?**	N/A not analysed
Intra and inter laboratory duplicate/s?	Yes: ZULU_QAQC1_290318 ZULU_QAQC2_290318	**Do duplicate results meet criteria?**	Yes

Laboratory QAQC	
Do samples meet analysis holding times?	Primary: Yes; Secondary: Yes
Do analytes reported in COA match SRN?	Primary: Yes; Secondary: Yes
Is internal laboratory QAQC frequency adequate?	Primary: Yes; Secondary: Yes
Are all results below LOR for method blanks?	Primary: Yes; Secondary: Yes
Are laboratory duplicate RPD < 30%?	Primary: TRH C6-C10 32% (target range 30% and under), however within lab limits; Secondary: Yes
Are laboratory control spikes/standards within laboratory specified ranges?	Primary: Yes; Secondary: Yes
Are laboratory matrix spike recoveries within laboratory specified ranges?	Primary: Cyanide 62% (range 70-130% target), Lead 132% (75-125% target), for both an acceptable recovery was achieved for laboratory control sample indicating a sample matrix influence.; Secondary: PFOS not determined, background levels > or = 4x matrix spike level. Verified in total concentration results, detect for PFOS.
Are surrogate spikes recoveries within laboratory specified ranges?	Primary: Yes; Secondary: Yes

Comments

List of acronyms:

COC – Chain of custody

LOR – Limit of reporting

RPD – Relative percentage difference

SAQP – Sample analysis quality plan

SRN – Service recipient notice

JACOBS

Laboratory analysis data validation checklist

Project and data details			
Project number	IS025200	**Client**	APAM
Site	Melbourne Airport	**Laboratory report number**	595728
Validated by	[redacted]	**Matrix type/s**	Soil
Validation date	27/04/2018 and 21/05/2018	**Primary laboratory**	Eurofins
Sampling date range	27-29/03/2018	**Secondary laboratory**	ALS (N/A)

Field QAQC			
Correct sample naming on COC?	Primary: Yes		
Correct sample naming in laboratory SRN?	Primary: Yes		
Analysis on COC correct compared to project SAQP?	Primary: Yes		
Analysis on SRN correct as compared to COC?	Primary: Yes		
All samples received intact and within acceptable temperature range?	Primary: Yes		
Were field blank/s collected?	No, samples previously on HOLD.	**Do field blank/s results meet criteria?**	N/A
Trip blank/s collected?	No, samples previously on HOLD.	**Do trip blank/s results meet criteria?**	N/A
Intra and inter laboratory duplicate/s?	No, samples previously on HOLD.	**Do duplicate results meet criteria?**	N/A

Laboratory QAQC	
Do samples meet analysis holding times?	Yes
Do analytes reported in COA match SRN?	Yes
Is internal laboratory QAQC frequency adequate?	Yes
Are all results below LOR for method blanks?	Yes
Are laboratory duplicate RPD < 30%?	Yes
Are laboratory control spikes/standards within laboratory specified ranges?	Yes
Are laboratory matrix spike recoveries within laboratory specified ranges?	Yes
Are surrogate spikes recoveries within laboratory specified ranges?	Yes

Comments
Samples were previously on hold. Have been analysed now for PFAS and PFAS leachability only.

List of acronyms:

COC – Chain of custody

LOR – Limit of reporting

RPD – Relative percentage difference

SAQP – Sample analysis quality plan

SRN – Service recipient notice

Appendix D. Soil bore logs

DRAFT

JACOBS

Location ID: NAR_SS035

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Northern Access Route
Job No: IS025200
Start - Finish Date: 28/03/2018 - 28/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty CLAY (CL) Brown medium plasticity clay, fine silt and clay	D	S - F	
NAR_SS035_0.55	●	0	A	-				Some coarse sub angular gravel up to 8mm diameter. Roots extent to 0.45m			
								Orange-brown and grey. Medium plasticity			% Clay NEPM sample collected at 0.55 m
						1		Hole terminated on target at 1.1m No groundwater and no visible contamination			

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
× = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: NAR_SS036A

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Northern Access Route
Job No: IS025200
Start - Finish Date: 28/03/2018 - 28/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass and gravel
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
NAR_SS036A_0.3	●	0	A	-				FILL: Silty GRAVEL Coarse angular gravel up to 2cm diameter (basalt) Grey-brown fine silt. Some roots to 15cm	L	D	
						1		Hole terminated before target due to refusal No groundwater and no visible contamination			

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: NAR_SS038

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Northern Access Route
Job No: IS025200
Start - Finish Date: 26/03/2018 - 26/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked: GS

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								CLAY (CL) Brown to dark brown low plasticity clay Roots down to 0.2m	St	Sl.M	
NAR_SS038_0.2	●	0	A	-							Basalt rock fragment 2 cm Grass and roots to 0.2 m
						1		Hole terminated at 0.5m due to refusal on rock. No groundwater and no visible contamination			

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: NAR_SS039

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Northern Access Route
Job No: IS025200
Start - Finish Date: 28/03/2018 - 28/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty CLAY (CL) Brown low-medium plasticity fine grain clay. Roots to 40cm depth	S	D	
NAR_SS039_0.4	●	0	A	-							
								Some well rounded quartz sand up to 2mm diameter.			
								Grey-light grey.			
						1		Hole terminated on target at 1.0m No groundwater and no visible contamination			

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
× = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: NAR_SS040

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Northern Access Route
Job No: IS025200
Start - Finish Date: 28/03/2018 - 28/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
NAR_SS040_0.6	●	0	A	-				FILL: Gravelly silty CLAY (CL) Brown - orange brown low-medium plasticity clay. Fine grain clay. Coarse angular gravel up to 4cm diameter (basalt), Medium grain silt. Roots down to 45cm.	S-F	D	
								Silty CLAY (CL) Brown - orange low-medium plasticity clay. Fine grain clay and silt.	F		
						1		Hole terminated before target due to refusal No groundwater and no visible contamination			

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: NAR_SS041

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Northern Access Route
Job No: IS025200
Start - Finish Date: 28/03/2018 - 28/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty gravelly CLAY (CL) Grey-brown low-medium plasticity clay. Fine grain. Some fine grain gravel (basalt). Roots down to 40cm	D	S	
NAR_SS041_0.4	●	0	A	-							
								Hole terminated before target due to refusal No groundwater and no visible contamination			
						1					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: NAR_SS042

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Northern Access Route
Job No: IS025200
Start - Finish Date: 27/03/2018 - 27/03/2018

Bore dia: 40 mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								CLAY (CL) Brown - orangy brown low-medium plasticity fine grain. Roots down to 40cm	S	Sl. M	
									F	D	
NAR_SS042_0.4	●	0	A	-							
								Soil more competent/ less crumbly	St	D	% Clay NEPM sample collected at 0.4 m
								Hole terminated before target due to refusal No groundwater and no visible contamination			
						1					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
× = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: NAR_SS043

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Northern Access Route
Job No: IS025200
Start - Finish Date: 27/03/2018 - 27/03/2018

Bore dia: 40 mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
NAR_SS043_0.4	●	0	A	-				Silty sandy CLAY (CL) Brown - grey brown low-medium plasticity clay. Fine grain. Some coarse sand up to 2mm diameter. Top 3cm of hole more silty. Some roots	S	Sl. M	
								CLAY (CL) Brown - orange brown fine grain, medium-high plasticity.	St	D	
						1		Gravelly CLAY (CL) Highly weathered basalt. Grey- grey brown basalt fragements up to 1cm diameter Hole terminated before target due to refusal No groundwater and no visible contamination			

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: NAR_SS044

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Northern Access Route
Job No: IS025200
Start - Finish Date: 27/03/2018 - 27/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty CLAY (CL) Grey-brown medium plasticity fine grain clay Roots down to 0.25 Minor fine grain silt in top 3 cm	S	SI.M	
NAR_SS045_0.4	●	0	A	-							
								CLAY (CL) Grey brown med to high plasticity clay fine grain	S	SI.M	
								CLAY (CL) Grey highly weathered basalt rock Fine grain	St	D	
								Hole terminated due to refusal on rock at 0.8m No groundwater and no visible contamination			
						1					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: NAR_SS045

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Northern Access Route
Job No: IS025200
Start - Finish Date: 27/03/2018 - 27/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty gravelly CLAY (CL) Brown low-med plasticity clay fine grain Some Fine grain well rounded gravels (2-3mm diameter) Roots down to 0.3mm	F	Sl.M	
NAR_SS045_0.6	●	0	A	-							
								CLAY (CL) Light grey fine grain highly weathered rock	St	D	
								Hole terminated due to refusal on rock at 0.72 m No groundwater and no visible contamination			
						1					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
× = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: NAR_SS046

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Northern Access Route
Job No: IS025200
Start - Finish Date: 27/03/2018 - 27/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								CLAY (CL) Brown low-med plasticity clay Some roots down to 0.35 m Fine grain clay	MD	Sl.M	
NAR_SS046_0.6	●	0	A	-							
								No more roots, sample much more compact	St	D	
								Hole terminated before target due to refusal on rock at 0.6m No groundwater and no visible contamination			
						1					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: NAR_SS047

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Northern Access Route
Job No: IS025200
Start - Finish Date: 27/03/2018 - 27/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty CLAY (CL) Brown low plasticity, fine grain Some roots	S	Sl.M	
NAR_SS047_0.4	●	0	A	-				Silty CLAY (CL) Light grey-brown Low plasticity, fine grain	F	D	
						1		Hole terminated before target due to refusal No groundwater and no visible contamination			

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: NAR_SS048

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Northern Access Route
Job No: IS025200
Start - Finish Date: 27/03/2018 - 27/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								CLAY (CL) Grey brown low-medium plasticity clay. Fine grain Some roots down to 10cm	F	Sl.M	
NAR_SS048_0.4	●	0	A	-	NAR_QAQC1_270318, NAR_QAQC2_270318						
NAR_SS048_0.8	●	0	A	-				Increse to medium plasticity from 0.8m			% Clay NEPM sample collected at 0.8 m
						1		Hole terminated at 1.15m on target. No groundwater and no visible contamination			

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
× = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: NAR_SS049

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Northern Access Route
Job No: IS025200
Start - Finish Date: 28/03/2018 - 28/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty gravelly CLAY (CL) Grey - brown low plasticity fine clay. Trace angular gravel up to 1cm diameter. Roots down to 40cm	D	F	
NAR_SS049_0.4	●	0	A	-							
								Hole terminated before target due to refusal No groundwater and no visible contamination			
						1					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: NAR_SS050

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Northern Access Route
Job No: IS025200
Start - Finish Date: 28/03/2018 - 28/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								FILL: Silty gravelly CLAY (CL) Grey-brown low plasticity clay. Coarse angular gravel up to 3cm diameter. Roots down to 30cm	S	D	
NAR_SS050_0.4	●	0	A	-							
								Silty CLAY (CL) Brown - grey brown medium plasticity clay. Some coarse quartz sand (up to 2mm diameter)	St		
						1		Hole terminated before target due to refusal No groundwater and no visible contamination			

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS001

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 28/03/2018 - 28/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty sandy CLAY (CL) Brown low-medium plasticity fine clay. Fine silt and coarse sand up to 2mm diameter	S	D	
ZULU_SS001_0.4	●	0	A	-							
									F		
								Roots down to 0.5m			
						1		Hole terminated on target at 1.02m No groundwater and no visible contamination			

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS002

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 28/03/2018 - 28/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty sandy CLAY (CL) Brown medium plasticity clay. Fine grain silt and clay, coarse grain sand up to 2mm diameter. Roots down to 37cm	S	D	
									F		
ZULU_SS002_0.4	●	0	A	-							
								Hole terminated before target due to refusal No groundwater and no visible contamination			
						1					

VISUAL RANKING
- 0 No visible evidence of contamination
- 1 Slight visible contamination
- 2 Visible contamination
- 3 Significant visible contamination

ODOUR RANKING
- A No Non-Natural odours
- B Slight Non-Natural odours
- C Moderate Non-Natural odours
- D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
× = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS003

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 28/03/2018 - 28/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty sandy CLAY (CL) Grey-brown low-medium plasticity clay. Fine grain silt and clay, coarse sand up to 2mm diameter, well rounded	F	D	
ZULU_SS003_0.4	●	0	A	-							
						1		Hole terminated on target at 1.15m No groundwater and no visible contamination			

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS004

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 28/03/2018 - 28/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty gravelly CLAY (CL) Brown low-medium plasticity clay. Fine grain silt and clay, coarse angular gravel up to 3 cm diameter	S	D	
ZULU_SS004_0.24	●	0	A	-							Basalt outcrop observed nearby (~30 m away). Low sample volume
								Hole terminated before target due to refusal No groundwater and no visible contamination			
						1					

VISUAL RANKING
- 0 No visible evidence of contamination
- 1 Slight visible contamination
- 2 Visible contamination
- 3 Significant visible contamination

ODOUR RANKING
- A No Non-Natural odours
- B Slight Non-Natural odours
- C Moderate Non-Natural odours
- D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS005

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 28/03/2018 - 28/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
ZULU_SS005_0.11	●	0	A	-				Silty sandy CLAY (CL) Brown medium plasticity fine clay. Coarse grain sand up to 2mm diameter. Roots throuhgout	S	D	Basalt outcrop approximatly 5m away. Low sample volume, only analysed for PFAS
						1		Hole terminated before target due to refusal No groundwater and no visible contamination			

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
× = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS006

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 28/03/2018 - 28/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty gravelly CLAY (CL) Brown - dark brown medium plasticity clay. Fine silt and some gravel up to 5mm diameter. Some roots	S	D	
								Silty gravelly SAND (SM) Light grey - brown fine grain sand . Coarse gravel up to 3cm diameter	L		Rock outcrop nearby ~ (10-15 m away)
ZULU_SS006_0.45	●	0	A	-							Low sample volume
						1		Hole terminated before target due to refusal No groundwater and no visible contamination			

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS007

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 28/03/2018 - 28/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty gravelly CLAY (CL) Brown medium plasticity fine clay. Gravel up to 8mm diameter, subangular	S	D	
ZULU_SS007_0.4	●	0	A	-							
								Clayey SAND (SM) Light grey medium to coarse sand. Some qtz up to 1-2mm diameter, low palsticity clay	L	D	
ZULU_SS007_1.1	●	0	A	-							
						1					
								Hole terminated on target at 1.1m No groundwater and no visible contamination			

VISUAL RANKING

0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING

A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS008

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 28/03/2018 - 28/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty gravelly CLAY (CL) Brown medium plasticity clay. Fine grain gravel up to 3mm diameter. Roots to 0.5m	S-F	D	
ZULU_SS008_0.4	●	0	A	-							
								Silty gravelly SAND (SM) Light brown-grey medium-fine sand	L		
ZULU_SS008_1.2	●	0	A	-		1					
								Hole terminated on target at 1.2m No groundwater and no visible contamination			

VISUAL RANKING

0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING

A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS009

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 28/03/2018 - 28/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
ZULU_SS009_0.4	●	0	A	-				FILL: Silty gravelly CLAY (CL) Grey brown low-medium plasticity clay. Medium gravel up to 1cm diameter	S	D	
ZULU_SS009_0.92	●	0	A	-				Sandy CLAY (CL) Distinct colour change to brown medium plasticity clay. Coarse sand up to 2mm diameter	F		
						1		Hole terminated before target due to refusal No groundwater and no visible contamination			

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS010

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 29/03/2018 - 29/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								CLAY (CL) Brown low plasticity. Roots to 50cm	S	D	
ZULU_SS010_0.6	●	0	A	-	ZULU_QAQC1_290318, ZULU_QAQC2_290318						QAQC samples for PFAS jar only due to low sample volume
ZULU_SS010_1.12	●	0	A	-		1		Gravelly SAND (SM) Light grey fine grain sand. Fine grain gravel up to 4mm diameter	L	D	Low glass jar sample volume
								Hole terminated on target at 1.12m No groundwater and no visible contamination			

VISUAL RANKING

0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING

A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS011

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 29/03/2018 - 29/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								FILL: Silty gravelly CLAY (CL) Dark brown low plasticity clay. Coarse angular gravel up to 3cm diameter Roots down to 30cm	S	D	
ZULU_SS0011_0.4	●	0	A	-				Silty sandy CLAY (CL) Brown low-medium plasticity clay. Some coarse sand up to 2mm diameter			
									F		
						1		Hole terminated before target due to refusal No groundwater and no visible contamination			

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS012

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 29/03/2018 - 29/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty gravelly CLAY (CL) Dark brown-brown low-med plasticity clay. Coarse gravel (basalts) up to 1cm diameter. Roots to 35cm	S	D	
ZULU_SS0012_0.4	●	0	A	-							
								Some sand up to 3mm	F		
								Hole terminated before target due to refusal No groundwater and no visible contamination			
						1					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS013

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 29/03/2018 - 29/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
ZULU_SS0013_0.3	●	0	A	-				Silty SAND (SM) Light brown fine grain sand	L	D	
								CLAY (CL) Brown low plasticity. Roots to 0.55m	F		
								Some coarse sand			
						1		Hole terminated before target due to refusal No groundwater and no visible contamination			

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS014

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 29/03/2018 - 29/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Clayey SAND (SM) Grey brown fine grain sand low plasticity clay. Roots to 0.45m	L	D	
ZULU_SS0014_0.4	●	0	A	-				Sandy CLAY (CL) Brown low-medium plasticity clay. Coarse sand up to 2mm diameter	St-F		% Clay NEPM sample collected at 0.4 m
						1		Hole terminated on target at 1.16m No groundwater and no visible contamination			

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS015

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 29/03/2018 - 29/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty sandy CLAY (CL) Brown moderate-high plasticity clay. Coarse sand up to 2mm diameter, roots to 40cm	F-St		
ZULU_SS0015_0.4	●	0	A	-							
						1		Hole terminated before target due to refusal No groundwater and no visible contamination			

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS016

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 29/03/2018 - 29/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Sandy CLAY (CL) Light brown low plasticity clay. Fine grain sand roots to 0.38m	S	D	
ZULU_SS0016_0.4	●	0	A	-				Sandy CLAY (CL) Brown low-moderate plasticity clay. Coarse sand	F		
								Silty SAND (SM) Grey cream fine grain sand	L	D	
								Sandy CLAY (CL) Grey brown moderate-high plasticity clay. Coarse sand up to 2mm diameter	St		
						1		Hole terminated before target due to refusal No groundwater and no visible contamination			

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
× = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS017

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 29/03/2018 - 29/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty sandy CLAY (CL) Brown low-medium plasticity clay. Medium-coarse sand up to 2mm diameter Roots to 45cm.	S - F	D	
ZULU_SS0017_0.4	●	0	A	-							
						1		Grey-brown			
								Hole terminated on target at 1.17 m No groundwater and no visible contamination			

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS020

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 29/03/2018 - 29/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
ZULU_SS0020_0.4	●	0	A	-				Silty gravelly CLAY (CL) Brown low-moderate plasticity clay. Sand up to 2mm diameter, angular gravel up to 8mm diameter. Roots to 0.45m	S-F	D	
								Silty SAND (SM) White-light grey fine grain sand and silt	D		
						1		Hole terminated before target due to refusal No groundwater and no visible contamination			

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
× = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS021

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 29/03/2018 - 29/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Sandy CLAY (CL) Brown medium plasticity clay. Fine to medium sand. Roots to 0.26m	S	D	
ZULU_SS0021_0.26	●	0	A	-				Gravelly SAND (SM) Grey brown fine grain sand and fine - medium gravel up to 8mm diameter	L		Low sample volume
						1		Hole terminated before target due to refusal No groundwater and no visible contamination			

VISUAL RANKING
- 0 No visible evidence of contamination
- 1 Slight visible contamination
- 2 Visible contamination
- 3 Significant visible contamination

ODOUR RANKING
- A No Non-Natural odours
- B Slight Non-Natural odours
- C Moderate Non-Natural odours
- D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS022

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 29/03/2018 - 29/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								FILL: Gravelly CLAY (CL) Medium plasticity clay. Coarse subangular gravel up to 4cm. Roots to 0.35m	L	D	
ZULU_SS0022_0.35	●	0	A	-							
								Sandy CLAY (CL) Brown-grey brown moderste plasticity clay. Coarse sand up to 2mm diameter.	F-St		
ZULU_SS0022_0.8	●	0	A	-							
						1		Hole terminated before target due to refusal No groundwater and no visible contamination			

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
× = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS024

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 27/03/2018 - 27/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty CLAY (CL) Brown low-medium plasticity clay. Fine clay and silt, some angular gravel at 0.1m. Roots to 0.4m	F	Sl.M	
ZULU_SS0024_0.5	●	0	A	-							% Clay NEPM sample collected at 0.5 m
								Up to 2cm diameter basalt gravel	St	D	
								Light grey-grey brown			
						1					
ZULU_SS0024_1.15	●	0	A	-							
								Hole terminated on target at 1.15m No groundwater and no visible contamination			

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
× = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS025

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 27/03/2018 - 27/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty gravelly CLAY (CL) Grey brown low-medium plasticity clay. Fine clay and silt and fine gravel up to 3 mm diameter, well rounded. Roots to 35 cm	St	D	
ZULU_SS0025_0.3	●	0	A	-							
								Slight increase in gravel amount			
ZULU_SS0025_1.15	●	0	A	-		1					
								Hole terminated on target at 1.15m No groundwater and no visible contamination			

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS026

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 27/03/2018 - 27/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty gravelly CLAY (CL) Grey brown low plasticity clay. Fine clay and silt, gravel up to 3mm diameter	F	D	
ZULU_SS0026_0.4	●	0	A	-							
								Increase in gravel. Gravel up to 3cm diameter, well rounded			
						1		Hole terminated before target due to refusal No groundwater and no visible contamination			

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
× = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS027

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 27/03/2018 - 27/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty gravelly CLAY (CL) Grey brown medium plasticity clay. Fine clay and silt, gravel up to 3mm diameter, well rounded. Roots to 0.4m	F	D	
ZULU_SS0027_0.4	●	0	A	-							% Clay NEPM sample collected at 0.4 m
						1		Slight increase in gravel			
								Hole terminated on target at 1.16m No groundwater and no visible contamination			

VISUAL RANKING
- 0 No visible evidence of contamination
- 1 Slight visible contamination
- 2 Visible contamination
- 3 Significant visible contamination

ODOUR RANKING
- A No Non-Natural odours
- B Slight Non-Natural odours
- C Moderate Non-Natural odours
- D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
× = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS028

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 27/03/2018 - 27/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty gravelly CLAY (CL) Grey brown low-medium plasticity clay. Fine clay and silt, gravel up to 3mm diameter.	S	D	
ZULU_SS0028_0.4	●	0	A	-				More compacted/stiffer clay	St		
						1		Hole terminated on target at 1.10m No groundwater and no visible contamination			

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS029

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 27/03/2018 - 27/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty gravelly CLAY (CL) Brown -grey brown medium-high plasticity clay. Fine clay and silt, fine gravel up to 3mm diameter, rounded.	F-S	SI.M	
ZULU_SS0029_0.4	●	0	A	-							
						1		Hole terminated on target at 0.97m No groundwater and no visible contamination			

VISUAL RANKING

0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING

A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS030

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 29/03/2018 - 29/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION			COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								FILL: Sandy Silty CLAY (CL) Brown high-moderate plasticity clay. Coarse sand up to 2mm diameter	S	D	
ZULU_SS0030_0.32	●	1	A	-				FILL: Sandy GRAVEL (GM) Coarse angular gravel up to 3cm. Fine sand	L		Brick fragment at 0.2m
						1		Hole terminated before target due to refusal No groundwater and no visible contamination			

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS031

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 29/03/2018 - 29/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Clayey SAND (SC) Light grey-brown fine sand medium plasticity clay. Roots to 25cm	L	D	
ZULU_SS0031_0.29	●	0	A	-							
								Sandy CLAY (CL) Brown high-moderate plasticity clay. Coarse sand up to 2mm diameter, well rounded.	F		
ZULU_SS0031_0.8	●	0	A	-							
						1		Clayey Sandy GRAVEL (GC) Light grey-brown/orange coarse gravel. Highly weathered rock. medium plasticity clay, fine sand	MD		Weathered basalt rock
								Hole terminated on target at 1.14m No groundwater and no visible contamination			

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS032

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 29/03/2018 - 29/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Sandy CLAY (CL) Brown moderate plasticity clay. Coarse sand up to 2mm diameter, rounded. Roots to 35cm	S-F	D	
ZULU_SS0032_0.4	●	0	A	-							
								Grey brown			
						1					
								Clayey Sandy GRAVEL (GC) Light grey-brown/orange coarse gravel. Highly weathered basalt rock, medium plasticity clay, fine sand	MD		Weathered basalt rock
								Hole terminated on target at 1.09m No groundwater and no visible contamination			

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS
● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION
D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

JACOBS

Location ID: ZULU_SS051

Sheet 1 of 1

Project: Melbourne Airport

Client: APAM

Location: Zulu
Job No: IS025200
Start - Finish Date: 28/03/2018 - 28/03/2018

Bore dia: 40mm
Driller: Apex
Rig: Push tube

Surface Conditions: Grass
Northings: [redacted]
Eastings: [redacted]

RL:
Logged: EM
Checked:

FIELD DATA							SOIL DESCRIPTION				COMMENTS
sample ID	sample type	visual ranking	odour ranking	PID (ppm)	QA/QC Sample ID	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
								Silty Sandy CLAY (CL) Brown moderate plasticity clay. Coarse sand up to 2mm diameter, rounded. Roots to 0.3m	S	D	
ZULU_SS0051_0.4	●	0	A	-					F		
						1		Hole terminated on target at 1.09m No groundwater and no visible contamination			

VISUAL RANKING

0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING

A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

PID = Photo Ionisation Detector reading (ppm, v/v)
QA/QC Sample ID = Quality Assurance /Quality Control Sample ID

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)

FIELD DATA SYMBOLS

● = Environmental Sample
X = Non Environmental Sample

MOISTURE CONDITION

D = Dry M = Moist W = Wet
Sl. M = Slightly Moist

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

ENV 1 MODIFIED ZULU AND NAR LOGS.GPJ 2/5/18

Appendix E. Laboratory certificates of analysis

Including 2014, 2015 and 2018 results.

DRAFT

JACOBS

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CHAIN OF CUSTODY & ANALYSIS REQUEST

Eurofins
3 Kingston Town Close, Oakleigh, VIC, 3166
+61 3 9564 7055

Page of

PROJECT # IS025200-550

PROJECT NAME Taxiway Zulu and Nothern Access Route

SAMPLE COLLECTOR'S NAME [redacted]

LAB JOB #

PRELIM. RESULTS BY: ☑ VERBAL ☐ FAX ☑ EMAIL

Email

FINAL REPORT BY Email

SEND TO EMAIL ADDRESS(ES): [redacted]

LAB QUOTE REF

Jacobs ORDER No:

SAMPLE ID	DEPTH (metres)	LAB #	MATRIX: WATER	MATRIX: SOIL	MATRIX: AIR	MATRIX: SLUDGE	PRESERVATION METHOD: ICE	PRESERVATION METHOD: ACID	PRESERVATION METHOD: OTHER	PRESERVATION METHOD: NONE	SAMPLING DATE	No. OF CONTAINERS	METHOD CODE & ANALYSIS REQUIRED: R1: Vic EPA IWRG621 full screen	B7: TPH, BTEXN, PAH, Metals 8	R21: NEPM screen %Fe, CEC, pH (Cacl2), TOC, % clay content	Total 28 PFAS including PFOA/PFOS and 6:2 FTS	ASLP 28 PFAS including PFOA/PFOS and 6:2 FTS	HOLD	COMMENTS (see below) (1) (2) (3)
NAR_SS038_0-2				X			X				26/3/2018	2		X		X	X		
NAR_SS048_0-4				X							27/3/2018	2		X		X	X		
NAR_SS047_0-4				X								2	X			X	X		
NAR_SS048_0-8				X								1			X				
NAR_SS046_0-6				X								3		X	X	X	X		
NAR_SS045_0-6				X								2	X			X	X		
NAR_SS044_0-4				X								2		X		X	X		
NAR_QAQC1_270318				X								1		X					
NAR_QAQC2_270318				X								1		X					Please forward to ALS
ZULU_SS024_0-5				X								3	X		X	X	X		
ZULU_SS025_0-3				X								2		X		X	X		
ZULU_SS026_0-4				X								2		X		X	X		
ZULU_SS027_0-4				X								3		X	X	X	X		
ZULU_SS028_0-4				X								2		X		X	X		
ZULU_SS029_0-4				X								2	X			X	X		
ZULU_SS024_1-15				X								2						X	HOLD
ZULU_SS025_1-15				X								2						X	HOLD
NAR_SS042_0-4				X								3	X		X	X	X		
NAR_SS043_0-4				X								2		X		X	X		
ZULU_R1_270318			X				X					5		X		X	X		
NAR SS03980				X			X					1						X	
TOTALS																			

[redacted] of Jacobs — Date 27/3 Time 14.00pm — Received by (SIGN/PRINT): of — Date Time — Custody Seals Intact?

Relinquished by (SIGN/PRINT): of — Date Time — Received by (SIGN/PRINT): of — Date Time — Sample Receipt Temp

[redacted] 27/3 6.24PM 591613

Eurofins_COC_21032018.xlsx

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CHAIN OF CUSTODY & ANALYSIS REQUEST

Eurofins
3 Kingston Town Close, Oakleigh, VIC, 3166
+61 3 9564 7055

PROJECT #: IS025200-550

PROJECT NAME: Taxiway Zulu and Nothern Access Route

SAMPLE COLLECTOR'S NAME: [redacted]

LAB JOB #:

PRELIM. RESULTS BY: ☑ Email ☐ VERBAL ☐ FAX ☑ EMAIL

FINAL REPORT BY: Email

SEND TO EMAIL ADDRESS(ES): [redacted]

LAB QUOTE REF:

Jacobs ORDER No:

SAMPLE ID	DEPTH (metres)	LAB #	MATRIX: WATER	MATRIX: SOIL	MATRIX: AIR	MATRIX: SLUDGE	PRESERVATION METHOD: ICE	PRESERVATION METHOD: ACID	PRESERVATION METHOD: OTHER	PRESERVATION METHOD: NONE	SAMPLING DATE	No. OF CONTAINERS	METHOD CODE & ANALYSIS REQUIRED: R1: Vic EPA IWRG621 full screen	B7: TPH, BTEXN, PAH, Metals 8	R21: NEPM screen %Fe, CEC, pH (CaCl2), TOC, % clay content	Total 28 PFAS including PFOA/PFOS and 6:2 FTS	ASLP 28 PFAS including PFOA/PFOS and 6:2 FTS	HOLD	COMMENTS
NAR_SS038_0.2				X			X				26/3/2018	2		X		X	X		
NAR_SS040_0.4				X							27/3/2018	2		X		X	X		
NAR_SS047_0.4				X								2	X			X	X		
NAR_SS048_0.8				X								1			X				
NAR_SS046_0.6				X								3		X	X	X	X		
NAR_SS045_0.6				X								2	X			X	X		
NAR_SS044_0.4				X								2		X		X	X		
NAR_QAQC1_270318				X								1		X					
NAR_QAQC2_270318				X								1		X					Please forward to ALS
ZULU_SS024_0.5				X								3	X		X	X	X		
ZULU_SS025_0.3				X								2		X		X	X		
ZULU_SS026_0.4				X								2		X		X	X		
ZULU_SS027_0.4				X								3		X	X	X	X		
ZULU_SS028_0.4				X								2		X		X	X		
ZULU_SS029_0.4				X								2	X			X	X		
ZULU_SS024_1.15				X								2						X	HOLD
ZULU_SS025_1.15				X								2						X	HOLD
NAR_SS042_0.4				X								3	X		X	X	X		
NAR_SS043_0.4				X								2		X		X	X		
ZULU_R1_270318			X				X					5		X		X	X		
SB3980				X			X					1						X	
TOTALS																			

[redacted] of Jacobs — Date 27/3 Time 14:00 pm — Received by (SIGN/PRINT): — of — Date — Time — Custody Seals Intact?

Relinquished by (SIGN/PRINT): — of — Date — Time — Received by (SIGN/PRINT): — of — Date — Time — Sample Receipt Temp

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluorinated Alkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Apr 06, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
Perfluoroalkane sulfonamido substances	Brisbane	Apr 06, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
Perfluoroalkane sulfonic acids (PFSAs)	Brisbane	Apr 06, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Apr 06, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
AUS Leaching Procedure	Brisbane	Apr 06, 2018	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			

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Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Project Name: TAXIWAY ZULU AND NOTHERN ACCESS ROUTE
Project ID: IS025200-550

Order No.:
Report #: 591613
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Mar 27, 2018 6:24 PM
Due: Apr 6, 2018
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X		X			X
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	NAR_SS038_0.2	Mar 26, 2018		Soil	M18-Ma33391			X		X		X
2	NAR_SS038_0.2	Mar 26, 2018		AUS Leachate	M18-Ma33392		X					X
3	NAR_SS048_0.4	Mar 27, 2018		Soil	M18-Ma33393			X		X		X
4	NAR_SS048_0.4	Mar 27, 2018		AUS Leachate	M18-Ma33394		X					X
5	NAR_SS047_0.4	Mar 27, 2018		Soil	M18-Ma33395			X			X	X
6	NAR_SS047_	Mar 27, 2018		AUS Leachate	M18-Ma33396		X					X

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Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X		X			X
Perth Laboratory - NATA Site # 23736												
	0.4											
7	NAR_SS048_ 0.8	Mar 27, 2018		Soil	M18-Ma33397			X	X			
8	NAR_SS046_ 0.6	Mar 27, 2018		Soil	M18-Ma33398			X	X	X		X
9	NAR_SS046_ 0.6	Mar 27, 2018		AUS Leachate	M18-Ma33399		X					X
10	NAR_SS045_ 0.6	Mar 27, 2018		Soil	M18-Ma33400			X			X	X
11	NAR_SS045_ 0.6	Mar 27, 2018		AUS Leachate	M18-Ma33401		X					X
12	NAR_SS044_ 0.4	Mar 27, 2018		Soil	M18-Ma33402			X		X		X
13	NAR_SS044_	Mar 27, 2018		AUS Leachate	M18-Ma33403		X					X

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Eurofins | mgt Analytical Services Manager : [redacted]

	Sample Detail					HOLD	AUS Leaching Procedure	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X		X			X
Perth Laboratory - NATA Site # 23736												
	0.4											
14	NAR_QAQC1_270318	Mar 27, 2018		Soil	M18-Ma33404			X		X		
15	ZULU_SS024_0.5	Mar 27, 2018		Soil	M18-Ma33405			X	X		X	X
16	ZULU_SS024_0.5	Mar 27, 2018		AUS Leachate	M18-Ma33406		X					X
17	ZULU_SS025_0.3	Mar 27, 2018		Soil	M18-Ma33407			X		X		X
18	ZULU_SS025_0.3	Mar 27, 2018		AUS Leachate	M18-Ma33408		X					X
19	ZULU_SS026_0.4	Mar 27, 2018		Soil	M18-Ma33409			X		X		X
20	ZULU_SS026_	Mar 27, 2018		AUS Leachate	M18-Ma33410		X					X

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Due: Apr 6, 2018
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X		X			X
Perth Laboratory - NATA Site # 23736												
	0.4											
21	ZULU_SS027_ 0.4	Mar 27, 2018		Soil	M18-Ma33411			X	X	X		X
22	ZULU_SS027_ 0.4	Mar 27, 2018		AUS Leachate	M18-Ma33412		X					X
23	ZULU_SS028_ 0.4	Mar 27, 2018		Soil	M18-Ma33413			X		X		X
24	ZULU_SS028_ 0.4	Mar 27, 2018		AUS Leachate	M18-Ma33414		X					X
25	ZULU_SS029_ 0.4	Mar 27, 2018		Soil	M18-Ma33415			X			X	X
26	ZULU_SS029_ 0.4	Mar 27, 2018		AUS Leachate	M18-Ma33416		X					X
27	NAR_SS042_	Mar 27, 2018		Soil	M18-Ma33417			X	X		X	X

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Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Project Name: TAXIWAY ZULU AND NOTHERN ACCESS ROUTE
Project ID: IS025200-550

Order No.:
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Phone: 03 8668 3000
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Received: Mar 27, 2018 6:24 PM
Due: Apr 6, 2018
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X		X			X
Perth Laboratory - NATA Site # 23736												
	0.4											
28	NAR_SS042_0.4	Mar 27, 2018		AUS Leachate	M18-Ma33418		X					X
29	NAR_SS043_0.4	Mar 27, 2018		Soil	M18-Ma33419			X		X		X
30	NAR_SS043_0.4	Mar 27, 2018		AUS Leachate	M18-Ma33420		X					X
31	ZULU_R1_270318	Mar 27, 2018		Water	M18-Ma33421					X		X
32	ZULU_SS024_1.15	Mar 27, 2018		Soil	M18-Ma33422	X						
33	ZULU_SS025_1.15	Mar 27, 2018		Soil	M18-Ma33423	X						
34	SB3980	Mar 27, 2018		Soil	M18-Ma33424	X						

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NATA # 1261 Site # 20794

Perth
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NATA # 1261
Site # 23736

Company Name:	Jacobs Group (Australia) P/L VIC	**Order No.:**		**Received:**	Mar 27, 2018 6:24 PM
Address:	PO Box 312 Flinders Lane	**Report #:**	591613	**Due:**	Apr 6, 2018
	Melbourne	**Phone:**	03 8668 3000	**Priority:**	5 Day
	VIC 8009	**Fax:**	03 8668 3001	**Contact Name:**	[redacted]
Project Name:	TAXIWAY ZULU AND NOTHERN ACCESS ROUTE				
Project ID:	IS025200-550				

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail	HOLD	AUS Leaching Procedure	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271	X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794		X		X			X
Perth Laboratory - NATA Site # 23736							
Test Counts	3	14	16	5	11	5	29

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

QC Data General Comments

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

Quality Control Results

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

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M18-Ma33392	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma33392	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma33392	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma33392	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma33392	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma33392	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma33392	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma33392	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma33392	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma33392	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma33392	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkane sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M18-Ma33392	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma33392	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma33392	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma33392	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma33392	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma33392	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma33392	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkane sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M18-Ma33392	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma33392	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma33392	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma33392	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma33392	CP	ug/L	0.05	0.04	7.0	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma33392	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma33392	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma33392	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma33392	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma33392	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M18-Ma33401	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma33401	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma33401	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma33401	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma33401	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma33401	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma33401	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma33401	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma33401	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma33401	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma33401	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkane sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M18-Ma33401	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma33401	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma33401	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma33401	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma33401	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma33401	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma33401	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkane sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M18-Ma33401	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma33401	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma33401	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma33401	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma33401	CP	ug/L	0.03	0.03	5.0	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma33401	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma33401	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma33401	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma33401	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma33401	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M18-Ma33420	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma33420	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma33420	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma33420	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma33420	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma33420	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma33420	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma33420	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma33420	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma33420	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma33420	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkane sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M18-Ma33420	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma33420	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma33420	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma33420	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma33420	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma33420	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma33420	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkane sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M18-Ma33420	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma33420	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma33420	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma33420	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma33420	CP	ug/L	0.03	0.03	5.0	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma33420	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma33420	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma33420	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma33420	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma33420	CP	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
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised By

[redacted]

Analytical Services Manager
Senior Analyst-Organic (QLD)

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 History

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

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

Description	Testing Site	Extracted	Holding Time
Vic EPA IWRG 621 (Solids)			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Mar 29, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C36			
Volatile Organics	Melbourne	Mar 29, 2018	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Mar 29, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Mar 29, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Mar 29, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Organochlorine Pesticides	Melbourne	Mar 29, 2018	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Melbourne	Mar 29, 2018	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Phenols (Halogenated)	Melbourne	Mar 29, 2018	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Melbourne	Mar 29, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Chromium (hexavalent)	Melbourne	Mar 29, 2018	28 Day
- Method: APHA 3500-Cr Hexavalent Chromium- (Extraction:- USEPA3060)			
Cyanide (total)	Melbourne	Mar 29, 2018	14 Day
- Method: LTM-INO-4020 Total Free WAD Cyanide by CFA			
Fluoride	Melbourne	Apr 03, 2018	28 Day
- Method: LTM-INO-4150 Determination of Total Fluoride PART A – CIC			
pH (1:5 Aqueous extract at 25°C as rec.)	Melbourne	Apr 06, 2018	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
IWRG 621 Metals : Metals M12	Melbourne	Mar 29, 2018	28 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
Eurofins | mgt Suite B7			
BTEX	Melbourne	Mar 29, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8	Melbourne	Mar 29, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Per- and Polyfluorinated Alkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Apr 06, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
Perfluoroalkane sulfonamido substances	Brisbane	Apr 06, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
Perfluoroalkane sulfonic acids (PFSAs)	Brisbane	Apr 06, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Apr 06, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
NEPM Screen for Soil Classification			
% Clay	Brisbane	Apr 06, 2018	6 Day
- Method: LTM-GEN-7040			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Melbourne	Mar 29, 2018	7 Day
- Method: LTM-INO-4030 Conductivity			
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Melbourne	Mar 29, 2018	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			

Description	Testing Site	Extracted	Holding Time
Total Organic Carbon	Melbourne	Apr 06, 2018	28 Day
- Method: APHA 5310B Total Organic Carbon			
Heavy Metals	Melbourne	Mar 29, 2018	180 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
Cation Exchange Capacity	Melbourne	Apr 03, 2018	180 Days
- Method: LTM-MET-3060 - Cation Exchange Capacity (CEC) & Exchangeable Sodium Percentage (ESP)			
% Moisture	Melbourne	Mar 28, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

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Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Project Name: TAXIWAY ZULU AND NOTHERN ACCESS ROUTE
Project ID: IS025200-550

Order No.:
Report #: 591613
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Mar 27, 2018 6:24 PM
Due: Apr 6, 2018
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X		X			X
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	NAR_SS038_0.2	Mar 26, 2018		Soil	M18-Ma33391			X		X		X
2	NAR_SS038_0.2	Mar 26, 2018		AUS Leachate	M18-Ma33392		X					X
3	NAR_SS048_0.4	Mar 27, 2018		Soil	M18-Ma33393			X		X		X
4	NAR_SS048_0.4	Mar 27, 2018		AUS Leachate	M18-Ma33394		X					X
5	NAR_SS047_0.4	Mar 27, 2018		Soil	M18-Ma33395			X			X	X
6	NAR_SS047_	Mar 27, 2018		AUS Leachate	M18-Ma33396		X					X

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Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X		X			X
Perth Laboratory - NATA Site # 23736												
	0.4											
7	NAR_SS048_0.8	Mar 27, 2018		Soil	M18-Ma33397			X	X			
8	NAR_SS046_0.6	Mar 27, 2018		Soil	M18-Ma33398			X	X	X		X
9	NAR_SS046_0.6	Mar 27, 2018		AUS Leachate	M18-Ma33399		X					X
10	NAR_SS045_0.6	Mar 27, 2018		Soil	M18-Ma33400			X			X	X
11	NAR_SS045_0.6	Mar 27, 2018		AUS Leachate	M18-Ma33401		X					X
12	NAR_SS044_0.4	Mar 27, 2018		Soil	M18-Ma33402			X		X		X
13	NAR_SS044_	Mar 27, 2018		AUS Leachate	M18-Ma33403		X					X

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	Sample Detail					HOLD	AUS Leaching Procedure	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X		X			X
Perth Laboratory - NATA Site # 23736												
	0.4											
14	NAR_QAQC1_270318	Mar 27, 2018		Soil	M18-Ma33404			X		X		
15	ZULU_SS024_0.5	Mar 27, 2018		Soil	M18-Ma33405			X	X		X	X
16	ZULU_SS024_0.5	Mar 27, 2018		AUS Leachate	M18-Ma33406		X					X
17	ZULU_SS025_0.3	Mar 27, 2018		Soil	M18-Ma33407			X		X		X
18	ZULU_SS025_0.3	Mar 27, 2018		AUS Leachate	M18-Ma33408		X					X
19	ZULU_SS026_0.4	Mar 27, 2018		Soil	M18-Ma33409			X		X		X
20	ZULU_SS026_	Mar 27, 2018		AUS Leachate	M18-Ma33410		X					X

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	Sample Detail					HOLD	AUS Leaching Procedure	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X		X			X
Perth Laboratory - NATA Site # 23736												
	0.4											
21	ZULU_SS027_ 0.4	Mar 27, 2018		Soil	M18-Ma33411			X	X	X		X
22	ZULU_SS027_ 0.4	Mar 27, 2018		AUS Leachate	M18-Ma33412		X					X
23	ZULU_SS028_ 0.4	Mar 27, 2018		Soil	M18-Ma33413			X		X		X
24	ZULU_SS028_ 0.4	Mar 27, 2018		AUS Leachate	M18-Ma33414		X					X
25	ZULU_SS029_ 0.4	Mar 27, 2018		Soil	M18-Ma33415			X			X	X
26	ZULU_SS029_ 0.4	Mar 27, 2018		AUS Leachate	M18-Ma33416		X					X
27	NAR_SS042_	Mar 27, 2018		Soil	M18-Ma33417			X	X		X	X

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	Sample Detail					HOLD	AUS Leaching Procedure	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X		X			X
Perth Laboratory - NATA Site # 23736												
	0.4											
28	NAR_SS042_0.4	Mar 27, 2018		AUS Leachate	M18-Ma33418		X					X
29	NAR_SS043_0.4	Mar 27, 2018		Soil	M18-Ma33419			X		X		X
30	NAR_SS043_0.4	Mar 27, 2018		AUS Leachate	M18-Ma33420		X					X
31	ZULU_R1_270318	Mar 27, 2018		Water	M18-Ma33421					X		X
32	ZULU_SS024_1.15	Mar 27, 2018		Soil	M18-Ma33422	X						
33	ZULU_SS025_1.15	Mar 27, 2018		Soil	M18-Ma33423	X						
34	SB3980	Mar 27, 2018		Soil	M18-Ma33424	X						

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	Melbourne	**Phone:**	03 8668 3000	**Priority:**	5 Day
	VIC 8009	**Fax:**	03 8668 3001	**Contact Name:**	[redacted]
Project Name:	TAXIWAY ZULU AND NOTHERN ACCESS ROUTE				
Project ID:	IS025200-550				

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail	HOLD	AUS Leaching Procedure	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271	X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794		X		X			X
Perth Laboratory - NATA Site # 23736							
Test Counts	3	14	16	5	11	5	29

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
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							
Volatile Organics							
1.1-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.2.4-Trichlorobenzene	mg/kg	< 0.5			0.5	Pass	
Hexachlorobutadiene	mg/kg	< 0.5			0.5	Pass	
1.1-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dibromoethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.4-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.3.5-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
2-Butanone (MEK)	mg/kg	< 0.5			0.5	Pass	
2-Propanone (Acetone)	mg/kg	< 0.5			0.5	Pass	
4-Chlorotoluene	mg/kg	< 0.5			0.5	Pass	
4-Methyl-2-pentanone (MIBK)	mg/kg	< 0.5			0.5	Pass	
Allyl chloride	mg/kg	< 0.5			0.5	Pass	
Benzene	mg/kg	< 0.1			0.1	Pass	
Bromobenzene	mg/kg	< 0.5			0.5	Pass	
Bromochloromethane	mg/kg	< 0.5			0.5	Pass	
Bromodichloromethane	mg/kg	< 0.5			0.5	Pass	
Bromoform	mg/kg	< 0.5			0.5	Pass	
Bromomethane	mg/kg	< 0.5			0.5	Pass	
Carbon disulfide	mg/kg	< 0.5			0.5	Pass	
Carbon Tetrachloride	mg/kg	< 0.5			0.5	Pass	
Chlorobenzene	mg/kg	< 0.5			0.5	Pass	
Chloroethane	mg/kg	< 0.5			0.5	Pass	
Chloroform	mg/kg	< 0.5			0.5	Pass	
Chloromethane	mg/kg	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
cis-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Dibromochloromethane	mg/kg	< 0.5			0.5	Pass	
Dibromomethane	mg/kg	< 0.5			0.5	Pass	
Dichlorodifluoromethane	mg/kg	< 0.5			0.5	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
Iodomethane	mg/kg	< 0.5			0.5	Pass	
Isopropyl benzene (Cumene)	mg/kg	< 0.5			0.5	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
Methylene Chloride	mg/kg	< 0.5			0.5	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Styrene	mg/kg	< 0.5			0.5	Pass	
Tetrachloroethene	mg/kg	< 0.5			0.5	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
trans-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
trans-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Trichloroethene	mg/kg	< 0.5			0.5	Pass	
Trichlorofluoromethane	mg/kg	< 0.5			0.5	Pass	
Vinyl chloride	mg/kg	< 0.5			0.5	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1.0	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1.0	Pass	
Pentachlorophenol	mg/kg	< 1			1.0	Pass	
Tetrachlorophenols - Total	mg/kg	< 1			1.0	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
2-Nitrophenol	mg/kg	< 1			1.0	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkane sulfonamido substances							
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 (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
Method Blank							
% Clay	%	< 1			1	Pass	
Chromium (hexavalent)	mg/kg	< 1			1	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	< 10			10	Pass	
Cyanide (total)	mg/kg	< 5			5	Pass	
Fluoride	mg/kg	< 100			100	Pass	
Total Organic Carbon	%	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Iron	mg/kg	< 20			20	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Molybdenum	mg/kg	< 5			5	Pass	
Nickel	mg/kg	< 5			5	Pass	
Selenium	mg/kg	< 2			2	Pass	
Silver	mg/kg	< 0.2			0.2	Pass	
Tin	mg/kg	< 10			10	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Cation Exchange Capacity							
Cation Exchange Capacity	meq/100g	< 0.05			0.05	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C6-C9	%	89			70-130	Pass	
TRH C10-C14	%	113			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	93			70-130	Pass	
Toluene	%	93			70-130	Pass	
Ethylbenzene	%	92			70-130	Pass	
m&p-Xylenes	%	97			70-130	Pass	
Xylenes - Total	%	96			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	84			70-130	Pass	
1.1.1-Trichloroethane	%	80			70-130	Pass	
1.2-Dichlorobenzene	%	105			70-130	Pass	
1.2-Dichloroethane	%	87			70-130	Pass	
Benzene	%	93			70-130	Pass	
Ethylbenzene	%	92			70-130	Pass	
m&p-Xylenes	%	97			70-130	Pass	
Toluene	%	93			70-130	Pass	
Trichloroethene	%	87			70-130	Pass	
Xylenes - Total	%	96			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	93			70-130	Pass	
TRH C6-C10	%	80			70-130	Pass	
TRH >C10-C16	%	109			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	83			70-130	Pass	
Acenaphthylene	%	88			70-130	Pass	
Anthracene	%	80			70-130	Pass	
Benz(a)anthracene	%	90			70-130	Pass	
Benzo(a)pyrene	%	80			70-130	Pass	
Benzo(b&j)fluoranthene	%	83			70-130	Pass	
Benzo(g.h.i)perylene	%	76			70-130	Pass	
Benzo(k)fluoranthene	%	77			70-130	Pass	
Chrysene	%	93			70-130	Pass	
Dibenz(a.h)anthracene	%	80			70-130	Pass	
Fluoranthene	%	90			70-130	Pass	
Fluorene	%	85			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	83			70-130	Pass	
Naphthalene	%	76			70-130	Pass	
Phenanthrene	%	79			70-130	Pass	
Pyrene	%	89			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	96			70-130	Pass	
4.4'-DDE	%	100			70-130	Pass	
4.4'-DDT	%	116			70-130	Pass	
a-BHC	%	102			70-130	Pass	
Aldrin	%	112			70-130	Pass	
b-BHC	%	92			70-130	Pass	
d-BHC	%	96			70-130	Pass	
Dieldrin	%	106			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan I	%	109			70-130	Pass	
Endosulfan II	%	104			70-130	Pass	
Endosulfan sulphate	%	107			70-130	Pass	
Endrin	%	123			70-130	Pass	
Endrin aldehyde	%	96			70-130	Pass	
Endrin ketone	%	102			70-130	Pass	
g-BHC (Lindane)	%	102			70-130	Pass	
Heptachlor	%	110			70-130	Pass	
Heptachlor epoxide	%	107			70-130	Pass	
Hexachlorobenzene	%	94			70-130	Pass	
Methoxychlor	%	122			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	97			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	68			30-130	Pass	
2.4-Dichlorophenol	%	85			30-130	Pass	
2.4.5-Trichlorophenol	%	81			30-130	Pass	
2.4.6-Trichlorophenol	%	78			30-130	Pass	
2.6-Dichlorophenol	%	81			30-130	Pass	
4-Chloro-3-methylphenol	%	81			30-130	Pass	
Pentachlorophenol	%	37			30-130	Pass	
Tetrachlorophenols - Total	%	62			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	66			30-130	Pass	
2-Methyl-4.6-dinitrophenol	%	33			30-130	Pass	
2-Methylphenol (o-Cresol)	%	71			30-130	Pass	
2-Nitrophenol	%	75			30-130	Pass	
2.4-Dimethylphenol	%	71			30-130	Pass	
2.4-Dinitrophenol	%	37			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	71			30-130	Pass	
4-Nitrophenol	%	60			30-130	Pass	
Dinoseb	%	31			30-130	Pass	
Phenol	%	67			30-130	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	98			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	92			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	99			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	99			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	100			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	88			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	101			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	103			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	100			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	95			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	95			50-150	Pass	
LCS - % Recovery							
Perfluoroalkane sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	97			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	100			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	107			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	100			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	132			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	100			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	134			50-150	Pass	
LCS - % Recovery							
Perfluoroalkane sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	102			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	97			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	101			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	100			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	101			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	111			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	106			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	107			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	109			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	126			50-150	Pass	
LCS - % Recovery							
% Clay	%	93			70-130	Pass	
Chromium (hexavalent)	%	98			70-130	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	%	95			70-130	Pass	
Cyanide (total)	%	93			70-130	Pass	
Fluoride	%	108			70-130	Pass	
Total Organic Carbon	%	112			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	106			80-120	Pass	
Cadmium	%	99			80-120	Pass	
Chromium	%	114			80-120	Pass	
Copper	%	110			80-120	Pass	
Lead	%	112			80-120	Pass	
Mercury	%	88			75-125	Pass	
Molybdenum	%	110			80-120	Pass	
Nickel	%	114			80-120	Pass	
Selenium	%	102			80-120	Pass	
Silver	%	103			80-120	Pass	
Tin	%	111			80-120	Pass	
Zinc	%	108			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M18-Ma33600	NCP	%	83			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-Ma33779	NCP	%	73			70-130	Pass	
Toluene	M18-Ma33779	NCP	%	71			70-130	Pass	
Ethylbenzene	M18-Ma33779	NCP	%	75			70-130	Pass	
m&p-Xylenes	M18-Ma33779	NCP	%	81			70-130	Pass	
o-Xylene	M18-Ma33779	NCP	%	77			70-130	Pass	
Xylenes - Total	M18-Ma33779	NCP	%	79			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Naphthalene	M18-Ma33600	NCP	%	84			70-130	Pass	
TRH C6-C10	M18-Ma33600	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M18-Ma33393	CP	%	99			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma33393	CP	%	105			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma33393	CP	%	102			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma33393	CP	%	98			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma33393	CP	%	98			50-150	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma33393	CP	%	89			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma33393	CP	%	99			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma33393	CP	%	98			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma33393	CP	%	97			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma33393	CP	%	96			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma33393	CP	%	100			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M18-Ma33393	CP	%	86			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma33393	CP	%	98			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma33393	CP	%	103			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma33393	CP	%	92			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma33393	CP	%	136			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma33393	CP	%	93			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma33393	CP	%	128			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M18-Ma33393	CP	%	104			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma33393	CP	%	97			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma33393	CP	%	101			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma33393	CP	%	92			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma33393	CP	%	102			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma33393	CP	%	91			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma33393	CP	%	103			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma33393	CP	%	103			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma33393	CP	%	111			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma33393	CP	%	112			50-150	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
1.1-Dichloroethene	M18-Ma34234	NCP	%	70			70-130	Pass	
1.1.1-Trichloroethane	M18-Ma32557	NCP	%	71			70-130	Pass	
1.2-Dichlorobenzene	M18-Ma34234	NCP	%	104			70-130	Pass	
1.2-Dichloroethane	M18-Ma34234	NCP	%	74			70-130	Pass	
Trichloroethene	M18-Ma34234	NCP	%	72			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-Ma33395	CP	%	100			70-130	Pass	
Acenaphthylene	M18-Ma33395	CP	%	107			70-130	Pass	
Anthracene	M18-Ma33395	CP	%	118			70-130	Pass	
Benz(a)anthracene	M18-Ma33395	CP	%	102			70-130	Pass	
Benzo(a)pyrene	M18-Ma33395	CP	%	103			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Ma33395	CP	%	112			70-130	Pass	
Benzo(g.h.i)perylene	M18-Ma33395	CP	%	101			70-130	Pass	
Benzo(k)fluoranthene	M18-Ma33395	CP	%	115			70-130	Pass	
Chrysene	M18-Ma33395	CP	%	106			70-130	Pass	
Dibenz(a.h)anthracene	M18-Ma33395	CP	%	113			70-130	Pass	
Fluoranthene	M18-Ma33395	CP	%	99			70-130	Pass	
Fluorene	M18-Ma33395	CP	%	110			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ma33395	CP	%	110			70-130	Pass	
Naphthalene	M18-Ma33395	CP	%	86			70-130	Pass	
Phenanthrene	M18-Ma33395	CP	%	111			70-130	Pass	
Pyrene	M18-Ma33395	CP	%	100			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	M18-Ap01081	NCP	%	106			70-130	Pass	
4.4'-DDE	M18-Ap01081	NCP	%	89			70-130	Pass	
4.4'-DDT	M18-Ap01081	NCP	%	94			70-130	Pass	
a-BHC	M18-Ap01081	NCP	%	74			70-130	Pass	
Aldrin	M18-Ap01081	NCP	%	77			70-130	Pass	
b-BHC	M18-Ap01081	NCP	%	80			70-130	Pass	
d-BHC	M18-Ap01081	NCP	%	83			70-130	Pass	
Dieldrin	M18-Ap01081	NCP	%	76			70-130	Pass	
Endosulfan I	M18-Ap01081	NCP	%	79			70-130	Pass	
Endosulfan II	M18-Ap01081	NCP	%	82			70-130	Pass	
Endosulfan sulphate	M18-Ap01081	NCP	%	88			70-130	Pass	
Endrin	M18-Ap01081	NCP	%	100			70-130	Pass	
Endrin aldehyde	M18-Ap01081	NCP	%	85			70-130	Pass	
Endrin ketone	M18-Ap01081	NCP	%	87			70-130	Pass	
g-BHC (Lindane)	M18-Ap01081	NCP	%	77			70-130	Pass	
Heptachlor	M18-Ap01081	NCP	%	84			70-130	Pass	
Heptachlor epoxide	M18-Ap01081	NCP	%	79			70-130	Pass	
Hexachlorobenzene	M18-Ap01081	NCP	%	76			70-130	Pass	
Methoxychlor	M18-Ap01081	NCP	%	115			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	M18-Ma34317	NCP	%	101			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	M18-Ma33395	CP	%	103			30-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.4-Dichlorophenol	M18-Ma33395	CP	%	73			30-130	Pass	
2.4.5-Trichlorophenol	M18-Ma33395	CP	%	99			30-130	Pass	
2.4.6-Trichlorophenol	M18-Ma33395	CP	%	61			30-130	Pass	
2.6-Dichlorophenol	M18-Ma33395	CP	%	96			30-130	Pass	
4-Chloro-3-methylphenol	M18-Ma33395	CP	%	97			30-130	Pass	
Pentachlorophenol	M18-Ma33395	CP	%	98			30-130	Pass	
Tetrachlorophenols - Total	M18-Ma33395	CP	%	78			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	M18-Ma33395	CP	%	50			30-130	Pass	
2-Methyl-4.6-dinitrophenol	M18-Ma33395	CP	%	41			30-130	Pass	
2-Methylphenol (o-Cresol)	M18-Ma33395	CP	%	82			30-130	Pass	
2-Nitrophenol	M18-Ma33395	CP	%	77			30-130	Pass	
2.4-Dimethylphenol	M18-Ma33395	CP	%	82			30-130	Pass	
2.4-Dinitrophenol	M18-Ma33395	CP	%	110			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M18-Ma33395	CP	%	87			30-130	Pass	
4-Nitrophenol	M18-Ma33395	CP	%	108			30-130	Pass	
Dinoseb	M18-Ma33395	CP	%	76			30-130	Pass	
Phenol	M18-Ma33395	CP	%	81			30-130	Pass	
Spike - % Recovery									
				Result 1					
Chromium (hexavalent)	M18-Ma32531	NCP	%	101			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Selenium	M18-Ma32572	NCP	%	86			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Ma33404	CP	%	85			75-125	Pass	
Cadmium	M18-Ma33404	CP	%	84			75-125	Pass	
Chromium	M18-Ma33404	CP	%	97			75-125	Pass	
Copper	M18-Ma33404	CP	%	100			75-125	Pass	
Lead	M18-Ma33404	CP	%	89			75-125	Pass	
Mercury	M18-Ma33404	CP	%	84			70-130	Pass	
Molybdenum	M18-Ma33404	CP	%	93			75-125	Pass	
Nickel	M18-Ma33404	CP	%	93			75-125	Pass	
Silver	M18-Ma33404	CP	%	89			75-125	Pass	
Tin	M18-Ma33404	CP	%	91			75-125	Pass	
Zinc	M18-Ma33404	CP	%	90			75-125	Pass	
Spike - % Recovery									
				Result 1					
Fluoride	M18-Ma33405	CP	%	118			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M18-Ma33407	CP	%	117			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M18-Ma33407	CP	%	105			70-130	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M18-Ma33413	CP	%	97			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma33413	CP	%	83			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma33413	CP	%	101			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma33413	CP	%	101			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma33413	CP	%	98			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorononanoic acid (PFNA)	M18-Ma33413	CP	%	85			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma33413	CP	%	98			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma33413	CP	%	98			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma33413	CP	%	94			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma33413	CP	%	102			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma33413	CP	%	93			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M18-Ma33413	CP	%	93			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma33413	CP	%	97			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma33413	CP	%	97			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma33413	CP	%	93			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma33413	CP	%	128			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma33413	CP	%	92			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma33413	CP	%	130			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M18-Ma33413	CP	%	100			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma33413	CP	%	95			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma33413	CP	%	103			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma33413	CP	%	92			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma33413	CP	%	92			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma33413	CP	%	98			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma33413	CP	%	101			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma33413	CP	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma33413	CP	%	113			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma33413	CP	%	105			50-150	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-Ma33415	CP	%	101			70-130	Pass	
Acenaphthylene	M18-Ma33415	CP	%	109			70-130	Pass	
Anthracene	M18-Ma33415	CP	%	109			70-130	Pass	
Benz(a)anthracene	M18-Ma33415	CP	%	104			70-130	Pass	
Benzo(a)pyrene	M18-Ma33415	CP	%	95			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Ma33415	CP	%	99			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(g.h.i)perylene	M18-Ma33415	CP	%	96			70-130	Pass	
Benzo(k)fluoranthene	M18-Ma33415	CP	%	111			70-130	Pass	
Chrysene	M18-Ma33415	CP	%	98			70-130	Pass	
Dibenz(a.h)anthracene	M18-Ma33415	CP	%	76			70-130	Pass	
Fluoranthene	M18-Ma33415	CP	%	95			70-130	Pass	
Fluorene	M18-Ma33415	CP	%	111			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ma33415	CP	%	76			70-130	Pass	
Naphthalene	M18-Ma33415	CP	%	89			70-130	Pass	
Phenanthrene	M18-Ma33415	CP	%	114			70-130	Pass	
Pyrene	M18-Ma33415	CP	%	94			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	M18-Ma33415	CP	%	84			30-130	Pass	
2.4-Dichlorophenol	M18-Ma33415	CP	%	73			30-130	Pass	
2.4.5-Trichlorophenol	M18-Ma33415	CP	%	94			30-130	Pass	
2.4.6-Trichlorophenol	M18-Ma33415	CP	%	56			30-130	Pass	
2.6-Dichlorophenol	M18-Ma33415	CP	%	93			30-130	Pass	
4-Chloro-3-methylphenol	M18-Ma33415	CP	%	91			30-130	Pass	
Pentachlorophenol	M18-Ma33415	CP	%	111			30-130	Pass	
Tetrachlorophenols - Total	M18-Ma33415	CP	%	72			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	M18-Ma33415	CP	%	38			30-130	Pass	
2-Methyl-4.6-dinitrophenol	M18-Ma33415	CP	%	35			30-130	Pass	
2-Methylphenol (o-Cresol)	M18-Ma33415	CP	%	77			30-130	Pass	
2-Nitrophenol	M18-Ma33415	CP	%	75			30-130	Pass	
2.4-Dimethylphenol	M18-Ma33415	CP	%	83			30-130	Pass	
2.4-Dinitrophenol	M18-Ma33415	CP	%	47			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M18-Ma33415	CP	%	86			30-130	Pass	
4-Nitrophenol	M18-Ma33415	CP	%	119			30-130	Pass	
Dinoseb	M18-Ma33415	CP	%	83			30-130	Pass	
Phenol	M18-Ma33415	CP	%	77			30-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M18-Ma33391	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M18-Ma31576	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M18-Ma31576	NCP	mg/kg	55	61	9.0	30%	Pass	
TRH C29-C36	M18-Ma31576	NCP	mg/kg	87	98	12	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-Ma33391	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M18-Ma33391	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M18-Ma33391	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M18-Ma33391	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M18-Ma33391	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M18-Ma33391	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-Ma33391	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M18-Ma33391	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M18-Ma31576	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M18-Ma31576	NCP	mg/kg	100	120	11	30%	Pass	
TRH >C34-C40	M18-Ma31576	NCP	mg/kg	< 100	< 100	<1	30%	Pass	

Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkane sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma33391	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma33391	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkane sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma33391	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma33391	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-Ma33393	CP	%	17	15	9.0	30%	Pass	

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4-Trichlorobenzene	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Hexachlorobutadiene	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1-Dichloroethene	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1-Trichloroethane	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2-Trichloroethane	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dibromoethane	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichlorobenzene	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloroethane	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloropropane	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.3-Trichloropropane	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4-Trimethylbenzene	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichlorobenzene	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichloropropane	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3.5-Trimethylbenzene	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.4-Dichlorobenzene	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Butanone (MEK)	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Propanone (Acetone)	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chlorotoluene	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Allyl chloride	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromobenzene	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromochloromethane	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromodichloromethane	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromoform	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromomethane	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon disulfide	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon Tetrachloride	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chlorobenzene	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroethane	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroform	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloromethane	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.2-Dichloroethene	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.3-Dichloropropene	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromochloromethane	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromomethane	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorodifluoromethane	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Iodomethane	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Isopropyl benzene (Cumene)	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Methylene Chloride	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Styrene	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Tetrachloroethene	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.2-Dichloroethene	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.3-Dichloropropene	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichloroethene	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichlorofluoromethane	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Vinyl chloride	M18-Ma34240	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M18-Ap01080	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M18-Ap01080	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M18-Ap01080	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M18-Ap01080	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M18-Ap01080	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M18-Ap01080	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M18-Ap01080	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M18-Ap01080	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M18-Ap01080	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M18-Ap01080	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M18-Ap01080	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M18-Ap01080	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M18-Ap01080	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M18-Ap01080	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M18-Ap01080	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M18-Ap01080	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M18-Ap01080	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M18-Ap01080	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M18-Ap01080	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M18-Ap01080	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M18-Ap01080	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M18-Ap01080	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	M18-Ap01080	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	M18-Ap01080	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	M18-Ap01080	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	M18-Ap01080	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	M18-Ap01080	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	M18-Ap01080	NCP	mg/kg	0.4	0.3	31	30%	Fail	Q15
Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	M18-Ma32466	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Cyanide (total)	M18-Ma32466	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Fluoride	M18-Ma34217	NCP	mg/kg	280	270	4.0	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	B18-Fe26640	NCP	pH Units	8.9	8.8	pass	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Selenium	M18-Ma32572	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	M18-Fe29170	NCP	uS/cm	110	100	5.4	30%	Pass	
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	M18-Ma35865	NCP	pH Units	5.7	5.9	pass	30%	Pass	
Total Organic Carbon	S18-Ma33267	NCP	%	1.2	1.1	7.5	30%	Pass	
Duplicate									
Cation Exchange Capacity				Result 1	Result 2	RPD			
Cation Exchange Capacity	B18-Ma31241	NCP	meq/100g	17	17	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Clay	M18-Ma33398	CP	%	24	24	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Ma33402	CP	mg/kg	2.5	< 2	19	30%	Pass	
Cadmium	M18-Ma33402	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Ma33402	CP	mg/kg	30	29	6.0	30%	Pass	
Copper	M18-Ma33402	CP	mg/kg	11	9.4	11	30%	Pass	
Lead	M18-Ma33402	CP	mg/kg	13	13	3.0	30%	Pass	
Mercury	M18-Ma33402	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M18-Ma33402	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M18-Ma33402	CP	mg/kg	22	23	5.0	30%	Pass	
Silver	M18-Ma33402	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M18-Ma33402	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M18-Ma33402	CP	mg/kg	12	12	5.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Ma33404	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	M18-Ma33404	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Ma33404	CP	mg/kg	36	36	1.0	30%	Pass	
Copper	M18-Ma33404	CP	mg/kg	9.8	9.8	<1	30%	Pass	
Lead	M18-Ma33404	CP	mg/kg	14	14	2.0	30%	Pass	
Mercury	M18-Ma33404	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M18-Ma33404	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M18-Ma33404	CP	mg/kg	21	21	1.0	30%	Pass	
Silver	M18-Ma33404	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M18-Ma33404	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M18-Ma33404	CP	mg/kg	10	10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkane sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma33411	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma33411	CP	ug/kg	< 10	< 10	<1	30%	Pass	

Duplicate									
Perfluoroalkane sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma33411	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma33411	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-Ma33411	CP	%	9.0	9.5	5.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Iron	M18-Ma32935	NCP	mg/kg	19000	19000	1.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Iron (%)	M18-Ma33866	NCP	%	2.2	2.2	1.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	M18-Ma33413	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	M18-Ma33413	CP	mg/kg	< 1	< 1	<1	30%	Pass	

Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2.6-Dichlorophenol	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	M18-Ma33413	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	M18-Ma33413	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	M18-Ma33413	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M18-Ma33413	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M18-Ma33413	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M18-Ma33413	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	M18-Ma33413	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	M18-Ma33413	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M18-Ma33413	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	M18-Ma33413	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	M18-Ma33413	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	M18-Ma33413	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

[redacted]

Analytical Services Manager
Senior Analyst-Metal (VIC)
Senior Analyst-Volatile (VIC)
Senior Analyst-Inorganic (QLD)
Senior Analyst-Organic (QLD)
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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Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Vic EPA IWRG 621 (Solids)			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Apr 04, 2018	7 Day
- Method: LTM-ORG-2010 TRH C6-C36			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Mar 29, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 04, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Apr 04, 2018	7 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Eurofins | mgt Suite B7			
BTEX	Melbourne	Mar 29, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8	Melbourne	Mar 29, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Per- and Polyfluorinated Alkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Mar 28, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
Perfluoroalkane sulfonamido substances	Brisbane	Mar 28, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
Perfluoroalkane sulfonic acids (PFSAs)	Brisbane	Mar 28, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Mar 28, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			

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Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Project Name: TAXIWAY ZULU AND NOTHERN ACCESS ROUTE
Project ID: IS025200-550

Order No.:
Report #: 591613
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Mar 27, 2018 6:24 PM
Due: Apr 6, 2018
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X		X			X
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	NAR_SS038_0.2	Mar 26, 2018		Soil	M18-Ma33391			X		X		X
2	NAR_SS038_0.2	Mar 26, 2018		AUS Leachate	M18-Ma33392		X					X
3	NAR_SS048_0.4	Mar 27, 2018		Soil	M18-Ma33393			X		X		X
4	NAR_SS048_0.4	Mar 27, 2018		AUS Leachate	M18-Ma33394		X					X
5	NAR_SS047_0.4	Mar 27, 2018		Soil	M18-Ma33395			X			X	X
6	NAR_SS047_	Mar 27, 2018		AUS Leachate	M18-Ma33396		X					X

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Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X		X			X
Perth Laboratory - NATA Site # 23736												
	0.4											
7	NAR_SS048_0.8	Mar 27, 2018		Soil	M18-Ma33397			X	X			
8	NAR_SS046_0.6	Mar 27, 2018		Soil	M18-Ma33398			X	X	X		X
9	NAR_SS046_0.6	Mar 27, 2018		AUS Leachate	M18-Ma33399		X					X
10	NAR_SS045_0.6	Mar 27, 2018		Soil	M18-Ma33400			X			X	X
11	NAR_SS045_0.6	Mar 27, 2018		AUS Leachate	M18-Ma33401		X					X
12	NAR_SS044_0.4	Mar 27, 2018		Soil	M18-Ma33402			X		X		X
13	NAR_SS044_	Mar 27, 2018		AUS Leachate	M18-Ma33403		X					X

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Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X		X			X
Perth Laboratory - NATA Site # 23736												
	0.4											
14	NAR_QAQC1_270318	Mar 27, 2018		Soil	M18-Ma33404			X		X		
15	ZULU_SS024_0.5	Mar 27, 2018		Soil	M18-Ma33405			X	X		X	X
16	ZULU_SS024_0.5	Mar 27, 2018		AUS Leachate	M18-Ma33406		X					X
17	ZULU_SS025_0.3	Mar 27, 2018		Soil	M18-Ma33407			X		X		X
18	ZULU_SS025_0.3	Mar 27, 2018		AUS Leachate	M18-Ma33408		X					X
19	ZULU_SS026_0.4	Mar 27, 2018		Soil	M18-Ma33409			X		X		X
20	ZULU_SS026_	Mar 27, 2018		AUS Leachate	M18-Ma33410		X					X

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Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X		X			X
Perth Laboratory - NATA Site # 23736												
	0.4											
21	ZULU_SS027_ 0.4	Mar 27, 2018		Soil	M18-Ma33411			X	X	X		X
22	ZULU_SS027_ 0.4	Mar 27, 2018		AUS Leachate	M18-Ma33412		X					X
23	ZULU_SS028_ 0.4	Mar 27, 2018		Soil	M18-Ma33413			X		X		X
24	ZULU_SS028_ 0.4	Mar 27, 2018		AUS Leachate	M18-Ma33414		X					X
25	ZULU_SS029_ 0.4	Mar 27, 2018		Soil	M18-Ma33415			X			X	X
26	ZULU_SS029_ 0.4	Mar 27, 2018		AUS Leachate	M18-Ma33416		X					X
27	NAR_SS042_	Mar 27, 2018		Soil	M18-Ma33417			X	X		X	X

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Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X		X			X
Perth Laboratory - NATA Site # 23736												
	0.4											
28	NAR_SS042_0.4	Mar 27, 2018		AUS Leachate	M18-Ma33418		X					X
29	NAR_SS043_0.4	Mar 27, 2018		Soil	M18-Ma33419			X		X		X
30	NAR_SS043_0.4	Mar 27, 2018		AUS Leachate	M18-Ma33420		X					X
31	ZULU_R1_270318	Mar 27, 2018		Water	M18-Ma33421					X		X
32	ZULU_SS024_1.15	Mar 27, 2018		Soil	M18-Ma33422	X						
33	ZULU_SS025_1.15	Mar 27, 2018		Soil	M18-Ma33423	X						
34	SB3980	Mar 27, 2018		Soil	M18-Ma33424	X						

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Sample Detail	HOLD	AUS Leaching Procedure	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271	X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794		X		X			X
Perth Laboratory - NATA Site # 23736							
Test Counts	3	14	16	5	11	5	29

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
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							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkane sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkane sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	111			70-130	Pass	
TRH C10-C14	%	112			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	99			70-130	Pass	
Toluene	%	91			70-130	Pass	
Ethylbenzene	%	101			70-130	Pass	
m&p-Xylenes	%	102			70-130	Pass	
Xylenes - Total	%	101			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	114			70-130	Pass	
TRH C6-C10	%	109			70-130	Pass	
TRH >C10-C16	%	104			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	121			70-130	Pass	
Acenaphthylene	%	129			70-130	Pass	
Anthracene	%	92			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benz(a)anthracene	%	109			70-130	Pass	
Benzo(a)pyrene	%	98			70-130	Pass	
Benzo(b&j)fluoranthene	%	97			70-130	Pass	
Benzo(g.h.i)perylene	%	98			70-130	Pass	
Benzo(k)fluoranthene	%	128			70-130	Pass	
Chrysene	%	106			70-130	Pass	
Dibenz(a.h)anthracene	%	93			70-130	Pass	
Fluoranthene	%	125			70-130	Pass	
Fluorene	%	129			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	98			70-130	Pass	
Naphthalene	%	124			70-130	Pass	
Phenanthrene	%	110			70-130	Pass	
Pyrene	%	110			70-130	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	99			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	91			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	97			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	95			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	100			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	98			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	95			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	101			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	95			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	86			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	94			50-150	Pass	
LCS - % Recovery							
Perfluoroalkane sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	99			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	95			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	98			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)	%	91			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	101			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	97			50-150	Pass	
LCS - % Recovery							
Perfluoroalkane sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	102			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	98			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	101			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	93			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	96			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	78			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	102			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	105			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	99			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	80			50-150	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	101			80-120	Pass	
Cadmium	%	94			80-120	Pass	
Chromium	%	98			80-120	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Copper			%	97			80-120	Pass	
Lead			%	107			80-120	Pass	
Mercury			%	89			75-125	Pass	
Nickel			%	98			80-120	Pass	
Zinc			%	100			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M18-Ma34059	NCP	%	129			70-130	Pass	
TRH C10-C14	M18-Ma33512	NCP	%	int			70-130	Fail	Q08
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-Ma34059	NCP	%	106			70-130	Pass	
Toluene	M18-Ma34059	NCP	%	106			70-130	Pass	
Ethylbenzene	M18-Ma34059	NCP	%	106			70-130	Pass	
m&p-Xylenes	M18-Ma34059	NCP	%	106			70-130	Pass	
o-Xylene	M18-Ma34059	NCP	%	103			70-130	Pass	
Xylenes - Total	M18-Ma34059	NCP	%	105			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-Ma34059	NCP	%	94			70-130	Pass	
TRH C6-C10	M18-Ma34059	NCP	%	128			70-130	Pass	
TRH >C10-C16	M18-Ma33512	NCP	%	int			70-130	Fail	Q08
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-Ma34532	NCP	%	83			70-130	Pass	
Acenaphthylene	M18-Ma34532	NCP	%	95			70-130	Pass	
Anthracene	M18-Ma34532	NCP	%	121			70-130	Pass	
Benz(a)anthracene	M18-Ma34532	NCP	%	113			70-130	Pass	
Benzo(a)pyrene	M18-Ma34532	NCP	%	99			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Ma34532	NCP	%	126			70-130	Pass	
Benzo(g.h.i)perylene	M18-Ma34532	NCP	%	103			70-130	Pass	
Benzo(k)fluoranthene	M18-Ma34532	NCP	%	93			70-130	Pass	
Chrysene	M18-Ma34532	NCP	%	117			70-130	Pass	
Dibenz(a.h)anthracene	M18-Ma34532	NCP	%	99			70-130	Pass	
Fluoranthene	M18-Ma34532	NCP	%	127			70-130	Pass	
Fluorene	M18-Ma34532	NCP	%	93			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ma34532	NCP	%	103			70-130	Pass	
Naphthalene	M18-Ma34532	NCP	%	103			70-130	Pass	
Phenanthrene	M18-Ma34532	NCP	%	120			70-130	Pass	
Pyrene	M18-Ma34532	NCP	%	127			70-130	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	S18-Ma34603	NCP	%	91			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	S18-Ma34603	NCP	%	83			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	S18-Ma34603	NCP	%	89			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	S18-Ma34603	NCP	%	86			50-150	Pass	
Perfluorooctanoic acid (PFOA)	S18-Ma34603	NCP	%	89			50-150	Pass	
Perfluorononanoic acid (PFNA)	S18-Ma34603	NCP	%	87			50-150	Pass	
Perfluorodecanoic acid (PFDA)	S18-Ma34603	NCP	%	85			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	S18-Ma34603	NCP	%	93			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	S18-Ma34603	NCP	%	92			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorotridecanoic acid (PFTrDA)	S18-Ma34603	NCP	%	88			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S18-Ma34603	NCP	%	88			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	S18-Ma34603	NCP	%	92			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S18-Ma34603	NCP	%	90			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S18-Ma34603	NCP	%	97			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	S18-Ma34603	NCP	%	103			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	S18-Ma34603	NCP	%	85			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S18-Ma34603	NCP	%	100			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S18-Ma34603	NCP	%	97			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	S18-Ma34603	NCP	%	92			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S18-Ma34603	NCP	%	110			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S18-Ma34603	NCP	%	100			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S18-Ma34603	NCP	%	77			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	S18-Ma34603	NCP	%	86			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	S18-Ma34603	NCP	%	61			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S18-Ma34603	NCP	%	94			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	S18-Ma34603	NCP	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S18-Ma34603	NCP	%	95			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S18-Ma34603	NCP	%	88			50-150	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Ma36116	NCP	%	103			75-125	Pass	
Cadmium	M18-Ma36116	NCP	%	101			75-125	Pass	
Chromium	M18-Ma36116	NCP	%	97			75-125	Pass	
Copper	M18-Ma36116	NCP	%	100			75-125	Pass	
Lead	M18-Ma36116	NCP	%	105			75-125	Pass	
Mercury	M18-Ma36116	NCP	%	92			70-130	Pass	
Nickel	M18-Ma36116	NCP	%	101			75-125	Pass	
Zinc	M18-Ma36116	NCP	%	103			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M18-Ma34059	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M18-Ma34531	NCP	mg/L	2.0	1.5	30	30%	Pass	
TRH C15-C28	M18-Ma34531	NCP	mg/L	8.6	6.5	28	30%	Pass	
TRH C29-C36	M18-Ma34531	NCP	mg/L	0.2	0.2	18	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-Ma34059	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M18-Ma34059	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M18-Ma34059	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M18-Ma34059	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M18-Ma34059	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M18-Ma34059	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-Ma34059	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M18-Ma34059	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	M18-Ma34531	NCP	mg/L	2.7	2.0	31	30%	Fail	Q15
TRH >C16-C34	M18-Ma34531	NCP	mg/L	6.2	4.4	34	30%	Fail	Q15
TRH >C34-C40	M18-Ma34531	NCP	mg/L	0.1	< 0.1	18	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M18-Ma34531	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M18-Ma34531	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M18-Ma34531	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M18-Ma34531	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M18-Ma34531	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Ma34531	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-Ma34531	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Ma34531	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	M18-Ma34531	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	M18-Ma34531	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	M18-Ma34531	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M18-Ma34531	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ma34531	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	M18-Ma34531	NCP	mg/L	< 0.001	0.004	<1	30%	Pass	
Phenanthrene	M18-Ma34531	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	M18-Ma34531	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M18-Ma33421	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma33421	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma33421	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma33421	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma33421	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma33421	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma33421	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma33421	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma33421	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma33421	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma33421	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkane sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M18-Ma33421	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma33421	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma33421	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma33421	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma33421	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma33421	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma33421	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkane sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M18-Ma33421	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma33421	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma33421	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma33421	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma33421	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma33421	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma33421	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma33421	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma33421	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma33421	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Ma34952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	M18-Ma34952	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	M18-Ma34952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	M18-Ma34952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead	M18-Ma34952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	M18-Ma34952	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	M18-Ma34952	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	M18-Ma34952	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
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
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

[redacted]

Analytical Services Manager
Senior Analyst-Metal (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.

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PO Box 312
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Fx: +61 3 8668 3001

CHAIN OF CUSTODY & ANALYSIS REQUEST

Eurofins
3 Kingston Town Close, Oakleigh, VIC, 3166
+61 3 9564 7055

PROJECT #: IS025200-550
PROJECT NAME: Taxiway Zulu and Nothern Access Route
SAMPLE COLLECTOR'S NAME: [redacted]
LAB JOB #:

PRELIM. RESULTS BY: ☑ VERBAL; Email ☐ FAX; ☑ EMAIL
FINAL REPORT BY: Email
SEND TO EMAIL ADDRESS(ES): [redacted]
LAB QUOTE REF:
Jacobs ORDER No:

SAMPLE ID	DEPTH (metres)	LAB #	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATION METHOD: ICE	ACID	OTHER	NONE	SAMPLING DATE	No. OF CONTAINERS	METHOD CODE & ANALYSIS REQUIRED: R1: Vic EPA IWRG621 full screen	B7: TPH, BTEXN, PAH, Metals 8	R21: NEPM screen %Fe, CEC, pH (CaCl2), TOC, % clay content	Total 28 PFAS including PFOA/PFOS and 6:2 FTS	ASLP 28 PFAS including PFOA/PFOS and 6:2 FTS	HOLD	COMMENTS (see below) (1) (2) (3)
NAR_SS049_0·4				X			X				28/3/18	2		X		X	X		
NAR_SS050_0·4				X			X					2	X			X	X		
NAR_SS041_0·4				X			X					2		X		X	X		
NAR_SS040_0·6				X			X					2		X		X	X		
NAR_SS039_0·4				X			X					2		X		X	X		
NAR_SS036A_0·3				X			X					2	X			X	X		
NAR_SS035_0·55				X			X					3		X	X	X	X		
ZULU_SS003_0·4				X			X					2		X		X	X		
ZULU_SS004_0·24				X			X					2		X		X	X		
NAR_QAQC1_280318				X			X					1				X	X		
NAR_QAQC2_280318				X			X									X	X		→ Please forward to ALS
ZULU_R1_280318			X				X					5		X		X	X		
Trip blank 563982				X			X											X	
ZULU_SS002_0·4				X			X					2		X		X	X		
ZULU_SS001_0·4				X			X					2	X			X	X		
ZULU_SS051_0·4				X			X					2		X		X	X		
ZULU_SS005_0·11				X			X									X	X		→ low sample volume
ZULU_SS006_0·45				X			X					2		X		X	X		
ZULU_SS007_0·4				X			X					2		X		X	X		
ZULU_SS008_0·4				X			X					2		X		X	X		
ZULU_SS009_0·3				X			X					2	X			X	X		
TOTALS												42							

Relinquished by (SIGN/PRINT): [redacted] of Jacobs — Date: 28/3 — Time: 4:09pm
Received by (SIGN/PRINT): [redacted] 591863 of EFMelb — Date: 28/3/18 — Time: 18:34
Custody Seals Intact?
Relinquished by (SIGN/PRINT): — of — Date — Time
Received by (SIGN/PRINT): — of — Date — Time
Sample Receipt Temp

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CHAIN OF CUSTODY & ANALYSIS REQUEST

Eurofins
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+61 3 9564 7055

PROJECT #	PROJECT NAME
IS025200-550	Taxiway Zulu and Nothern Access Route

SAMPLE COLLECTOR'S NAME: [redacted]

LAB JOB #:

PRELIM. RESULTS BY: ☑ VERBAL ☐ FAX ☑ EMAIL
Email

FINAL REPORT BY: Email
SEND TO EMAIL ADDRESS(ES): [redacted]

LAB QUOTE REF:
Jacobs ORDER No:

SAMPLE ID	DEPTH (metres)	LAB #	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATION METHOD: ICE	ACID	OTHER	NONE	SAMPLING DATE	No. OF CONTAINERS	METHOD CODE & ANALYSIS REQUIRED: R1: Vic EPA IWRG621 full screen	B7: TPH, BTEXN, PAH, Metals 8	R21: NEPM screen %Fe, CEC, pH (CaCl2), TOC, % clay content	Total 28 PFAS including PFOA/PFOS and 6:2 FTS	ASLP 28 PFAS including PFOA/PFOS and 6:2 FTS	HOLD	COMMENTS (see below) (1) (2) (3)
ZULU_SS007_	1.1			X			X				28/3/18	3						X	
ZULU_SS008_	1.2			X			X				↓	3						X	
ZULU_SS009_	0.92			X			X					2							
TOTALS												6							

Relinquished by (SIGN/PRINT)	Date	Time	Received by (SIGN/PRINT)	Date	Time	Custody Seals Intact?
[redacted] of Jacobs	28/3	4.00pm	[redacted] 591863 of EE/MGT	28/3/18	18:34	
of	Date	Time	of	Date	Time	Sample Receipt Temp

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PROJECT #: IS025200-550
PROJECT NAME: Taxiway Zulu and Nothern Access Route
SAMPLE COLLECTOR'S NAME: [redacted]
LAB JOB #:

PRELIM. RESULTS BY: ☑ VERBAL ☐ FAX ☑ EMAIL
Email
FINAL REPORT BY: Email
SEND TO EMAIL ADDRESS(ES): [redacted]
LAB QUOTE REF:
Jacobs ORDER No:

SAMPLE ID	DEPTH (metres)	LAB #	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATION METHOD: ICE	ACID	OTHER	NONE	SAMPLING DATE	No. OF CONTAINERS	METHOD CODE & ANALYSIS REQUIRED: R1: Vic EPA IWRG621 full screen	B7: TPH, BTEXN, PAH, Metals 8	R21: NEPM screen %Fe, CEC, pH (CaCl2), TOC, % clay content	Total 28 PFAS including PFOA/PFOS and 6:2 FTS	ASLP 28 PFAS including PFOA/PFOS and 6:2 FTS	HOLD	COMMENTS (see below) (1) (2) (3)
JAR_SS049_0·4				X			X				28/3/18	2		X		X	X		
JAR_SS050_0·4				X			X					2	X			X	X		
JAR_SS041_0·4				X			X					2		X		X	X		
JAR_SS040_0·6				X			X					2		X		X	X		
JAR_SS039_0·4				X			X					2		X		X	X		
JAR_SS036A_0·3				X			X					2	X			X	X		
JAR_SS035_0·55				X			X					3		X	X	X	X		
JLU_SS003_0·4				X			X					2		X		X	X		
JLU_SS004_0·24				X			X					2		X		X	X		
JAR_QAQC1_280318				X			X					1				X	X		
JAR_QAQC2_280318				X			X					1				X	X		→ Please forward to ALS
JLU_R1_280318			X				X					5		X		X	X		
Trip blank 563982				X			X					1						X	
JLU_SS002_0·4				X			X					2		X		X	X		
JLU_SS001_0·4				X			X					2	X			X	X		
JLU_SS051_0·4				X			X					2		X		X	X		
JLU_SS005_0·11				X			X					2				X	X		low sample volume
JLU_SS006_0·45				X			X					2		X		X	X		
JLU_SS007_0·4				X			X					2		X		X	X		
JLU_SS008_0·4				X			X					2		X		X	X		
JLU_SS009_0·3				X			X					2	X			X	X		
TOTALS												42							

Relinquished by (SIGN/PRINT): [redacted] of Jacobs
Date: 28/3 Time: 14:00
Received by (SIGN/PRINT): [redacted] 591863 of EF/MGT
Date: 28/3/18 Time: 18:34
Custody Seals Intact?

Relinquished by (SIGN/PRINT): of
Date: Time:
Received by (SIGN/PRINT): of
Date: Time:
Sample Receipt Temp.

COPY

Enviro Sample Vic

From: [redacted]
Sent: Wednesday, 4 April 2018 3:32 PM
To: Enviro Sample Vic; [redacted]
Cc: [redacted]
Subject: RE: [EXTERNAL] Eurofins | mgt Sample Receipt Advice - Report 591863 : Site TAXIWAY ZULU AND NORTHERN ACCESS ROUTE (IS025200-550)
Attachments: 591863_summary.pdf; 591863_sample_receipt_coc.pdf; 591863_COC.pdf

Afternoon [redacted]

For the attached sample summary, can the sample name for **TRIP BLANK 563982** please be changed to **SB3982** for reporting? Also, when you have a chance can you please send through an estimate of when results will be available for this job (591863), 591613 and 591525?

Kind regards,

[redacted]
Contaminated Land Consultant
[redacted]

Level 11, 452 Flinders Street
Melbourne, VIC 3000
Australia
www.jacobs.com

From: EnviroSampleVic@eurofins.com [mailto:EnviroSampleVic@eurofins.com]
Sent: Tuesday, 3 April 2018 4:03 PM
To: [redacted]
Subject: [EXTERNAL] Eurofins | mgt Sample Receipt Advice - Report 591863 : Site TAXIWAY ZULU AND NORTHERN ACCESS ROUTE (IS025200-550)

Dear Valued Client,

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

Regards

[redacted]

Eurofins | mgt
2-5 Kingston Town Close
OAKLEIGH VIC 3166
AUSTRALIA
Phone:

Email: Envirosamplevic@eurofins.com
Website:environment.eurofins.com.au

EnviroNote 1076 - PFAS Biota
EnviroNote 1074 - Passive Samplers for VOCs in Air

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Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluorinated Alkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Apr 06, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
Perfluoroalkane sulfonamido substances	Brisbane	Apr 06, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
Perfluoroalkane sulfonic acids (PFSAs)	Brisbane	Apr 06, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Apr 06, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
AUS Leaching Procedure	Brisbane	Apr 06, 2018	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			

eurofins | mgt

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web : www.eurofins.com.au

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Site # 1254 & 14271

Sydney
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Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

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

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

Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Order No.:
Report #: 591863
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Mar 28, 2018 6:34 PM
Due: Apr 9, 2018
Priority: 5 Day
Contact Name: [redacted]

Project Name: TAXIWAY ZULU AND NORTHERN ACCESS ROUTE
Project ID: IS025200-550

Eurofins | mgt Analytical Services Manager [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217													
Brisbane Laboratory - NATA Site # 20794							X	X	X	X			X
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	NAR_SS049_0.4	Mar 28, 2018		Soil	M18-Ma35340			X			X		X
2	NAR_SS049_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35341		X						X
3	NAR_SS050_0.4	Mar 28, 2018		Soil	M18-Ma35342			X				X	X
4	NAR_SS050_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35343		X						X
5	NAR_SS041_0.4	Mar 28, 2018		Soil	M18-Ma35344			X			X		X
6	NAR_SS041_	Mar 28, 2018		AUS Leachate	M18-Ma35345		X						X

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Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217													
Brisbane Laboratory - NATA Site # 20794							X	X	X	X			X
Perth Laboratory - NATA Site # 23736													
	0.4												
7	NAR_SS040_0.6	Mar 28, 2018		Soil	M18-Ma35346			X			X		X
8	NAR_SS040_0.6	Mar 28, 2018		AUS Leachate	M18-Ma35347		X						X
9	NAR_SS039_0.4	Mar 28, 2018		Soil	M18-Ma35348			X			X		X
10	NAR_SS039_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35349		X						X
11	NAR_SS036A_0.3	Mar 28, 2018		Soil	M18-Ma35350			X				X	X
12	NAR_SS036A_0.3	Mar 28, 2018		AUS Leachate	M18-Ma35351		X						X
13	NAR_SS035_	Mar 28, 2018		Soil	M18-Ma35352			X		X	X		X

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Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217													
Brisbane Laboratory - NATA Site # 20794							X	X	X	X			X
Perth Laboratory - NATA Site # 23736													
	0.55												
14	NAR_SS035_ 0.55	Mar 28, 2018		AUS Leachate	M18-Ma35353		X						X
15	ZULU_SS003_ 0.4	Mar 28, 2018		Soil	M18-Ma35354			X			X		X
16	ZULU_SS003_ 0.4	Mar 28, 2018		AUS Leachate	M18-Ma35355		X						X
17	ZULU_SS004_ 0.24	Mar 28, 2018		Soil	M18-Ma35356			X			X		X
18	ZULU_SS004_ 0.24	Mar 28, 2018		AUS Leachate	M18-Ma35357		X						X
19	NAR_QAQC1_ 280318	Mar 28, 2018		Soil	M18-Ma35358				X				X
20	NAR_QAQC1_	Mar 28, 2018		AUS Leachate	M18-Ma35359		X						X

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Eurofins | mgt Analytical Services Manager : [redacted]

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Sydney Laboratory - NATA Site # 18217													
Brisbane Laboratory - NATA Site # 20794							X	X	X	X			X
Perth Laboratory - NATA Site # 23736													
	280318												
21	ZULU_R1_280318	Mar 28, 2018		Water	M18-Ma35360						X		X
22	ZULU_SS002_0.4	Mar 28, 2018		Soil	M18-Ma35361			X			X		X
23	ZULU_SS002_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35362		X						X
24	ZULU_SS001_0.4	Mar 28, 2018		Soil	M18-Ma35363			X				X	X
25	ZULU_SS001_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35364		X						X
26	ZULU_SS051_0.4	Mar 28, 2018		Soil	M18-Ma35365			X			X		X
27	ZULU_SS051_	Mar 28, 2018		AUS Leachate	M18-Ma35366		X						X

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Order No.:
Report #: 591863
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Mar 28, 2018 6:34 PM
Due: Apr 9, 2018
Priority: 5 Day
Contact Name: [redacted]

Project Name: TAXIWAY ZULU AND NORTHERN ACCESS ROUTE
Project ID: IS025200-550

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217													
Brisbane Laboratory - NATA Site # 20794							X	X	X	X			X
Perth Laboratory - NATA Site # 23736													
	0.4												
28	ZULU_SS005_0.11	Mar 28, 2018		Soil	M18-Ma35367				X				X
29	ZULU_SS005_0.11	Mar 28, 2018		AUS Leachate	M18-Ma35368		X						X
30	ZULU_SS006_0.45	Mar 28, 2018		Soil	M18-Ma35369			X			X		X
31	ZULU_SS006_0.45	Mar 28, 2018		AUS Leachate	M18-Ma35370		X						X
32	ZULU_SS007_0.4	Mar 28, 2018		Soil	M18-Ma35371			X			X		X
33	ZULU_SS007_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35372		X						X
34	ZULU_SS008_	Mar 28, 2018		Soil	M18-Ma35373			X			X		X

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Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217													
Brisbane Laboratory - NATA Site # 20794							X	X	X	X			X
Perth Laboratory - NATA Site # 23736													
	0.4												
35	ZULU_SS008_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35374		X						X
36	ZULU_SS009_0.3	Mar 28, 2018		Soil	M18-Ma35375			X				X	X
37	ZULU_SS009_0.3	Mar 28, 2018		AUS Leachate	M18-Ma35376		X						X
38	SB3982	Mar 28, 2018		Soil	M18-Ma35377	X							
39	ZULU_SS007_1.1	Mar 28, 2018		Soil	M18-Ma35378	X							
40	ZULU_SS008_1.2	Mar 28, 2018		Soil	M18-Ma35379	X							
41	ZULU_SS009_0.92	Mar 28, 2018		Soil	M18-Ma35380	X							

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Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail	HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271	X		X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794		X	X	X	X			X
Perth Laboratory - NATA Site # 23736								
Test Counts	4	18	18	18	1	13	4	37

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

QC Data General Comments

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

Quality Control Results

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

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M18-Ma35343	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma35343	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma35343	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma35343	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma35343	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma35343	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma35343	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma35343	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma35343	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma35343	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma35343	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkane sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M18-Ma35343	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma35343	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma35343	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma35343	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma35343	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma35343	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma35343	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkane sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M18-Ma35343	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma35343	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma35343	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma35343	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma35343	CP	ug/L	0.33	0.28	15	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma35343	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma35343	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma35343	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma35343	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma35343	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M18-Ma35351	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma35351	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma35351	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma35351	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma35351	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma35351	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma35351	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma35351	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma35351	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma35351	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma35351	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkane sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M18-Ma35351	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma35351	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma35351	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma35351	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma35351	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma35351	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma35351	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkane sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M18-Ma35351	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma35351	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma35351	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma35351	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma35351	CP	ug/L	0.09	0.09	5.0	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma35351	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma35351	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma35351	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma35351	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma35351	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M18-Ma35357	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma35357	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma35357	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma35357	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma35357	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma35357	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma35357	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma35357	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma35357	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma35357	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma35357	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkane sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M18-Ma35357	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma35357	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma35357	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma35357	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma35357	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma35357	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma35357	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkane sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M18-Ma35357	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma35357	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma35357	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma35357	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma35357	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma35357	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma35357	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma35357	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma35357	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma35357	CP	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
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised By

[redacted]

Analytical Services Manager
Senior Analyst-Organic (QLD)

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 History

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

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

Description	Testing Site	Extracted	Holding Time
Vic EPA IWRG 621 (Solids)			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Apr 03, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C36			
Volatile Organics	Melbourne	Apr 03, 2018	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 03, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 03, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Apr 03, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Organochlorine Pesticides	Melbourne	Apr 03, 2018	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Melbourne	Apr 03, 2018	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Phenols (Halogenated)	Melbourne	Apr 03, 2018	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Melbourne	Apr 03, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Chromium (hexavalent)	Melbourne	Apr 03, 2018	28 Day
- Method: APHA 3500-Cr Hexavalent Chromium- (Extraction:- USEPA3060)			
Cyanide (total)	Melbourne	Apr 03, 2018	14 Day
- Method: LTM-INO-4020 Total Free WAD Cyanide by CFA			
Fluoride	Melbourne	Apr 04, 2018	28 Day
- Method: LTM-INO-4150 Determination of Total Fluoride PART A – CIC			
pH (1:5 Aqueous extract at 25°C as rec.)	Melbourne	Apr 03, 2018	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
IWRG 621 Metals : Metals M12	Melbourne	Apr 03, 2018	28 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
Eurofins | mgt Suite B7			
BTEX	Melbourne	Apr 03, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8	Melbourne	Apr 03, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Per- and Polyfluorinated Alkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Apr 06, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
Perfluoroalkane sulfonamido substances	Brisbane	Apr 06, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
Perfluoroalkane sulfonic acids (PFSAs)	Brisbane	Apr 06, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Apr 06, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
NEPM Screen for Soil Classification			
% Clay	Brisbane	Apr 06, 2018	6 Day
- Method: LTM-GEN-7040			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Melbourne	Apr 03, 2018	7 Day
- Method: LTM-INO-4030 Conductivity			
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Melbourne	Apr 03, 2018	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			

Description	Testing Site	Extracted	Holding Time
Total Organic Carbon	Melbourne	Apr 09, 2018	28 Day
- Method: APHA 5310B Total Organic Carbon			
Heavy Metals	Melbourne	Apr 03, 2018	180 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
Cation Exchange Capacity	Melbourne	Apr 04, 2018	180 Days
- Method: LTM-MET-3060 - Cation Exchange Capacity (CEC) & Exchangeable Sodium Percentage (ESP)			
% Moisture	Melbourne	Mar 29, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

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Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Project Name: TAXIWAY ZULU AND NORTHERN ACCESS ROUTE
Project ID: IS025200-550

Order No.:
Report #: 591863
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Mar 28, 2018 6:34 PM
Due: Apr 9, 2018
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217													
Brisbane Laboratory - NATA Site # 20794							X	X	X	X			X
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	NAR_SS049_0.4	Mar 28, 2018		Soil	M18-Ma35340			X			X		X
2	NAR_SS049_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35341		X						X
3	NAR_SS050_0.4	Mar 28, 2018		Soil	M18-Ma35342			X				X	X
4	NAR_SS050_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35343		X						X
5	NAR_SS041_0.4	Mar 28, 2018		Soil	M18-Ma35344			X			X		X
6	NAR_SS041_	Mar 28, 2018		AUS Leachate	M18-Ma35345		X						X

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Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217													
Brisbane Laboratory - NATA Site # 20794							X	X	X	X			X
Perth Laboratory - NATA Site # 23736													
	0.4												
7	NAR_SS040_0.6	Mar 28, 2018		Soil	M18-Ma35346			X			X		X
8	NAR_SS040_0.6	Mar 28, 2018		AUS Leachate	M18-Ma35347		X						X
9	NAR_SS039_0.4	Mar 28, 2018		Soil	M18-Ma35348			X			X		X
10	NAR_SS039_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35349		X						X
11	NAR_SS036A_0.3	Mar 28, 2018		Soil	M18-Ma35350			X				X	X
12	NAR_SS036A_0.3	Mar 28, 2018		AUS Leachate	M18-Ma35351		X						X
13	NAR_SS035_	Mar 28, 2018		Soil	M18-Ma35352			X		X	X		X

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Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217													
Brisbane Laboratory - NATA Site # 20794							X	X	X	X			X
Perth Laboratory - NATA Site # 23736													
	0.55												
14	NAR_SS035_ 0.55	Mar 28, 2018		AUS Leachate	M18-Ma35353		X						X
15	ZULU_SS003_ 0.4	Mar 28, 2018		Soil	M18-Ma35354			X			X		X
16	ZULU_SS003_ 0.4	Mar 28, 2018		AUS Leachate	M18-Ma35355		X						X
17	ZULU_SS004_ 0.24	Mar 28, 2018		Soil	M18-Ma35356			X			X		X
18	ZULU_SS004_ 0.24	Mar 28, 2018		AUS Leachate	M18-Ma35357		X						X
19	NAR_QAQC1_ 280318	Mar 28, 2018		Soil	M18-Ma35358				X				X
20	NAR_QAQC1_	Mar 28, 2018		AUS Leachate	M18-Ma35359		X						X

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Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217													
Brisbane Laboratory - NATA Site # 20794							X	X	X	X			X
Perth Laboratory - NATA Site # 23736													
	280318												
21	ZULU_R1_280318	Mar 28, 2018		Water	M18-Ma35360						X		X
22	ZULU_SS002_0.4	Mar 28, 2018		Soil	M18-Ma35361			X			X		X
23	ZULU_SS002_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35362		X						X
24	ZULU_SS001_0.4	Mar 28, 2018		Soil	M18-Ma35363			X				X	X
25	ZULU_SS001_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35364		X						X
26	ZULU_SS051_0.4	Mar 28, 2018		Soil	M18-Ma35365			X			X		X
27	ZULU_SS051_	Mar 28, 2018		AUS Leachate	M18-Ma35366		X						X

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Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217													
Brisbane Laboratory - NATA Site # 20794							X	X	X	X			X
Perth Laboratory - NATA Site # 23736													
	0.4												
28	ZULU_SS005_0.11	Mar 28, 2018		Soil	M18-Ma35367				X				X
29	ZULU_SS005_0.11	Mar 28, 2018		AUS Leachate	M18-Ma35368		X						X
30	ZULU_SS006_0.45	Mar 28, 2018		Soil	M18-Ma35369			X			X		X
31	ZULU_SS006_0.45	Mar 28, 2018		AUS Leachate	M18-Ma35370		X						X
32	ZULU_SS007_0.4	Mar 28, 2018		Soil	M18-Ma35371			X			X		X
33	ZULU_SS007_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35372		X						X
34	ZULU_SS008_	Mar 28, 2018		Soil	M18-Ma35373			X			X		X

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Project ID: IS025200-550

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217													
Brisbane Laboratory - NATA Site # 20794							X	X	X	X			X
Perth Laboratory - NATA Site # 23736													
	0.4												
35	ZULU_SS008_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35374		X						X
36	ZULU_SS009_0.3	Mar 28, 2018		Soil	M18-Ma35375			X				X	X
37	ZULU_SS009_0.3	Mar 28, 2018		AUS Leachate	M18-Ma35376		X						X
38	SB3982	Mar 28, 2018		Soil	M18-Ma35377	X							
39	ZULU_SS007_1.1	Mar 28, 2018		Soil	M18-Ma35378	X							
40	ZULU_SS008_1.2	Mar 28, 2018		Soil	M18-Ma35379	X							
41	ZULU_SS009_0.92	Mar 28, 2018		Soil	M18-Ma35380	X							

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Company Name:	Jacobs Group (Australia) P/L VIC	**Order No.:**		**Received:**	Mar 28, 2018 6:34 PM
Address:	PO Box 312 Flinders Lane	**Report #:**	591863	**Due:**	Apr 9, 2018
	Melbourne	**Phone:**	03 8668 3000	**Priority:**	5 Day
	VIC 8009	**Fax:**	03 8668 3001	**Contact Name:**	[redacted]
Project Name:	TAXIWAY ZULU AND NORTHERN ACCESS ROUTE				
Project ID:	IS025200-550				

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail	HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271	X		X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794		X	X	X	X			X
Perth Laboratory - NATA Site # 23736								
Test Counts	4	18	18	18	1	13	4	37

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
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							
Volatile Organics							
1.2.4-Trichlorobenzene	mg/kg	< 0.5			0.5	Pass	
Hexachlorobutadiene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.4.6-Trichlorophenol	mg/kg	< 1			1.0	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1.0	Pass	
Pentachlorophenol	mg/kg	< 1			1.0	Pass	
Tetrachlorophenols - Total	mg/kg	< 1			1.0	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
2-Nitrophenol	mg/kg	< 1			1.0	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkane sulfonamido substances							
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 (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
Method Blank							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
% Clay	%	< 1			1	Pass	
Chromium (hexavalent)	mg/kg	< 1			1	Pass	
Cyanide (total)	mg/kg	< 5			5	Pass	
Fluoride	mg/kg	< 100			100	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	114			70-130	Pass	
TRH C10-C14	%	95			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	93			70-130	Pass	
Toluene	%	89			70-130	Pass	
Ethylbenzene	%	90			70-130	Pass	
m&p-Xylenes	%	99			70-130	Pass	
Xylenes - Total	%	96			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	116			70-130	Pass	
TRH C6-C10	%	116			70-130	Pass	
TRH >C10-C16	%	98			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	93			70-130	Pass	
Acenaphthylene	%	99			70-130	Pass	
Anthracene	%	93			70-130	Pass	
Benz(a)anthracene	%	77			70-130	Pass	
Benzo(a)pyrene	%	95			70-130	Pass	
Benzo(b&j)fluoranthene	%	74			70-130	Pass	
Benzo(g.h.i)perylene	%	70			70-130	Pass	
Benzo(k)fluoranthene	%	100			70-130	Pass	
Chrysene	%	93			70-130	Pass	
Dibenz(a.h)anthracene	%	72			70-130	Pass	
Fluoranthene	%	80			70-130	Pass	
Fluorene	%	98			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	70			70-130	Pass	
Naphthalene	%	101			70-130	Pass	
Phenanthrene	%	102			70-130	Pass	
Pyrene	%	75			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	68			30-130	Pass	
2.4-Dichlorophenol	%	59			30-130	Pass	
2.4.5-Trichlorophenol	%	56			30-130	Pass	
2.4.6-Trichlorophenol	%	83			30-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.6-Dichlorophenol	%	61			30-130	Pass	
4-Chloro-3-methylphenol	%	56			30-130	Pass	
Pentachlorophenol	%	53			30-130	Pass	
Tetrachlorophenols - Total	%	55			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	44			30-130	Pass	
2-Methyl-4.6-dinitrophenol	%	50			30-130	Pass	
2-Methylphenol (o-Cresol)	%	84			30-130	Pass	
2-Nitrophenol	%	58			30-130	Pass	
2.4-Dimethylphenol	%	53			30-130	Pass	
2.4-Dinitrophenol	%	47			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	59			30-130	Pass	
4-Nitrophenol	%	44			30-130	Pass	
Dinoseb	%	52			30-130	Pass	
Phenol	%	68			30-130	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	96			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	98			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	101			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	99			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	99			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	89			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	100			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	98			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	99			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	98			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	98			50-150	Pass	
LCS - % Recovery							
Perfluoroalkane sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	89			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	99			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	105			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	105			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	129			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	96			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	126			50-150	Pass	
LCS - % Recovery							
Perfluoroalkane sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	103			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	100			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	97			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	92			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	105			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	106			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	115			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	122			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	120			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	121			50-150	Pass	
LCS - % Recovery							
% Clay	%	93			70-130	Pass	
Fluoride	%	109			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M18-Ma35342	CP	%	74			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M18-Ma35342	CP	%	76			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-Ma35342	CP	%	90			70-130	Pass	
Acenaphthylene	M18-Ma35342	CP	%	96			70-130	Pass	
Anthracene	M18-Ma35342	CP	%	106			70-130	Pass	
Benz(a)anthracene	M18-Ma35342	CP	%	81			70-130	Pass	
Benzo(a)pyrene	M18-Ma35342	CP	%	85			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Ma35342	CP	%	96			70-130	Pass	
Benzo(g.h.i)perylene	M18-Ma35342	CP	%	79			70-130	Pass	
Benzo(k)fluoranthene	M18-Ma35342	CP	%	112			70-130	Pass	
Chrysene	M18-Ma35342	CP	%	97			70-130	Pass	
Dibenz(a.h)anthracene	M18-Ma35342	CP	%	86			70-130	Pass	
Fluoranthene	M18-Ma35342	CP	%	87			70-130	Pass	
Fluorene	M18-Ma35342	CP	%	98			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ma35342	CP	%	83			70-130	Pass	
Naphthalene	M18-Ma35342	CP	%	85			70-130	Pass	
Phenanthrene	M18-Ma35342	CP	%	93			70-130	Pass	
Pyrene	M18-Ma35342	CP	%	86			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	M18-Ma35342	CP	%	85			30-130	Pass	
2.4-Dichlorophenol	M18-Ma35342	CP	%	94			30-130	Pass	
2.4.5-Trichlorophenol	M18-Ma35342	CP	%	102			30-130	Pass	
2.4.6-Trichlorophenol	M18-Ma35342	CP	%	59			30-130	Pass	
2.6-Dichlorophenol	M18-Ma35342	CP	%	112			30-130	Pass	
4-Chloro-3-methylphenol	M18-Ma35342	CP	%	103			30-130	Pass	
Pentachlorophenol	M18-Ma35342	CP	%	85			30-130	Pass	
Tetrachlorophenols - Total	M18-Ma35342	CP	%	71			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Methylphenol (o-Cresol)	M18-Ma35342	CP	%	81			30-130	Pass	
2-Nitrophenol	M18-Ma35342	CP	%	103			30-130	Pass	
2.4-Dimethylphenol	M18-Ma35342	CP	%	104			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M18-Ma35342	CP	%	87			30-130	Pass	
4-Nitrophenol	M18-Ma35342	CP	%	99			30-130	Pass	
Dinoseb	M18-Ma35342	CP	%	45			30-130	Pass	
Phenol	M18-Ma35342	CP	%	83			30-130	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M18-Ma35342	CP	%	99			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma35342	CP	%	93			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma35342	CP	%	102			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma35342	CP	%	100			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma35342	CP	%	101			50-150	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma35342	CP	%	86			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma35342	CP	%	101			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma35342	CP	%	95			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorododecanoic acid (PFDoDA)	M18-Ma35342	CP	%	98			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma35342	CP	%	99			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma35342	CP	%	96			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M18-Ma35342	CP	%	99			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma35342	CP	%	98			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma35342	CP	%	103			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma35342	CP	%	103			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma35342	CP	%	127			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma35342	CP	%	93			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma35342	CP	%	129			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M18-Ma35342	CP	%	103			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma35342	CP	%	97			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma35342	CP	%	99			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma35342	CP	%	93			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma35342	CP	%	148			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma35342	CP	%	105			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma35342	CP	%	105			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma35342	CP	%	106			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma35342	CP	%	106			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma35342	CP	%	98			50-150	Pass	
Spike - % Recovery									
				Result 1					
Fluoride	M18-Ma35342	CP	%	66			70-130	Fail	Q08
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Ma35350	CP	%	95			75-125	Pass	
Cadmium	M18-Ma35350	CP	%	101			75-125	Pass	
Chromium	M18-Ma35350	CP	%	99			75-125	Pass	
Copper	M18-Ma35350	CP	%	92			75-125	Pass	
Lead	M18-Ma35350	CP	%	95			75-125	Pass	
Mercury	M18-Ma35350	CP	%	90			70-130	Pass	
Molybdenum	M18-Ma35350	CP	%	102			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Nickel	M18-Ma35350	CP	%	97			75-125	Pass	
Selenium	M18-Ma35350	CP	%	97			75-125	Pass	
Silver	M18-Ma35350	CP	%	102			75-125	Pass	
Tin	M18-Ma35350	CP	%	100			75-125	Pass	
Zinc	M18-Ma35350	CP	%	90			75-125	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	M18-Ma35363	CP	%	127			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M18-Ma35365	CP	%	94			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M18-Ma35365	CP	%	83			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-Ma35365	CP	%	71			70-130	Pass	
Acenaphthylene	M18-Ma35365	CP	%	77			70-130	Pass	
Anthracene	M18-Ma35365	CP	%	73			70-130	Pass	
Benz(a)anthracene	M18-Ma35365	CP	%	94			70-130	Pass	
Benzo(a)pyrene	M18-Ma35365	CP	%	73			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Ma35365	CP	%	77			70-130	Pass	
Benzo(g.h.i)perylene	M18-Ma35365	CP	%	86			70-130	Pass	
Benzo(k)fluoranthene	M18-Ma35365	CP	%	72			70-130	Pass	
Chrysene	M18-Ma35365	CP	%	85			70-130	Pass	
Dibenz(a.h)anthracene	M18-Ma35365	CP	%	90			70-130	Pass	
Fluoranthene	M18-Ma35365	CP	%	93			70-130	Pass	
Fluorene	M18-Ma35365	CP	%	76			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ma35365	CP	%	86			70-130	Pass	
Naphthalene	M18-Ma35365	CP	%	78			70-130	Pass	
Phenanthrene	M18-Ma35365	CP	%	72			70-130	Pass	
Pyrene	M18-Ma35365	CP	%	82			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	M18-Ma35365	CP	%	79			30-130	Pass	
2.4-Dichlorophenol	M18-Ma35365	CP	%	71			30-130	Pass	
2.4.5-Trichlorophenol	M18-Ma35365	CP	%	70			30-130	Pass	
2.4.6-Trichlorophenol	M18-Ma35365	CP	%	75			30-130	Pass	
2.6-Dichlorophenol	M18-Ma35365	CP	%	74			30-130	Pass	
4-Chloro-3-methylphenol	M18-Ma35365	CP	%	69			30-130	Pass	
Pentachlorophenol	M18-Ma35365	CP	%	58			30-130	Pass	
Tetrachlorophenols - Total	M18-Ma35365	CP	%	65			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	M18-Ma35365	CP	%	57			30-130	Pass	
2-Methyl-4.6-dinitrophenol	M18-Ma35365	CP	%	45			30-130	Pass	
2-Methylphenol (o-Cresol)	M18-Ma35365	CP	%	78			30-130	Pass	
2-Nitrophenol	M18-Ma35365	CP	%	67			30-130	Pass	
2.4-Dimethylphenol	M18-Ma35365	CP	%	62			30-130	Pass	
2.4-Dinitrophenol	M18-Ma35365	CP	%	63			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M18-Ma35365	CP	%	69			30-130	Pass	
4-Nitrophenol	M18-Ma35365	CP	%	54			30-130	Pass	
Dinoseb	M18-Ma35365	CP	%	57			30-130	Pass	
Phenol	M18-Ma35365	CP	%	83			30-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Ma35375	CP	%	90			75-125	Pass	
Cadmium	M18-Ma35375	CP	%	103			75-125	Pass	
Chromium	M18-Ma35375	CP	%	112			75-125	Pass	
Copper	M18-Ma35375	CP	%	106			75-125	Pass	
Lead	M18-Ma35375	CP	%	108			75-125	Pass	
Mercury	M18-Ma35375	CP	%	96			70-130	Pass	
Molybdenum	M18-Ma35375	CP	%	103			75-125	Pass	
Nickel	M18-Ma35375	CP	%	109			75-125	Pass	
Selenium	M18-Ma35375	CP	%	86			75-125	Pass	
Silver	M18-Ma35375	CP	%	107			75-125	Pass	
Tin	M18-Ma35375	CP	%	103			75-125	Pass	
Zinc	M18-Ma35375	CP	%	106			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M18-Ma35340	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M18-Ma35340	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M18-Ma35340	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M18-Ma35340	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M18-Ma35340	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M18-Ma35340	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	M18-Ma35340	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	M18-Ma35340	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	M18-Ma35340	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	M18-Ma35340	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	M18-Ma35340	CP	mg/kg	< 1	< 1	<1	30%	Pass	

Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M18-Ma35340	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M18-Ma35340	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M18-Ma35340	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	M18-Ma35340	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	M18-Ma35340	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M18-Ma35340	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	M18-Ma35340	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	M18-Ma35340	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	M18-Ma35340	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkane sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma35340	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma35340	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkane sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma35340	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma35340	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4-Trichlorobenzene	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Hexachlorobutadiene	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1-Dichloroethene	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1-Trichloroethane	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2-Trichloroethane	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dibromoethane	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloroethane	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloropropane	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.3-Trichloropropane	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichloropropane	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Butanone (MEK)	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Propanone (Acetone)	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Allyl chloride	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromochloromethane	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromodichloromethane	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon Tetrachloride	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chlorobenzene	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroethane	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.2-Dichloroethene	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.3-Dichloropropene	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorodifluoromethane	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Iodomethane	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Isopropyl benzene (Cumene)	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.2-Dichloroethene	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.3-Dichloropropene	M18-Ma34268	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M18-Ap04217	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M18-Ap04217	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M18-Ma36003	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M18-Ma36003	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M18-Ap04217	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M18-Ap04217	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M18-Ap04217	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M18-Ap04217	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M18-Ap04217	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M18-Ap04217	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M18-Ap04217	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M18-Ap04217	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Endrin	M18-Ap04217	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M18-Ap04217	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M18-Ap04217	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M18-Ap04217	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M18-Ap04217	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M18-Ap04217	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M18-Ap04217	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M18-Ap04217	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M18-Ap04217	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M18-Ap04217	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	M18-Ap04217	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	M18-Ap04217	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	M18-Ap04217	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	M18-Ap04217	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	M18-Ap04217	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	M18-Ap04217	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	M18-Ap04217	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	M18-Ap01080	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Cyanide (total)	M18-Ma35886	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	M18-Ap00634	NCP	pH Units	7.1	7.2	pass	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M18-Ma35344	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-Ma35344	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M18-Ma35344	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M18-Ma35344	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M18-Ma35344	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M18-Ma35344	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M18-Ma35344	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-Ma35344	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M18-Ma35344	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-Ma35348	CP	%	17	16	5.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Ma35348	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	M18-Ma35348	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Ma35348	CP	mg/kg	54	52	2.0	30%	Pass	
Copper	M18-Ma35348	CP	mg/kg	13	13	<1	30%	Pass	
Iron	M18-Ma35348	CP	mg/kg	29000	29000	2.0	30%	Pass	
Lead	M18-Ma35348	CP	mg/kg	10	12	12	30%	Pass	
Mercury	M18-Ma35348	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M18-Ma35348	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M18-Ma35348	CP	mg/kg	41	42	1.0	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Selenium	M18-Ma35348	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M18-Ma35348	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M18-Ma35348	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M18-Ma35348	CP	mg/kg	19	22	12	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Fluoride	M18-Ma35350	CP	mg/kg	120	130	14	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Ma35350	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	M18-Ma35350	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Ma35350	CP	mg/kg	45	46	1.0	30%	Pass	
Copper	M18-Ma35350	CP	mg/kg	28	28	1.0	30%	Pass	
Iron	M18-Ma35350	CP	mg/kg	33000	33000	1.0	30%	Pass	
Lead	M18-Ma35350	CP	mg/kg	7.3	7.6	3.0	30%	Pass	
Mercury	M18-Ma35350	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M18-Ma35350	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M18-Ma35350	CP	mg/kg	56	56	2.0	30%	Pass	
Selenium	M18-Ma35350	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M18-Ma35350	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M18-Ma35350	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M18-Ma35350	CP	mg/kg	54	55	2.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Clay	B18-Ja08896	NCP	%	**	**	8.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M18-Ma35361	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-Ma35361	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M18-Ma35361	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M18-Ma35361	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M18-Ma35361	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M18-Ma35361	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M18-Ma35361	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-Ma35361	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M18-Ma35361	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M18-Ma35363	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M18-Ma35363	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M18-Ma35363	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M18-Ma35363	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M18-Ma35363	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M18-Ma35363	CP	mg/kg	< 100	< 100	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	M18-Ma35363	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	M18-Ma35363	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	M18-Ma35363	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	M18-Ma35363	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	M18-Ma35363	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M18-Ma35363	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M18-Ma35363	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M18-Ma35363	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	M18-Ma35363	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	M18-Ma35363	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M18-Ma35363	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	M18-Ma35363	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	M18-Ma35363	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	M18-Ma35363	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-Ma35373	CP	%	17	18	1.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Ma35373	CP	mg/kg	2.0	2.2	7.0	30%	Pass	
Cadmium	M18-Ma35373	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Ma35373	CP	mg/kg	89	90	1.0	30%	Pass	
Copper	M18-Ma35373	CP	mg/kg	23	24	6.0	30%	Pass	
Iron	M18-Ma35373	CP	mg/kg	41000	42000	2.0	30%	Pass	
Lead	M18-Ma35373	CP	mg/kg	11	12	6.0	30%	Pass	
Mercury	M18-Ma35373	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M18-Ma35373	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M18-Ma35373	CP	mg/kg	61	65	6.0	30%	Pass	
Selenium	M18-Ma35373	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M18-Ma35373	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Tin	M18-Ma35373	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M18-Ma35373	CP	mg/kg	26	26	1.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Ma35375	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	M18-Ma35375	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Ma35375	CP	mg/kg	36	37	2.0	30%	Pass	
Copper	M18-Ma35375	CP	mg/kg	13	13	1.0	30%	Pass	
Iron	M18-Ma35375	CP	mg/kg	21000	21000	1.0	30%	Pass	
Lead	M18-Ma35375	CP	mg/kg	11	11	<1	30%	Pass	
Mercury	M18-Ma35375	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M18-Ma35375	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M18-Ma35375	CP	mg/kg	25	26	1.0	30%	Pass	
Selenium	M18-Ma35375	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M18-Ma35375	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M18-Ma35375	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M18-Ma35375	CP	mg/kg	20	21	1.0	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference

Authorised By

[redacted]

Analytical Services Manager
Senior Analyst-Metal (VIC)
Senior Analyst-Volatile (VIC)
Senior Analyst-Inorganic (QLD)
Senior Analyst-Organic (QLD)
Senior Analyst-Organic (VIC)
Senior Analyst-Inorganic (VIC)
Senior Analyst-Metal (QLD)

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 History

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

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

Description	Testing Site	Extracted	Holding Time
Vic EPA IWRG 621 (Solids)			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Apr 06, 2018	7 Day
- Method: LTM-ORG-2010 TRH C6-C36			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 03, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 06, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Apr 06, 2018	7 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Eurofins | mgt Suite B7			
BTEX	Melbourne	Apr 03, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8	Melbourne	Apr 03, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Per- and Polyfluorinated Alkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Apr 08, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
Perfluoroalkane sulfonamido substances	Brisbane	Apr 08, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
Perfluoroalkane sulfonic acids (PFSAs)	Brisbane	Apr 08, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Apr 08, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			

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Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Project Name: TAXIWAY ZULU AND NORTHERN ACCESS ROUTE
Project ID: IS025200-550

Order No.:
Report #: 591863
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Mar 28, 2018 6:34 PM
Due: Apr 9, 2018
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217													
Brisbane Laboratory - NATA Site # 20794							X	X	X	X			X
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	NAR_SS049_0.4	Mar 28, 2018		Soil	M18-Ma35340			X			X		X
2	NAR_SS049_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35341		X						X
3	NAR_SS050_0.4	Mar 28, 2018		Soil	M18-Ma35342			X				X	X
4	NAR_SS050_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35343		X						X
5	NAR_SS041_0.4	Mar 28, 2018		Soil	M18-Ma35344			X			X		X
6	NAR_SS041_	Mar 28, 2018		AUS Leachate	M18-Ma35345		X						X

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Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Order No.:
Report #: 591863
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Mar 28, 2018 6:34 PM
Due: Apr 9, 2018
Priority: 5 Day
Contact Name: [redacted]

Project Name: TAXIWAY ZULU AND NORTHERN ACCESS ROUTE
Project ID: IS025200-550

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217													
Brisbane Laboratory - NATA Site # 20794							X	X	X	X			X
Perth Laboratory - NATA Site # 23736													
	0.4												
7	NAR_SS040_0.6	Mar 28, 2018		Soil	M18-Ma35346			X			X		X
8	NAR_SS040_0.6	Mar 28, 2018		AUS Leachate	M18-Ma35347		X						X
9	NAR_SS039_0.4	Mar 28, 2018		Soil	M18-Ma35348			X			X		X
10	NAR_SS039_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35349		X						X
11	NAR_SS036A_0.3	Mar 28, 2018		Soil	M18-Ma35350			X				X	X
12	NAR_SS036A_0.3	Mar 28, 2018		AUS Leachate	M18-Ma35351		X						X
13	NAR_SS035_	Mar 28, 2018		Soil	M18-Ma35352			X		X	X		X

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Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217													
Brisbane Laboratory - NATA Site # 20794							X	X	X	X			X
Perth Laboratory - NATA Site # 23736													
	0.55												
14	NAR_SS035_ 0.55	Mar 28, 2018		AUS Leachate	M18-Ma35353		X						X
15	ZULU_SS003_ 0.4	Mar 28, 2018		Soil	M18-Ma35354			X			X		X
16	ZULU_SS003_ 0.4	Mar 28, 2018		AUS Leachate	M18-Ma35355		X						X
17	ZULU_SS004_ 0.24	Mar 28, 2018		Soil	M18-Ma35356			X			X		X
18	ZULU_SS004_ 0.24	Mar 28, 2018		AUS Leachate	M18-Ma35357		X						X
19	NAR_QAQC1_ 280318	Mar 28, 2018		Soil	M18-Ma35358				X				X
20	NAR_QAQC1_	Mar 28, 2018		AUS Leachate	M18-Ma35359		X						X

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Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217													
Brisbane Laboratory - NATA Site # 20794							X	X	X	X			X
Perth Laboratory - NATA Site # 23736													
	280318												
21	ZULU_R1_280318	Mar 28, 2018		Water	M18-Ma35360						X		X
22	ZULU_SS002_0.4	Mar 28, 2018		Soil	M18-Ma35361			X			X		X
23	ZULU_SS002_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35362		X						X
24	ZULU_SS001_0.4	Mar 28, 2018		Soil	M18-Ma35363			X				X	X
25	ZULU_SS001_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35364		X						X
26	ZULU_SS051_0.4	Mar 28, 2018		Soil	M18-Ma35365			X			X		X
27	ZULU_SS051_	Mar 28, 2018		AUS Leachate	M18-Ma35366		X						X

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Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217													
Brisbane Laboratory - NATA Site # 20794							X	X	X	X			X
Perth Laboratory - NATA Site # 23736													
	0.4												
28	ZULU_SS005_0.11	Mar 28, 2018		Soil	M18-Ma35367				X				X
29	ZULU_SS005_0.11	Mar 28, 2018		AUS Leachate	M18-Ma35368		X						X
30	ZULU_SS006_0.45	Mar 28, 2018		Soil	M18-Ma35369			X			X		X
31	ZULU_SS006_0.45	Mar 28, 2018		AUS Leachate	M18-Ma35370		X						X
32	ZULU_SS007_0.4	Mar 28, 2018		Soil	M18-Ma35371			X			X		X
33	ZULU_SS007_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35372		X						X
34	ZULU_SS008_	Mar 28, 2018		Soil	M18-Ma35373			X			X		X

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Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217													
Brisbane Laboratory - NATA Site # 20794							X	X	X	X			X
Perth Laboratory - NATA Site # 23736													
	0.4												
35	ZULU_SS008_0.4	Mar 28, 2018		AUS Leachate	M18-Ma35374		X						X
36	ZULU_SS009_0.3	Mar 28, 2018		Soil	M18-Ma35375			X				X	X
37	ZULU_SS009_0.3	Mar 28, 2018		AUS Leachate	M18-Ma35376		X						X
38	SB3982	Mar 28, 2018		Soil	M18-Ma35377	X							
39	ZULU_SS007_1.1	Mar 28, 2018		Soil	M18-Ma35378	X							
40	ZULU_SS008_1.2	Mar 28, 2018		Soil	M18-Ma35379	X							
41	ZULU_SS009_0.92	Mar 28, 2018		Soil	M18-Ma35380	X							

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Melbourne Laboratory - NATA Site # 1254 & 14271	X		X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794		X	X	X	X			X
Perth Laboratory - NATA Site # 23736								
Test Counts	4	18	18	18	1	13	4	37

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
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							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkane sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkane sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	93			70-130	Pass	
TRH C10-C14	%	122			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	88			70-130	Pass	
Toluene	%	82			70-130	Pass	
Ethylbenzene	%	86			70-130	Pass	
m&p-Xylenes	%	97			70-130	Pass	
Xylenes - Total	%	95			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	78			70-130	Pass	
TRH C6-C10	%	97			70-130	Pass	
TRH >C10-C16	%	110			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	81			70-130	Pass	
Acenaphthylene	%	86			70-130	Pass	
Anthracene	%	94			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benz(a)anthracene	%	104			70-130	Pass	
Benzo(a)pyrene	%	83			70-130	Pass	
Benzo(b&j)fluoranthene	%	78			70-130	Pass	
Benzo(g.h.i)perylene	%	84			70-130	Pass	
Benzo(k)fluoranthene	%	84			70-130	Pass	
Chrysene	%	97			70-130	Pass	
Dibenz(a.h)anthracene	%	96			70-130	Pass	
Fluoranthene	%	100			70-130	Pass	
Fluorene	%	86			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	84			70-130	Pass	
Naphthalene	%	119			70-130	Pass	
Phenanthrene	%	85			70-130	Pass	
Pyrene	%	95			70-130	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	100			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	104			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	118			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	104			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	106			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	110			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	104			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	104			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	118			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	104			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	98			50-150	Pass	
LCS - % Recovery							
Perfluoroalkane sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	106			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	76			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	72			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	112			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	98			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	96			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	110			50-150	Pass	
LCS - % Recovery							
Perfluoroalkane sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	100			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	98			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	110			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	110			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	102			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	108			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	108			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	94			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	102			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	62			50-150	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	94			80-120	Pass	
Cadmium	%	93			80-120	Pass	
Chromium	%	93			80-120	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Copper			%	94			80-120	Pass	
Lead			%	97			80-120	Pass	
Mercury			%	93			75-125	Pass	
Nickel			%	96			80-120	Pass	
Zinc			%	94			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M18-Ma35756	NCP	%	88			70-130	Pass	
TRH C10-C14	M18-Ma36288	NCP	%	70			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-Ma35756	NCP	%	86			70-130	Pass	
Toluene	M18-Ma35756	NCP	%	83			70-130	Pass	
Ethylbenzene	M18-Ma35756	NCP	%	83			70-130	Pass	
m&p-Xylenes	M18-Ma35756	NCP	%	96			70-130	Pass	
o-Xylene	M18-Ma35756	NCP	%	89			70-130	Pass	
Xylenes - Total	M18-Ma35756	NCP	%	94			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-Ma35756	NCP	%	78			70-130	Pass	
TRH C6-C10	M18-Ma35756	NCP	%	91			70-130	Pass	
TRH >C10-C16	M18-Ma36288	NCP	%	71			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-Ma33922	NCP	%	75			70-130	Pass	
Acenaphthylene	M18-Ma33922	NCP	%	84			70-130	Pass	
Anthracene	M18-Ma33922	NCP	%	88			70-130	Pass	
Benz(a)anthracene	M18-Ma33922	NCP	%	101			70-130	Pass	
Benzo(a)pyrene	M18-Ma33922	NCP	%	82			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Ma33922	NCP	%	96			70-130	Pass	
Benzo(g.h.i)perylene	M18-Ma33922	NCP	%	96			70-130	Pass	
Benzo(k)fluoranthene	M18-Ma33922	NCP	%	86			70-130	Pass	
Chrysene	M18-Ma33922	NCP	%	102			70-130	Pass	
Dibenz(a.h)anthracene	M18-Ma33922	NCP	%	93			70-130	Pass	
Fluoranthene	M18-Ma33922	NCP	%	110			70-130	Pass	
Fluorene	M18-Ma33922	NCP	%	87			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ma33922	NCP	%	96			70-130	Pass	
Naphthalene	M18-Ma33922	NCP	%	77			70-130	Pass	
Phenanthrene	M18-Ma33922	NCP	%	83			70-130	Pass	
Pyrene	M18-Ma33922	NCP	%	104			70-130	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M18-Ma35360	CP	%	97			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma35360	CP	%	110			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma35360	CP	%	118			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma35360	CP	%	102			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma35360	CP	%	106			50-150	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma35360	CP	%	109			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma35360	CP	%	94			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma35360	CP	%	87			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma35360	CP	%	89			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorotridecanoic acid (PFTrDA)	M18-Ma35360	CP	%	68			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma35360	CP	%	79			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M18-Ma35360	CP	%	100			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma35360	CP	%	81			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma35360	CP	%	76			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma35360	CP	%	103			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma35360	CP	%	79			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma35360	CP	%	82			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma35360	CP	%	102			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M18-Ma35360	CP	%	101			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma35360	CP	%	97			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma35360	CP	%	106			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma35360	CP	%	106			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma35360	CP	%	96			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma35360	CP	%	74			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma35360	CP	%	109			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma35360	CP	%	105			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma35360	CP	%	115			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma35360	CP	%	56			50-150	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Ma35744	NCP	%	96			75-125	Pass	
Cadmium	M18-Ma35744	NCP	%	95			75-125	Pass	
Chromium	M18-Ap00760	NCP	%	115			75-125	Pass	
Copper	M18-Ma35744	NCP	%	98			75-125	Pass	
Lead	M18-Ma35744	NCP	%	99			75-125	Pass	
Mercury	M18-Ma35744	NCP	%	92			70-130	Pass	
Nickel	M18-Ma35744	NCP	%	119			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M18-Ma35753	NCP	mg/L	0.04	0.06	26	30%	Pass	
TRH C10-C14	M18-Ma35360	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M18-Ma35360	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M18-Ma35360	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-Ma35753	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M18-Ma35753	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M18-Ma35753	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M18-Ma35753	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M18-Ma35753	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M18-Ma35753	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-Ma35753	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M18-Ma35753	NCP	mg/L	0.04	0.06	32	30%	Fail	Q15
TRH >C10-C16	M18-Ma35360	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M18-Ma35360	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M18-Ma35360	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M18-Ma35360	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M18-Ma35360	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M18-Ma35360	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M18-Ma35360	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M18-Ma35360	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Ma35360	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-Ma35360	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Ma35360	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	M18-Ma35360	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	M18-Ma35360	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	M18-Ma35360	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M18-Ma35360	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ma35360	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	M18-Ma35360	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	M18-Ma35360	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	M18-Ma35360	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M18-Ma33099	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkane sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M18-Ma33099	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma33099	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma33099	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma33099	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma33099	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma33099	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma33099	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkane sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma33099	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Ap00308	NCP	mg/L	< 0.001	0.002	62	30%	Fail	Q15
Cadmium	M18-Ap00308	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	M18-Ap00308	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	M18-Ap00308	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead	M18-Ap00308	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	M18-Ap00308	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	M18-Ap00308	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	M18-Ap00308	NCP	mg/L	0.017	0.017	<1	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).
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

[redacted]

Analytical Services Manager
Senior Analyst-Metal (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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CHAIN OF CUSTODY & ANALYSIS REQUEST

Eurofins
3 Kingston Town Close, Oakleigh, VIC, 3166
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PROJECT #	PROJECT NAME
IS025200-550	Taxiway Zulu and Nothern Access Route

SAMPLE COLLECTOR'S NAME: [redacted]

LAB JOB #:

PRELIM. RESULTS BY: ☑ Email ☐ VERBAL ☐ FAX ☑ EMAIL

FINAL REPORT BY: Email

SEND TO EMAIL ADDRESS(ES): [redacted]

LAB QUOTE REF:

Jacobs ORDER No:

SAMPLE ID	DEPTH (metres)	LAB #	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATION METHOD: ICE	ACID	OTHER	NONE	SAMPLING DATE	No. OF CONTAINERS	METHOD CODE & ANALYSIS REQUIRED: R1: Vic EPA IWRG621 full screen	B7: TPH, BTEXN, PAH, Metals 8	R21: NEPM screen %Fe, CEC, pH (CaCl2), TOC, % clay content	Total 28 PFAS including PFOA/PFOS and 6:2 FTS	ASLP 28 PFAS including PFOA/PFOS and 6:2 FTS	HOLD			COMMENTS (see below) (1) (2) (3)
ZULU_R1_290318			X				X				29/3/18	5		X		X	X				
ZULU_QAQC1_290318				X			X					1				X	X				
ZULU_QAQC2_290318				X			X					1				X	X				→ Please forward to ALS
ZULU_SS010_0.6				X			X					2		X		X	X				
ZULU_SS010_0.92				X			X					2						X			
ZULU_SS011_0.4				X			X					2		X		X	X				
ZULU_SS012_0.4				X			X					2	X			X	X				
ZULU_SS013_0.3				X			X					2	X			X	X				
ZULU_SS014_0.4				X			X					3		X		X	X				Don't analyse zip lock bag
ZULU_SS015_0.4				X			X					2	X			X	X				→ Hold zip bag please
ZULU_SS016_0.4				X			X					2		X		X	X				
ZULU_SS017_0.4				X			X					2	X			X	X				
ZULU_SS030_0.32				X			X					2		X		X	X				
ZULU_SS031_0.29				X			X					2		X		X	X				
ZULU_SS031_0.8				X			X					2						X			
ZULU_SS032_0.4				X			X					2		X		X	X				
ZULU_SS020_0.4				X			X					2	X			X	X				
ZULU_SS021_0.26				X			X					2		X		X	X				low sample volume
ZULU_SS022_0.35				X			X					2	X			X	X				
ZULU_SS022_0.8				X			X					2						X			
SB3981				X			X					1						X			
SB3984				X			X					1						X			
TOTALS												44									

Relinquished by (SIGN/PRINT):	of	Date	Time	Received by (SIGN/PRINT):	of	Date	Time	Custody Seals Intact?	Sample Receipt Temp
[redacted]	Jacobs	29/3	4.00pm	[redacted]	MGT	29/3/18	6.35pm		591925

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Mar 31, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Mar 31, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Mar 31, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Apr 10, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
AUS Leaching Procedure	Brisbane	Apr 10, 2018	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			

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Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
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Order No.:
Report #: 591925
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Mar 29, 2018 6:35 PM
Due: Apr 10, 2018
Priority: 5 Day
Contact Name: [redacted]

Project Name: TAXIWAY ZULU AND NORTHERN ACCESS ROUTE
Project ID: IS025200-550

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X	X	X			X
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	ZULU_R1_290318	Mar 29, 2018		Water	M18-Ma36142					X		X
2	ZULU_QAQC11_290318	Mar 29, 2018		Soil	M18-Ma36143				X			X
3	ZULU_QAQC11_290318	Mar 29, 2018		AUS Leachate	M18-Ma36144		X					X
4	ZULU_SS010_0.6	Mar 29, 2018		Soil	M18-Ma36145			X		X		X
5	ZULU_SS011_0.4	Mar 29, 2018		Soil	M18-Ma36146			X		X		X
6	ZULU_SS012_	Mar 29, 2018		Soil	M18-Ma36147			X			X	X

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Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X	X	X			X
Perth Laboratory - NATA Site # 23736												
	0.4											
7	ZULU_SS013_0.3	Mar 29, 2018		Soil	M18-Ma36148			X			X	X
8	ZULU_SS014_0.4	Mar 29, 2018		Soil	M18-Ma36149			X		X		X
9	ZULU_SS015_0.4	Mar 29, 2018		Soil	M18-Ma36150			X			X	X
10	ZULU_SS016_0.4	Mar 29, 2018		Soil	M18-Ma36151			X		X		X
11	ZULU_SS017_0.4	Mar 29, 2018		Soil	M18-Ma36152			X			X	X
12	ZULU_SS030_0.32	Mar 29, 2018		Soil	M18-Ma36153			X		X		X
13	ZULU_SS031_	Mar 29, 2018		Soil	M18-Ma36154			X		X		X

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Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X	X	X			X
Perth Laboratory - NATA Site # 23736												
	0.29											
14	ZULU_SS032_0.4	Mar 29, 2018		Soil	M18-Ma36155			X		X		X
15	ZULU_SS020_0.4	Mar 29, 2018		Soil	M18-Ma36156			X			X	X
16	ZULU_SS021_0.26	Mar 29, 2018		Soil	M18-Ma36157			X		X		X
17	ZULU_SS022_0.35	Mar 29, 2018		Soil	M18-Ma36158			X			X	X
18	ZULU_SS010_0.6	Mar 29, 2018		AUS Leachate	M18-Ma36159		X					X
19	ZULU_SS011_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36160		X					X
20	ZULU_SS012_	Mar 29, 2018		AUS Leachate	M18-Ma36161		X					X

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Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X	X	X			X
Perth Laboratory - NATA Site # 23736												
	0.4											
21	ZULU_SS013_0.3	Mar 29, 2018		AUS Leachate	M18-Ma36162		X					X
22	ZULU_SS014_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36163		X					X
23	ZULU_SS015_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36164		X					X
24	ZULU_SS016_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36165		X					X
25	ZULU_SS017_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36166		X					X
26	ZULU_SS030_0.32	Mar 29, 2018		AUS Leachate	M18-Ma36167		X					X
27	ZULU_SS031_	Mar 29, 2018		AUS Leachate	M18-Ma36168		X					X

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Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X	X	X			X
Perth Laboratory - NATA Site # 23736												
	0.29											
28	ZULU_SS032_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36169		X					X
29	ZULU_SS020_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36170		X					X
30	ZULU_SS021_0.26	Mar 29, 2018		AUS Leachate	M18-Ma36171		X					X
31	ZULU_SS022_0.35	Mar 29, 2018		AUS Leachate	M18-Ma36172		X					X
32	ZULU_SS010_0.92	Mar 29, 2018		Soil	M18-Ma36173	X						
33	ZULU_SS031_0.8	Mar 29, 2018		Soil	M18-Ma36174	X						
34	ZULU_SS022_	Mar 29, 2018		Soil	M18-Ma36175	X						

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Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X	X	X			X
Perth Laboratory - NATA Site # 23736												
	0.8											
35	SB3981	Mar 29, 2018		Soil	M18-Ma36176	X						
36	SB3984	Mar 29, 2018		Soil	M18-Ma36177	X						
Test Counts						5	15	15	15	9	6	31

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

QC Data General Comments

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

Quality Control Results

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

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M18-Ma36160	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma36160	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma36160	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma36160	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma36160	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma36160	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma36160	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma36160	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma36160	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma36160	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma36160	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M18-Ma36160	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma36160	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma36160	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma36160	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma36160	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma36160	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma36160	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M18-Ma36160	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma36160	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma36160	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma36160	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma36160	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma36160	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma36160	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma36160	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma36160	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma36160	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M18-Ma36161	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma36161	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma36161	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma36161	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma36161	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma36161	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma36161	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma36161	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma36161	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma36161	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma36161	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M18-Ma36161	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma36161	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma36161	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma36161	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma36161	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma36161	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma36161	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M18-Ma36161	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma36161	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma36161	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma36161	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma36161	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma36161	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma36161	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma36161	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma36161	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma36161	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M18-Ma36172	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma36172	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma36172	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma36172	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma36172	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma36172	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma36172	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma36172	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma36172	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma36172	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma36172	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M18-Ma36172	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma36172	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma36172	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma36172	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma36172	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma36172	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma36172	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M18-Ma36172	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma36172	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma36172	CP	ug/L	0.01	0.01	2.0	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma36172	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma36172	CP	ug/L	0.05	0.05	1.0	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma36172	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma36172	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma36172	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma36172	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma36172	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

amended to V2: sample Id updated from ZULU_QAQC11_290318 to ZULU_QAQC1_290318

Sample Integrity

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

Qualifier Codes/Comments

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

Authorised By

[redacted]

Analytical Services Manager
Senior Analyst-Organic (QLD)

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 History

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

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

Description	Testing Site	Extracted	Holding Time
Vic EPA IWRG 621 (Solids)			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Apr 04, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C36			
Volatile Organics	Melbourne	Apr 04, 2018	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 04, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 04, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Apr 04, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Organochlorine Pesticides	Melbourne	Apr 04, 2018	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Melbourne	Apr 04, 2018	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Phenols (Halogenated)	Melbourne	Apr 04, 2018	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Melbourne	Apr 04, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Chromium (hexavalent)	Melbourne	Apr 04, 2018	28 Day
- Method: APHA 3500-Cr Hexavalent Chromium- (Extraction:- USEPA3060)			
Cyanide (total)	Melbourne	Apr 04, 2018	14 Day
- Method: LTM-INO-4020 Total Free WAD Cyanide by CFA			
Fluoride	Melbourne	Apr 05, 2018	28 Day
- Method: LTM-INO-4150 Determination of Total Fluoride PART A – CIC			
pH (1:5 Aqueous extract at 25°C as rec.)	Melbourne	Apr 05, 2018	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
Metals IWRG 621 : Metals M12	Melbourne	Apr 04, 2018	28 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
Eurofins | mgt Suite B7			
BTEX	Melbourne	Apr 04, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8	Melbourne	Apr 04, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Mar 31, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Mar 31, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Mar 31, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Apr 10, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
% Moisture	Melbourne	Mar 31, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

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Project Name: TAXIWAY ZULU AND NORTHERN ACCESS ROUTE
Project ID: IS025200-550

Order No.:
Report #: 591925
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Mar 29, 2018 6:35 PM
Due: Apr 10, 2018
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X	X	X			X
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	ZULU_R1_290318	Mar 29, 2018		Water	M18-Ma36142					X		X
2	ZULU_QAQC11_290318	Mar 29, 2018		Soil	M18-Ma36143				X			X
3	ZULU_QAQC11_290318	Mar 29, 2018		AUS Leachate	M18-Ma36144		X					X
4	ZULU_SS010_0.6	Mar 29, 2018		Soil	M18-Ma36145			X		X		X
5	ZULU_SS011_0.4	Mar 29, 2018		Soil	M18-Ma36146			X		X		X
6	ZULU_SS012_	Mar 29, 2018		Soil	M18-Ma36147			X			X	X

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Contact Name: [redacted]

Project Name: TAXIWAY ZULU AND NORTHERN ACCESS ROUTE
Project ID: IS025200-550

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X	X	X			X
Perth Laboratory - NATA Site # 23736												
	0.4											
7	ZULU_SS013_0.3	Mar 29, 2018		Soil	M18-Ma36148			X			X	X
8	ZULU_SS014_0.4	Mar 29, 2018		Soil	M18-Ma36149			X		X		X
9	ZULU_SS015_0.4	Mar 29, 2018		Soil	M18-Ma36150			X			X	X
10	ZULU_SS016_0.4	Mar 29, 2018		Soil	M18-Ma36151			X		X		X
11	ZULU_SS017_0.4	Mar 29, 2018		Soil	M18-Ma36152			X			X	X
12	ZULU_SS030_0.32	Mar 29, 2018		Soil	M18-Ma36153			X		X		X
13	ZULU_SS031_	Mar 29, 2018		Soil	M18-Ma36154			X		X		X

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Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Project Name: TAXIWAY ZULU AND NORTHERN ACCESS ROUTE
Project ID: IS025200-550

Order No.:
Report #: 591925
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Mar 29, 2018 6:35 PM
Due: Apr 10, 2018
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X	X	X			X
Perth Laboratory - NATA Site # 23736												
	0.29											
14	ZULU_SS032_0.4	Mar 29, 2018		Soil	M18-Ma36155			X		X		X
15	ZULU_SS020_0.4	Mar 29, 2018		Soil	M18-Ma36156			X			X	X
16	ZULU_SS021_0.26	Mar 29, 2018		Soil	M18-Ma36157			X		X		X
17	ZULU_SS022_0.35	Mar 29, 2018		Soil	M18-Ma36158			X			X	X
18	ZULU_SS010_0.6	Mar 29, 2018		AUS Leachate	M18-Ma36159		X					X
19	ZULU_SS011_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36160		X					X
20	ZULU_SS012_	Mar 29, 2018		AUS Leachate	M18-Ma36161		X					X

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Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X	X	X			X
Perth Laboratory - NATA Site # 23736												
	0.4											
21	ZULU_SS013_0.3	Mar 29, 2018		AUS Leachate	M18-Ma36162		X					X
22	ZULU_SS014_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36163		X					X
23	ZULU_SS015_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36164		X					X
24	ZULU_SS016_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36165		X					X
25	ZULU_SS017_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36166		X					X
26	ZULU_SS030_0.32	Mar 29, 2018		AUS Leachate	M18-Ma36167		X					X
27	ZULU_SS031_	Mar 29, 2018		AUS Leachate	M18-Ma36168		X					X

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Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X	X	X			X
Perth Laboratory - NATA Site # 23736												
	0.29											
28	ZULU_SS032_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36169		X					X
29	ZULU_SS020_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36170		X					X
30	ZULU_SS021_0.26	Mar 29, 2018		AUS Leachate	M18-Ma36171		X					X
31	ZULU_SS022_0.35	Mar 29, 2018		AUS Leachate	M18-Ma36172		X					X
32	ZULU_SS010_0.92	Mar 29, 2018		Soil	M18-Ma36173	X						
33	ZULU_SS031_0.8	Mar 29, 2018		Soil	M18-Ma36174	X						
34	ZULU_SS022_	Mar 29, 2018		Soil	M18-Ma36175	X						

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Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X	X	X			X
Perth Laboratory - NATA Site # 23736												
	0.8											
35	SB3981	Mar 29, 2018		Soil	M18-Ma36176	X						
36	SB3984	Mar 29, 2018		Soil	M18-Ma36177	X						
Test Counts						5	15	15	15	9	6	31

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
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							
Volatile Organics							
1.1-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.2.4-Trichlorobenzene	mg/kg	< 0.5			0.5	Pass	
Hexachlorobutadiene	mg/kg	< 0.5			0.5	Pass	
1.1-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dibromoethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.4-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.3.5-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
2-Butanone (MEK)	mg/kg	< 0.5			0.5	Pass	
2-Propanone (Acetone)	mg/kg	< 0.5			0.5	Pass	
4-Chlorotoluene	mg/kg	< 0.5			0.5	Pass	
4-Methyl-2-pentanone (MIBK)	mg/kg	< 0.5			0.5	Pass	
Allyl chloride	mg/kg	< 0.5			0.5	Pass	
Bromobenzene	mg/kg	< 0.5			0.5	Pass	
Bromochloromethane	mg/kg	< 0.5			0.5	Pass	
Bromodichloromethane	mg/kg	< 0.5			0.5	Pass	
Bromoform	mg/kg	< 0.5			0.5	Pass	
Bromomethane	mg/kg	< 0.5			0.5	Pass	
Carbon disulfide	mg/kg	< 0.5			0.5	Pass	
Carbon Tetrachloride	mg/kg	< 0.5			0.5	Pass	
Chlorobenzene	mg/kg	< 0.5			0.5	Pass	
Chloroethane	mg/kg	< 0.5			0.5	Pass	
Chloroform	mg/kg	< 0.5			0.5	Pass	
Chloromethane	mg/kg	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
cis-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	

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

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

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
Method Blank							
Chromium (hexavalent)	mg/kg	< 1			1	Pass	
Cyanide (total)	mg/kg	< 5			5	Pass	
Fluoride	mg/kg	< 100			100	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Molybdenum	mg/kg	< 5			5	Pass	
Nickel	mg/kg	< 5			5	Pass	
Selenium	mg/kg	< 2			2	Pass	
Silver	mg/kg	< 0.2			0.2	Pass	
Tin	mg/kg	< 10			10	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	128			70-130	Pass	
TRH C10-C14	%	75			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	93			70-130	Pass	
Toluene	%	101			70-130	Pass	
Ethylbenzene	%	110			70-130	Pass	
m&p-Xylenes	%	114			70-130	Pass	
Xylenes - Total	%	112			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	77			70-130	Pass	
1.1.1-Trichloroethane	%	106			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1.2-Dichlorobenzene	%	109			70-130	Pass	
1.2-Dichloroethane	%	118			70-130	Pass	
Trichloroethene	%	99			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	109			70-130	Pass	
TRH C6-C10	%	127			70-130	Pass	
TRH >C10-C16	%	75			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	78			70-130	Pass	
Acenaphthylene	%	70			70-130	Pass	
Anthracene	%	71			70-130	Pass	
Benz(a)anthracene	%	75			70-130	Pass	
Benzo(a)pyrene	%	71			70-130	Pass	
Benzo(b&j)fluoranthene	%	78			70-130	Pass	
Benzo(g.h.i)perylene	%	83			70-130	Pass	
Benzo(k)fluoranthene	%	74			70-130	Pass	
Chrysene	%	75			70-130	Pass	
Dibenz(a.h)anthracene	%	73			70-130	Pass	
Fluoranthene	%	80			70-130	Pass	
Fluorene	%	70			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	90			70-130	Pass	
Naphthalene	%	72			70-130	Pass	
Phenanthrene	%	78			70-130	Pass	
Pyrene	%	77			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	122			70-130	Pass	
4.4'-DDE	%	117			70-130	Pass	
4.4'-DDT	%	70			70-130	Pass	
a-BHC	%	108			70-130	Pass	
Aldrin	%	112			70-130	Pass	
b-BHC	%	101			70-130	Pass	
d-BHC	%	108			70-130	Pass	
Dieldrin	%	111			70-130	Pass	
Endosulfan I	%	113			70-130	Pass	
Endosulfan II	%	110			70-130	Pass	
Endosulfan sulphate	%	111			70-130	Pass	
Endrin	%	107			70-130	Pass	
Endrin aldehyde	%	103			70-130	Pass	
Endrin ketone	%	107			70-130	Pass	
g-BHC (Lindane)	%	103			70-130	Pass	
Heptachlor	%	103			70-130	Pass	
Heptachlor epoxide	%	110			70-130	Pass	
Hexachlorobenzene	%	106			70-130	Pass	
Methoxychlor	%	75			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	77			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	79			30-130	Pass	
2.4-Dichlorophenol	%	86			30-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.4.5-Trichlorophenol	%	117			30-130	Pass	
2.4.6-Trichlorophenol	%	118			30-130	Pass	
2.6-Dichlorophenol	%	102			30-130	Pass	
4-Chloro-3-methylphenol	%	123			30-130	Pass	
Pentachlorophenol	%	81			30-130	Pass	
Tetrachlorophenols - Total	%	120			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	73			30-130	Pass	
2-Methyl-4.6-dinitrophenol	%	48			30-130	Pass	
2-Methylphenol (o-Cresol)	%	89			30-130	Pass	
2-Nitrophenol	%	65			30-130	Pass	
2.4-Dimethylphenol	%	87			30-130	Pass	
2.4-Dinitrophenol	%	46			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	85			30-130	Pass	
4-Nitrophenol	%	105			30-130	Pass	
Dinoseb	%	51			30-130	Pass	
Phenol	%	106			30-130	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	101			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	97			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	117			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	95			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	106			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	93			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	84			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	87			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	97			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	87			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	95			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	83			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	93			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	104			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	98			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	108			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	108			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	103			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	88			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	110			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	88			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	94			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	94			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	103			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	95			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	108			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	85			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	124			50-150	Pass	
LCS - % Recovery							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chromium (hexavalent)	%	98			70-130	Pass	
Cyanide (total)	%	92			70-130	Pass	
Fluoride	%	109			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	108			80-120	Pass	
Cadmium	%	109			80-120	Pass	
Chromium	%	115			80-120	Pass	
Copper	%	110			80-120	Pass	
Lead	%	120			80-120	Pass	
Mercury	%	103			75-125	Pass	
Molybdenum	%	109			80-120	Pass	
Nickel	%	110			80-120	Pass	
Selenium	%	104			80-120	Pass	
Silver	%	115			80-120	Pass	
Tin	%	110			80-120	Pass	
Zinc	%	107			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-Ap02726	NCP	%	78			70-130	Pass	
Acenaphthylene	M18-Ap02726	NCP	%	73			70-130	Pass	
Anthracene	M18-Ap02726	NCP	%	84			70-130	Pass	
Benz(a)anthracene	M18-Ap02726	NCP	%	78			70-130	Pass	
Benzo(a)pyrene	M18-Ap02726	NCP	%	73			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Ap02726	NCP	%	78			70-130	Pass	
Benzo(g.h.i)perylene	M18-Ap02726	NCP	%	78			70-130	Pass	
Benzo(k)fluoranthene	M18-Ap02726	NCP	%	84			70-130	Pass	
Chrysene	M18-Ap02726	NCP	%	72			70-130	Pass	
Dibenz(a.h)anthracene	M18-Ap02726	NCP	%	75			70-130	Pass	
Fluoranthene	M18-Ap02726	NCP	%	74			70-130	Pass	
Fluorene	M18-Ap02726	NCP	%	71			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ap02726	NCP	%	90			70-130	Pass	
Naphthalene	M18-Ap02726	NCP	%	74			70-130	Pass	
Phenanthrene	M18-Ap02726	NCP	%	76			70-130	Pass	
Pyrene	M18-Ap02726	NCP	%	72			70-130	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M18-Ma36145	CP	%	102			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma36145	CP	%	98			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma36145	CP	%	118			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma36145	CP	%	91			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma36145	CP	%	107			50-150	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma36145	CP	%	93			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma36145	CP	%	83			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma36145	CP	%	86			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma36145	CP	%	94			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma36145	CP	%	89			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma36145	CP	%	97			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctane sulfonamide (FOSA)	M18-Ma36145	CP	%	78			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma36145	CP	%	84			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma36145	CP	%	97			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma36145	CP	%	105			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma36145	CP	%	100			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma36145	CP	%	110			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma36145	CP	%	107			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M18-Ma36145	CP	%	89			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma36145	CP	%	108			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma36145	CP	%	89			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma36145	CP	%	96			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma36145	CP	%	94			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma36145	CP	%	103			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma36145	CP	%	95			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma36145	CP	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma36145	CP	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma36145	CP	%	117			50-150	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M18-Ma36146	CP	%	106			70-130	Pass	
TRH C10-C14	M18-Ma36146	CP	%	83			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-Ma36146	CP	%	82			70-130	Pass	
Toluene	M18-Ma36146	CP	%	89			70-130	Pass	
Ethylbenzene	M18-Ma36146	CP	%	94			70-130	Pass	
m&p-Xylenes	M18-Ma36146	CP	%	98			70-130	Pass	
o-Xylene	M18-Ma36146	CP	%	97			70-130	Pass	
Xylenes - Total	M18-Ma36146	CP	%	97			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-Ma36146	CP	%	103			70-130	Pass	
TRH C6-C10	M18-Ma36146	CP	%	104			70-130	Pass	
TRH >C10-C16	M18-Ma36146	CP	%	86			70-130	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Heavy Metals				Result 1					
Arsenic	M18-Ma36146	CP	%	95			75-125	Pass	
Cadmium	M18-Ma36146	CP	%	106			75-125	Pass	
Chromium	M18-Ma36146	CP	%	108			75-125	Pass	
Copper	M18-Ma36146	CP	%	106			75-125	Pass	
Lead	M18-Ma36146	CP	%	116			75-125	Pass	
Mercury	M18-Ma36146	CP	%	97			70-130	Pass	
Molybdenum	M18-Ma36146	CP	%	106			75-125	Pass	
Nickel	M18-Ma36146	CP	%	107			75-125	Pass	
Selenium	M18-Ma36146	CP	%	90			75-125	Pass	
Silver	M18-Ma36146	CP	%	107			75-125	Pass	
Tin	M18-Ma36146	CP	%	110			75-125	Pass	
Zinc	M18-Ma36146	CP	%	112			75-125	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
1.1-Dichloroethene	S18-Ap03105	NCP	%	73			70-130	Pass	
1.1.1-Trichloroethane	S18-Ap03105	NCP	%	84			70-130	Pass	
1.2-Dichlorobenzene	S18-Ap03105	NCP	%	99			70-130	Pass	
1.2-Dichloroethane	S18-Ap03105	NCP	%	113			70-130	Pass	
Trichloroethene	S18-Ap03105	NCP	%	91			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDT	M18-Ma36218	NCP	%	81			70-130	Pass	
Methoxychlor	M18-Ma36218	NCP	%	104			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	M18-Ap02384	NCP	%	99			30-130	Pass	
2.4-Dichlorophenol	M18-Ap02384	NCP	%	75			30-130	Pass	
2.4.5-Trichlorophenol	M18-Ap02384	NCP	%	51			30-130	Pass	
2.4.6-Trichlorophenol	M18-Ap02384	NCP	%	38			30-130	Pass	
2.6-Dichlorophenol	M18-Ap02384	NCP	%	36			30-130	Pass	
4-Chloro-3-methylphenol	M18-Ap02384	NCP	%	108			30-130	Pass	
Pentachlorophenol	M18-Ap01504	NCP	%	80			30-130	Pass	
Tetrachlorophenols - Total	M18-Ap02374	NCP	%	37			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	M18-Ap02384	NCP	%	73			30-130	Pass	
2-Methyl-4.6-dinitrophenol	M18-Ap02374	NCP	%	43			30-130	Pass	
2-Methylphenol (o-Cresol)	M18-Ap02384	NCP	%	106			30-130	Pass	
2-Nitrophenol	M18-Ap02374	NCP	%	105			30-130	Pass	
2.4-Dimethylphenol	M18-Ap02384	NCP	%	115			30-130	Pass	
2.4-Dinitrophenol	M18-Ap02384	NCP	%	32			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M18-Ap02384	NCP	%	101			30-130	Pass	
4-Nitrophenol	M18-Ap02384	NCP	%	56			30-130	Pass	
Dinoseb	M18-Ap02384	NCP	%	66			30-130	Pass	
Phenol	M18-Ap02384	NCP	%	90			30-130	Pass	
Spike - % Recovery									
				Result 1					
Fluoride	M18-Ap03234	NCP	%	78			70-130	Pass	
Spike - % Recovery									
				Result 1					
Chromium (hexavalent)	M18-Ma36148	CP	%	110			70-130	Pass	
Cyanide (total)	M18-Ma36148	CP	%	62			70-130	Fail	Q08
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Organochlorine Pesticides				Result 1					
4.4'-DDD	M18-Ma36150	CP	%	116			70-130	Pass	
4.4'-DDE	M18-Ma36150	CP	%	102			70-130	Pass	
a-BHC	M18-Ma36150	CP	%	85			70-130	Pass	
Aldrin	M18-Ma36150	CP	%	89			70-130	Pass	
b-BHC	M18-Ma36150	CP	%	82			70-130	Pass	
d-BHC	M18-Ma36150	CP	%	91			70-130	Pass	
Dieldrin	M18-Ma36150	CP	%	95			70-130	Pass	
Endosulfan I	M18-Ma36150	CP	%	95			70-130	Pass	
Endosulfan II	M18-Ma36150	CP	%	98			70-130	Pass	
Endosulfan sulphate	M18-Ma36150	CP	%	103			70-130	Pass	
Endrin	M18-Ma36150	CP	%	98			70-130	Pass	
Endrin aldehyde	M18-Ma36150	CP	%	93			70-130	Pass	
Endrin ketone	M18-Ma36150	CP	%	96			70-130	Pass	
g-BHC (Lindane)	M18-Ma36150	CP	%	85			70-130	Pass	
Heptachlor	M18-Ma36150	CP	%	78			70-130	Pass	
Heptachlor epoxide	M18-Ma36150	CP	%	92			70-130	Pass	
Hexachlorobenzene	M18-Ma36150	CP	%	83			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	M18-Ma36150	CP	%	101			70-130	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M18-Ma36155	CP	%	105			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma36155	CP	%	125			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma36155	CP	%	123			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma36155	CP	%	87			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma36155	CP	%	105			50-150	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma36155	CP	%	94			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma36155	CP	%	87			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma36155	CP	%	89			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma36155	CP	%	97			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma36155	CP	%	102			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma36155	CP	%	104			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M18-Ma36155	CP	%	82			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma36155	CP	%	84			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma36155	CP	%	121			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma36155	CP	%	107			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma36155	CP	%	112			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma36155	CP	%	107			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma36155	CP	%	115			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorobutanesulfonic acid (PFBS)	M18-Ma36155	CP	%	93			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma36155	CP	%	109			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma36155	CP	%	88			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma36155	CP	%	95			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma36155	CP	%	98			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma36155	CP	%	106			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma36155	CP	%	98			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma36155	CP	%	98			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma36155	CP	%	109			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma36155	CP	%	139			50-150	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M18-Ma36156	CP	%	85			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M18-Ma36156	CP	%	85			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Ma36156	CP	%	95			75-125	Pass	
Cadmium	M18-Ma36156	CP	%	108			75-125	Pass	
Chromium	M18-Ma36156	CP	%	122			75-125	Pass	
Copper	M18-Ma36156	CP	%	112			75-125	Pass	
Lead	M18-Ma36156	CP	%	132			75-125	Fail	Q08
Mercury	M18-Ma36156	CP	%	109			70-130	Pass	
Molybdenum	M18-Ma36156	CP	%	108			75-125	Pass	
Nickel	M18-Ma36156	CP	%	118			75-125	Pass	
Selenium	M18-Ma36156	CP	%	89			75-125	Pass	
Silver	M18-Ma36156	CP	%	108			75-125	Pass	
Tin	M18-Ma36156	CP	%	111			75-125	Pass	
Zinc	M18-Ma36156	CP	%	118			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma36143	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma36143	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma36143	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma36143	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-Ma36143	CP	%	20	20	4.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M18-Ma36145	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M18-Ma36145	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M18-Ma36145	CP	mg/kg	< 50	< 50	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M18-Ma36145	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M18-Ma36145	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M18-Ma36145	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-Ma36145	CP	%	15	15	1.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Ma36145	CP	mg/kg	2.1	2.1	2.0	30%	Pass	
Cadmium	M18-Ma36145	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Ma36145	CP	mg/kg	66	58	12	30%	Pass	
Copper	M18-Ma36145	CP	mg/kg	15	13	11	30%	Pass	
Lead	M18-Ma36145	CP	mg/kg	14	12	14	30%	Pass	
Mercury	M18-Ma36145	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M18-Ma36145	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M18-Ma36145	CP	mg/kg	57	51	12	30%	Pass	
Selenium	M18-Ma36145	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M18-Ma36145	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M18-Ma36145	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M18-Ma36145	CP	mg/kg	22	19	12	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Ma36146	CP	mg/kg	2.0	2.1	4.0	30%	Pass	
Cadmium	M18-Ma36146	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Ma36146	CP	mg/kg	40	40	1.0	30%	Pass	
Copper	M18-Ma36146	CP	mg/kg	15	15	1.0	30%	Pass	
Lead	M18-Ma36146	CP	mg/kg	17	17	1.0	30%	Pass	
Mercury	M18-Ma36146	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M18-Ma36146	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M18-Ma36146	CP	mg/kg	37	38	1.0	30%	Pass	
Selenium	M18-Ma36146	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M18-Ma36146	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M18-Ma36146	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M18-Ma36146	CP	mg/kg	43	44	1.0	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4-Trichlorobenzene	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Hexachlorobutadiene	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1-Dichloroethene	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1-Trichloroethane	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2-Trichloroethane	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dibromoethane	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichlorobenzene	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloroethane	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloropropane	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.3-Trichloropropane	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4-Trimethylbenzene	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichlorobenzene	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichloropropane	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3.5-Trimethylbenzene	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.4-Dichlorobenzene	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
2-Butanone (MEK)	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Propanone (Acetone)	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chlorotoluene	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Allyl chloride	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromobenzene	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromochloromethane	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromodichloromethane	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromoform	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromomethane	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon disulfide	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon Tetrachloride	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chlorobenzene	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroethane	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroform	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloromethane	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.2-Dichloroethene	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.3-Dichloropropene	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromochloromethane	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromomethane	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorodifluoromethane	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Iodomethane	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Isopropyl benzene (Cumene)	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Methylene Chloride	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Styrene	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Tetrachloroethene	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.2-Dichloroethene	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.3-Dichloropropene	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichloroethene	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichlorofluoromethane	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Vinyl chloride	S18-Ap02926	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M18-Ap02383	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	M18-Ap02383	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	M18-Ap02383	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	M18-Ap02383	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	M18-Ap02383	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	M18-Ap02383	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	M18-Ap02383	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	M18-Ap02383	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M18-Ap02383	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M18-Ap02383	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M18-Ap02383	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	M18-Ap02383	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	M18-Ap02383	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	M18-Ap02383	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M18-Ap02383	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	M18-Ap02383	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	M18-Ap02383	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	M18-Ap02383	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	M18-Ma36147	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Cyanide (total)	M18-Ma36147	CP	mg/kg	< 5	< 5	<1	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	M18-Ma36147	CP	pH Units	6.8	7.0	pass	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M18-Ma36148	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M18-Ma36148	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M18-Ma36148	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M18-Ma36148	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M18-Ma36148	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M18-Ma36148	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M18-Ma36148	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M18-Ma36148	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M18-Ma36148	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M18-Ma36148	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M18-Ma36148	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M18-Ma36148	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M18-Ma36148	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M18-Ma36148	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M18-Ma36148	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M18-Ma36148	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M18-Ma36148	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M18-Ma36148	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M18-Ma36148	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M18-Ma36148	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M18-Ma36148	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M18-Ma36148	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	M18-Ma36148	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	M18-Ma36148	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	M18-Ma36148	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	M18-Ma36148	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	M18-Ma36148	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	M18-Ma36148	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	M18-Ma36148	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Fluoride	M18-Ma36152	CP	mg/kg	100	130	20	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma36154	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma36154	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma36154	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma36154	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M18-Ma36155	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M18-Ma36155	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M18-Ma36155	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M18-Ma36155	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-Ma36155	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M18-Ma36155	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M18-Ma36155	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M18-Ma36155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M18-Ma36155	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M18-Ma36155	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-Ma36155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M18-Ma36155	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M18-Ma36155	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M18-Ma36155	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M18-Ma36155	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M18-Ma36155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M18-Ma36155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M18-Ma36155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M18-Ma36155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M18-Ma36155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Ma36155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-Ma36155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Ma36155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M18-Ma36155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M18-Ma36155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M18-Ma36155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M18-Ma36155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ma36155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M18-Ma36155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M18-Ma36155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M18-Ma36155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-Ma36155	CP	%	14	14	3.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Ma36155	CP	mg/kg	2.5	2.4	5.0	30%	Pass	
Cadmium	M18-Ma36155	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Ma36155	CP	mg/kg	53	49	9.0	30%	Pass	
Copper	M18-Ma36155	CP	mg/kg	12	14	10	30%	Pass	
Lead	M18-Ma36155	CP	mg/kg	12	12	1.0	30%	Pass	
Mercury	M18-Ma36155	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M18-Ma36155	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M18-Ma36155	CP	mg/kg	50	48	3.0	30%	Pass	
Selenium	M18-Ma36155	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M18-Ma36155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M18-Ma36155	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M18-Ma36155	CP	mg/kg	18	16	10	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Ma36156	CP	mg/kg	2.3	2.3	1.0	30%	Pass	
Cadmium	M18-Ma36156	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Ma36156	CP	mg/kg	42	44	4.0	30%	Pass	
Copper	M18-Ma36156	CP	mg/kg	15	15	2.0	30%	Pass	
Lead	M18-Ma36156	CP	mg/kg	43	43	2.0	30%	Pass	
Mercury	M18-Ma36156	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M18-Ma36156	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M18-Ma36156	CP	mg/kg	39	40	3.0	30%	Pass	
Selenium	M18-Ma36156	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M18-Ma36156	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M18-Ma36156	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M18-Ma36156	CP	mg/kg	42	43	1.0	30%	Pass	

Comments

amended to V2: sample Id updated from ZULU_QAQC11_290318 to ZULU_QAQC1_290318

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference

Authorised By

[redacted]

Analytical Services Manager
Senior Analyst-Metal (VIC)
Senior Analyst-Volatile (VIC)
Senior Analyst-Organic (QLD)
Senior Analyst-Organic (VIC)
Senior Analyst-Inorganic (VIC)
Senior Analyst-Metal (QLD)

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 History

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

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

Description	Testing Site	Extracted	Holding Time
Vic EPA IWRG 621 (Solids)			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Apr 09, 2018	7 Day
- Method: LTM-ORG-2010 TRH C6-C36			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 03, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 09, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Apr 09, 2018	7 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Eurofins | mgt Suite B7			
BTEX	Melbourne	Apr 03, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8	Melbourne	Apr 03, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Per- and Polyfluorinated Alkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Apr 08, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
Perfluoroalkane sulfonamido substances	Brisbane	Apr 08, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
Perfluoroalkane sulfonic acids (PFSAs)	Brisbane	Apr 08, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Apr 08, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoro Alkyl Substances (PFAS)			

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Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Project Name: TAXIWAY ZULU AND NORTHERN ACCESS ROUTE
Project ID: IS025200-550

Order No.:
Report #: 591925
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Mar 29, 2018 6:35 PM
Due: Apr 10, 2018
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X	X	X			X
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	ZULU_R1_290318	Mar 29, 2018		Water	M18-Ma36142					X		X
2	ZULU_QAQC11_290318	Mar 29, 2018		Soil	M18-Ma36143				X			X
3	ZULU_QAQC11_290318	Mar 29, 2018		AUS Leachate	M18-Ma36144		X					X
4	ZULU_SS010_0.6	Mar 29, 2018		Soil	M18-Ma36145			X		X		X
5	ZULU_SS011_0.4	Mar 29, 2018		Soil	M18-Ma36146			X		X		X
6	ZULU_SS012_	Mar 29, 2018		Soil	M18-Ma36147			X			X	X

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Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X	X	X			X
Perth Laboratory - NATA Site # 23736												
	0.4											
7	ZULU_SS013_0.3	Mar 29, 2018		Soil	M18-Ma36148			X			X	X
8	ZULU_SS014_0.4	Mar 29, 2018		Soil	M18-Ma36149			X		X		X
9	ZULU_SS015_0.4	Mar 29, 2018		Soil	M18-Ma36150			X			X	X
10	ZULU_SS016_0.4	Mar 29, 2018		Soil	M18-Ma36151			X		X		X
11	ZULU_SS017_0.4	Mar 29, 2018		Soil	M18-Ma36152			X			X	X
12	ZULU_SS030_0.32	Mar 29, 2018		Soil	M18-Ma36153			X		X		X
13	ZULU_SS031_	Mar 29, 2018		Soil	M18-Ma36154			X		X		X

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Due: Apr 10, 2018
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X	X	X			X
Perth Laboratory - NATA Site # 23736												
	0.29											
14	ZULU_SS032_0.4	Mar 29, 2018		Soil	M18-Ma36155			X		X		X
15	ZULU_SS020_0.4	Mar 29, 2018		Soil	M18-Ma36156			X			X	X
16	ZULU_SS021_0.26	Mar 29, 2018		Soil	M18-Ma36157			X		X		X
17	ZULU_SS022_0.35	Mar 29, 2018		Soil	M18-Ma36158			X			X	X
18	ZULU_SS010_0.6	Mar 29, 2018		AUS Leachate	M18-Ma36159		X					X
19	ZULU_SS011_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36160		X					X
20	ZULU_SS012_	Mar 29, 2018		AUS Leachate	M18-Ma36161		X					X

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Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Order No.:
Report #: 591925
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Mar 29, 2018 6:35 PM
Due: Apr 10, 2018
Priority: 5 Day
Contact Name: [redacted]

Project Name: TAXIWAY ZULU AND NORTHERN ACCESS ROUTE
Project ID: IS025200-550

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X	X	X			X
Perth Laboratory - NATA Site # 23736												
	0.4											
21	ZULU_SS013_0.3	Mar 29, 2018		AUS Leachate	M18-Ma36162		X					X
22	ZULU_SS014_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36163		X					X
23	ZULU_SS015_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36164		X					X
24	ZULU_SS016_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36165		X					X
25	ZULU_SS017_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36166		X					X
26	ZULU_SS030_0.32	Mar 29, 2018		AUS Leachate	M18-Ma36167		X					X
27	ZULU_SS031_	Mar 29, 2018		AUS Leachate	M18-Ma36168		X					X

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Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X	X	X			X
Perth Laboratory - NATA Site # 23736												
	0.29											
28	ZULU_SS032_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36169		X					X
29	ZULU_SS020_0.4	Mar 29, 2018		AUS Leachate	M18-Ma36170		X					X
30	ZULU_SS021_0.26	Mar 29, 2018		AUS Leachate	M18-Ma36171		X					X
31	ZULU_SS022_0.35	Mar 29, 2018		AUS Leachate	M18-Ma36172		X					X
32	ZULU_SS010_0.92	Mar 29, 2018		Soil	M18-Ma36173	X						
33	ZULU_SS031_0.8	Mar 29, 2018		Soil	M18-Ma36174	X						
34	ZULU_SS022_	Mar 29, 2018		Soil	M18-Ma36175	X						

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Sample Detail						HOLD	AUS Leaching Procedure	Moisture Set	Moisture Set	Eurofins | mgt Suite B7	Vic EPA IWRG 621 (Solids)	Per- and Polyfluorinated Alkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X	X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794							X	X	X			X
Perth Laboratory - NATA Site # 23736												
	0.8											
35	SB3981	Mar 29, 2018		Soil	M18-Ma36176	X						
36	SB3984	Mar 29, 2018		Soil	M18-Ma36177	X						
Test Counts						5	15	15	15	9	6	31

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
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							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkane sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkane sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	93			70-130	Pass	
TRH C10-C14	%	77			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	88			70-130	Pass	
Toluene	%	82			70-130	Pass	
Ethylbenzene	%	86			70-130	Pass	
m&p-Xylenes	%	97			70-130	Pass	
Xylenes - Total	%	95			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	78			70-130	Pass	
TRH C6-C10	%	97			70-130	Pass	
TRH >C10-C16	%	76			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	115			70-130	Pass	
Acenaphthylene	%	122			70-130	Pass	
Anthracene	%	108			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benz(a)anthracene	%	114			70-130	Pass	
Benzo(a)pyrene	%	114			70-130	Pass	
Benzo(b&j)fluoranthene	%	118			70-130	Pass	
Benzo(g.h.i)perylene	%	108			70-130	Pass	
Benzo(k)fluoranthene	%	101			70-130	Pass	
Chrysene	%	127			70-130	Pass	
Dibenz(a.h)anthracene	%	117			70-130	Pass	
Fluoranthene	%	121			70-130	Pass	
Fluorene	%	124			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	108			70-130	Pass	
Naphthalene	%	114			70-130	Pass	
Phenanthrene	%	125			70-130	Pass	
Pyrene	%	110			70-130	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	100			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	104			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	118			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	104			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	106			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	110			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	104			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	104			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	118			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	104			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	98			50-150	Pass	
LCS - % Recovery							
Perfluoroalkane sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	106			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	76			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	72			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	112			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	98			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	96			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	110			50-150	Pass	
LCS - % Recovery							
Perfluoroalkane sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	100			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	98			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	110			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	110			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	102			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	108			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	108			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	94			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	102			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	62			50-150	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	110			80-120	Pass	
Cadmium	%	98			80-120	Pass	
Chromium	%	97			80-120	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Copper			%	103			80-120	Pass	
Lead			%	106			80-120	Pass	
Mercury			%	86			75-125	Pass	
Nickel			%	104			80-120	Pass	
Zinc			%	105			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M18-Ma35756	NCP	%	88			70-130	Pass	
TRH C10-C14	M18-Ap06035	NCP	%	90			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-Ma35756	NCP	%	86			70-130	Pass	
Toluene	M18-Ma35756	NCP	%	83			70-130	Pass	
Ethylbenzene	M18-Ma35756	NCP	%	83			70-130	Pass	
m&p-Xylenes	M18-Ma35756	NCP	%	96			70-130	Pass	
o-Xylene	M18-Ma35756	NCP	%	89			70-130	Pass	
Xylenes - Total	M18-Ma35756	NCP	%	94			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-Ma35756	NCP	%	78			70-130	Pass	
TRH C6-C10	M18-Ma35756	NCP	%	91			70-130	Pass	
TRH >C10-C16	M18-Ap06035	NCP	%	89			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-Ma33922	NCP	%	75			70-130	Pass	
Acenaphthylene	M18-Ma33922	NCP	%	84			70-130	Pass	
Anthracene	M18-Ma33922	NCP	%	88			70-130	Pass	
Benz(a)anthracene	M18-Ma33922	NCP	%	101			70-130	Pass	
Benzo(a)pyrene	M18-Ma33922	NCP	%	82			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Ma33922	NCP	%	96			70-130	Pass	
Benzo(g.h.i)perylene	M18-Ma33922	NCP	%	96			70-130	Pass	
Benzo(k)fluoranthene	M18-Ma33922	NCP	%	86			70-130	Pass	
Chrysene	M18-Ma33922	NCP	%	102			70-130	Pass	
Dibenz(a.h)anthracene	M18-Ma33922	NCP	%	93			70-130	Pass	
Fluoranthene	M18-Ma33922	NCP	%	110			70-130	Pass	
Fluorene	M18-Ma33922	NCP	%	87			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ma33922	NCP	%	96			70-130	Pass	
Naphthalene	M18-Ma33922	NCP	%	77			70-130	Pass	
Phenanthrene	M18-Ma33922	NCP	%	83			70-130	Pass	
Pyrene	M18-Ma33922	NCP	%	104			70-130	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M18-Ma35360	NCP	%	97			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma35360	NCP	%	110			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma35360	NCP	%	118			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma35360	NCP	%	102			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma35360	NCP	%	106			50-150	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma35360	NCP	%	109			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma35360	NCP	%	94			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma35360	NCP	%	87			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma35360	NCP	%	89			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorotridecanoic acid (PFTrDA)	M18-Ma35360	NCP	%	68			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma35360	NCP	%	79			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M18-Ma35360	NCP	%	100			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma35360	NCP	%	81			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma35360	NCP	%	76			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma35360	NCP	%	103			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma35360	NCP	%	79			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma35360	NCP	%	82			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma35360	NCP	%	102			50-150	Pass	
Spike - % Recovery									
Perfluoroalkane sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M18-Ma35360	NCP	%	101			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma35360	NCP	%	97			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma35360	NCP	%	106			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma35360	NCP	%	106			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma35360	NCP	%	96			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma35360	NCP	%	74			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma35360	NCP	%	109			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma35360	NCP	%	105			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma35360	NCP	%	115			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma35360	NCP	%	56			50-150	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	B18-Ma32960	NCP	%	103			75-125	Pass	
Cadmium	B18-Ma32960	NCP	%	95			75-125	Pass	
Chromium	B18-Ma32960	NCP	%	107			75-125	Pass	
Copper	B18-Ma32960	NCP	%	94			75-125	Pass	
Lead	B18-Ma32960	NCP	%	106			75-125	Pass	
Mercury	B18-Ma32960	NCP	%	95			70-130	Pass	
Nickel	B18-Ma32960	NCP	%	99			75-125	Pass	
Zinc	M18-Ma34952	NCP	%	109			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M18-Ma35753	NCP	mg/L	0.04	0.06	26	30%	Pass	
TRH C10-C14	M18-Ap06034	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M18-Ap06034	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M18-Ap06034	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-Ma35753	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M18-Ma35753	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M18-Ma35753	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M18-Ma35753	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M18-Ma35753	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M18-Ma35753	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-Ma35753	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M18-Ma35753	NCP	mg/L	0.04	0.06	32	30%	Fail	Q15
TRH >C10-C16	M18-Ap06034	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M18-Ap06034	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M18-Ap06034	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M18-Ma35360	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M18-Ma35360	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M18-Ma35360	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M18-Ma35360	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M18-Ma35360	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Ma35360	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-Ma35360	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Ma35360	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	M18-Ma35360	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	M18-Ma35360	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	M18-Ma35360	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M18-Ma35360	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ma35360	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	M18-Ma35360	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	M18-Ma35360	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	M18-Ma35360	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M18-Ma33099	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkane sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M18-Ma33099	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M18-Ma33099	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M18-Ma33099	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	M18-Ma33099	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	M18-Ma33099	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M18-Ma33099	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M18-Ma33099	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkane sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	M18-Ma33099	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M18-Ma33099	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	B18-Ma32960	NCP	mg/L	0.002	0.003	26	30%	Pass	
Cadmium	B18-Ma32960	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	B18-Ma32960	NCP	mg/L	0.006	0.006	<1	30%	Pass	
Copper	B18-Ma32960	NCP	mg/L	0.003	0.003	3.0	30%	Pass	
Lead	B18-Ma32960	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	B18-Ma32960	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	B18-Ma32960	NCP	mg/L	0.003	0.003	<1	30%	Pass	
Zinc	B18-Ma32960	NCP	mg/L	0.069	0.069	<1	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).
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

[redacted]

Analytical Services Manager
Senior Analyst-Metal (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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Enviro Sample Bris

From: [redacted]
Sent: Monday, 23 April 2018 10:30 AM
To: [redacted]
Cc: Enviro Sample Bris
Subject: RE: Analysis request - Taxiway Zulu

Thanks [redacted] holding will not be an issue for PFAS.

Brisbane can you please book in the below testing, all the PFAS tubs should be up there already!!

[redacted]

From: [redacted]
Sent: Monday, 23 April 2018 10:26 AM
To: [redacted]
Subject: Analysis request - Taxiway Zulu

EXTERNAL EMAIL*

Good morning [redacted]

For the samples on HOLD from Project Zulu, can we please get the following analysis performed:

Lab report number	Sample ID	Sampling date	Total 28 PFAS including PFOA/PFOS and 6:2 FTS	ASLP 28 PFAS including PFOA/PFOS and 6:2 FTS
591613	ZULU_SS024_1.15	27/03/2018	X	X
591613	ZULU_SS025_1.15	27/03/2018	X	X
591863	ZULU_SS007_1.1	28/03/2018	X	X
591863	ZULU_SS008_1.2	28/03/2018	X	X
591863	ZULU_SS009_0.92	28/03/2018	X	X
591925	ZULU_SS010_0.92	29/03/2018	X	X
591925	ZULU_SS031_0.8	29/03/2018	X	X
591925	ZULU_SS022_0.8	29/03/2018	X	X

If there are any issues with holding times etc please let me know. Otherwise, if you could please send through an ETA of when these results will be available that would be great.

Kind regards,

[redacted]

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Apr 27, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Apr 27, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Apr 27, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Apr 27, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
AUS Leaching Procedure	Brisbane	Apr 27, 2018	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			

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NATA # 1261 Site # 20794

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Site # 23736

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Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Project Name: TAXIWAY ZULU AND NOTHERN ACCESS ROUTE
Project ID: IS025200-550

Order No.:
Report #: 595728
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Apr 23, 2018 10:30 AM
Due: May 1, 2018
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						AUS Leaching Procedure	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	ZULU_SS024_1.15	Mar 27, 2018		Soil	B18-Ap30665		X	X
2	ZULU_SS024_1.15	Mar 27, 2018		AUS Leachate	B18-Ap30666	X		X
3	ZULU_SS025_1.15	Mar 27, 2018		Soil	B18-Ap30667		X	X
4	ZULU_SS025_1.15	Mar 27, 2018		AUS Leachate	B18-Ap30668	X		X
5	ZULU_SS007_1.1	Mar 27, 2018		Soil	B18-Ap30669		X	X
6	ZULU_SS007_	Mar 27, 2018		AUS Leachate	B18-Ap30670	X		X

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NATA # 1261 Site # 20794

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NATA # 1261
Site # 23736

Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Project Name: TAXIWAY ZULU AND NOTHERN ACCESS ROUTE
Project ID: IS025200-550

Order No.:
Report #: 595728
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Apr 23, 2018 10:30 AM
Due: May 1, 2018
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						AUS Leaching Procedure	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.1							
7	ZULU_SS008_1.2	Mar 27, 2018		Soil	B18-Ap30671		X	X
8	ZULU_SS008_1.2	Mar 27, 2018		AUS Leachate	B18-Ap30672	X		X
9	ZULU_SS009_0.92	Mar 27, 2018		Soil	B18-Ap30673		X	X
10	ZULU_SS009_0.92	Mar 27, 2018		AUS Leachate	B18-Ap30674	X		X
11	ZULU_SS010_0.92	Mar 29, 2018		Soil	B18-Ap30675		X	X
12	ZULU_SS010_0.92	Mar 29, 2018		AUS Leachate	B18-Ap30676	X		X
13	ZULU_SS031_	Mar 29, 2018		Soil	B18-Ap30677		X	X

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Site # 1254 & 14271

Sydney
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Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
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Sample Detail						AUS Leaching Procedure	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.8							
14	ZULU_SS031_0.8	Mar 29, 2018		AUS Leachate	B18-Ap30678	X		X
15	ZULU_SS022_0.8	Mar 29, 2018		Soil	B18-Ap30679		X	X
16	ZULU_SS022_0.8	Mar 29, 2018		AUS Leachate	B18-Ap30680	X		X
Test Counts						8	8	16

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

QC Data General Comments

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

Quality Control Results

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

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B18-Ap30670	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B18-Ap30670	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B18-Ap30670	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-Ap30670	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B18-Ap30670	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B18-Ap30670	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B18-Ap30670	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-Ap30670	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-Ap30670	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-Ap30670	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B18-Ap30670	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B18-Ap30670	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Ap30670	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Ap30670	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Ap30670	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Ap30670	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Ap30670	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Ap30670	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B18-Ap30670	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B18-Ap30670	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B18-Ap30670	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B18-Ap30670	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B18-Ap30670	CP	ug/L	0.02	0.01	15	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B18-Ap30670	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B18-Ap30670	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Ap30670	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Ap30670	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Ap30670	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B18-Ap30676	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B18-Ap30676	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B18-Ap30676	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-Ap30676	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B18-Ap30676	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B18-Ap30676	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B18-Ap30676	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-Ap30676	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-Ap30676	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-Ap30676	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B18-Ap30676	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B18-Ap30676	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Ap30676	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Ap30676	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Ap30676	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Ap30676	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Ap30676	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Ap30676	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B18-Ap30676	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B18-Ap30676	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B18-Ap30676	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B18-Ap30676	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B18-Ap30676	CP	ug/L	0.02	0.02	2.0	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B18-Ap30676	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B18-Ap30676	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Ap30676	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Ap30676	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Ap30676	CP	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
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised By

[redacted]

Analytical Services Manager
Senior Analyst-Organic (QLD)

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 History

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

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

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Apr 27, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Apr 27, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Apr 27, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Apr 27, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
% Moisture	Brisbane	Apr 27, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

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Site # 1254 & 14271

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Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

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

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

Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Project Name: TAXIWAY ZULU AND NOTHERN ACCESS ROUTE
Project ID: IS025200-550

Order No.:
Report #: 595728
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Apr 23, 2018 10:30 AM
Due: May 1, 2018
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Analytical Services Manager [redacted]

Sample Detail						AUS Leaching Procedure	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	ZULU_SS024_1.15	Mar 27, 2018		Soil	B18-Ap30665		X	X
2	ZULU_SS024_1.15	Mar 27, 2018		AUS Leachate	B18-Ap30666	X		X
3	ZULU_SS025_1.15	Mar 27, 2018		Soil	B18-Ap30667		X	X
4	ZULU_SS025_1.15	Mar 27, 2018		AUS Leachate	B18-Ap30668	X		X
5	ZULU_SS007_1.1	Mar 27, 2018		Soil	B18-Ap30669		X	X
6	ZULU_SS007_	Mar 27, 2018		AUS Leachate	B18-Ap30670	X		X

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NATA # 1261
Site # 23736

Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Project Name: TAXIWAY ZULU AND NOTHERN ACCESS ROUTE
Project ID: IS025200-550

Order No.:
Report #: 595728
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Apr 23, 2018 10:30 AM
Due: May 1, 2018
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Analytical Services Manager : [redacted]

Sample Detail						AUS Leaching Procedure	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	1.1							
7	ZULU_SS008_1.2	Mar 27, 2018		Soil	B18-Ap30671		X	X
8	ZULU_SS008_1.2	Mar 27, 2018		AUS Leachate	B18-Ap30672	X		X
9	ZULU_SS009_0.92	Mar 27, 2018		Soil	B18-Ap30673		X	X
10	ZULU_SS009_0.92	Mar 27, 2018		AUS Leachate	B18-Ap30674	X		X
11	ZULU_SS010_0.92	Mar 29, 2018		Soil	B18-Ap30675		X	X
12	ZULU_SS010_0.92	Mar 29, 2018		AUS Leachate	B18-Ap30676	X		X
13	ZULU_SS031_	Mar 29, 2018		Soil	B18-Ap30677		X	X

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Sample Detail						AUS Leaching Procedure	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
	0.8							
14	ZULU_SS031_0.8	Mar 29, 2018		AUS Leachate	B18-Ap30678	X		X
15	ZULU_SS022_0.8	Mar 29, 2018		Soil	B18-Ap30679		X	X
16	ZULU_SS022_0.8	Mar 29, 2018		AUS Leachate	B18-Ap30680	X		X
Test Counts						8	8	16

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	93			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	93			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	89			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	91			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	88			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	89			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	100			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	81			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	92			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	75			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	83			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctane sulfonamide (FOSA)	%	97			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	105			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	109			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	101			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	93			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	80			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	94			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	81			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	82			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	96			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	92			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	98			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	82			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	81			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	84			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	81			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	134			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B18-Ap30675	CP	%	97			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B18-Ap30675	CP	%	96			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B18-Ap30675	CP	%	89			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-Ap30675	CP	%	93			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B18-Ap30675	CP	%	91			50-150	Pass	
Perfluorononanoic acid (PFNA)	B18-Ap30675	CP	%	90			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B18-Ap30675	CP	%	103			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-Ap30675	CP	%	84			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-Ap30675	CP	%	93			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-Ap30675	CP	%	89			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B18-Ap30675	CP	%	91			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B18-Ap30675	CP	%	102			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Ap30675	CP	%	100			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Ap30675	CP	%	104			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Ap30675	CP	%	99			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Ap30675	CP	%	99			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Ap30675	CP	%	87			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Ap30675	CP	%	93			50-150	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B18-Ap30675	CP	%	83			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B18-Ap30675	CP	%	86			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B18-Ap30675	CP	%	84			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B18-Ap30675	CP	%	98			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B18-Ap30675	CP	%	93			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B18-Ap30675	CP	%	79			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B18-Ap30675	CP	%	94			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Ap30675	CP	%	112			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Ap30675	CP	%	85			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Ap30675	CP	%	124			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	A18-Ap26155	NCP	ug/kg	130	150	11	30%	Pass	
Perfluoropentanoic acid (PFPeA)	A18-Ap26155	NCP	ug/kg	160	180	13	30%	Pass	
Perfluorohexanoic acid (PFHxA)	A18-Ap26155	NCP	ug/kg	640	630	3.0	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	A18-Ap26155	NCP	ug/kg	21	26	20	30%	Pass	
Perfluorooctanoic acid (PFOA)	A18-Ap26155	NCP	ug/kg	28	34	22	30%	Pass	
Perfluorononanoic acid (PFNA)	A18-Ap26155	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	A18-Ap26155	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	A18-Ap26155	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	A18-Ap26155	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	A18-Ap26155	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	A18-Ap26155	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	A18-Ap26155	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	A18-Ap26155	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	A18-Ap26155	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	A18-Ap26155	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	A18-Ap26155	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	A18-Ap26155	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	A18-Ap26155	NCP	ug/kg	< 10	< 10	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	A18-Ap26155	NCP	ug/kg	310	350	11	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	A18-Ap26155	NCP	ug/kg	130	150	14	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	A18-Ap26155	NCP	ug/kg	290	360	22	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	A18-Ap26155	NCP	ug/kg	27	33	21	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	A18-Ap26155	NCP	ug/kg	550	630	14	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	A18-Ap26155	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	A18-Ap26155	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	A18-Ap26155	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	A18-Ap26155	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	A18-Ap26155	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B18-Ap30673	CP	%	17	16	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	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised By

[redacted]

Analytical Services Manager
Senior Analyst-Organic (QLD)
Senior Analyst-Metal (QLD)

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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ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1516327**	Page	: 1 of 50
Client	: **JACOBS GROUP (AUSTRALIA) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: [redacted]	Contact	: [redacted]
Address	: P O BOX 312 FLINDERS LANE MELBOURNE VIC AUSTRALIA 8009	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Facsimile	: [redacted]	Facsimile	: [redacted]
Project	: IS025200.110	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: ----	Date Samples Received	: 27-Oct-2015 14:55
C-O-C number	: ----	Date Analysis Commenced	: 06-Nov-2015
Sampler	: [redacted]	Issue Date	: 18-Nov-2015 18:02
Site	: ----		
		No. of samples received	: 50
Quote number	: ----	No. of samples analysed	: 36

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
[redacted]	Senior Inorganic Chemist	Melbourne Inorganics
	Senior Semivolatile Instrument Chemist	Melbourne Organics
	Laboratory Manager - Organics	Sydney Organics
	Senior Organic Chemist	Melbourne Organics

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.

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.

- EP075-EM: Poor surrogate due to sample matrix, confirmed by duplicate sample.
- EP066-EM/EP075-EM: Particular sample EM1516327_30 required dilution prior to analysis due to matrix interferences. LOR values have been adjusted accordingly.
- Sample aliquots for PFOS, PFOA, 6:2FTS and 8:2FTS for samples BH05_0.8 and BH05_1.3 have been taken from from jars containing teflon in the lining of the lids.
- 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.
- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1517082**	Page	: 1 of 3
Client	: **JACOBS GROUP (AUSTRALIA) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: [redacted]	Contact	: [redacted]
Address	: P O BOX 312 FLINDERS LANE MELBOURNE VIC AUSTRALIA 8009	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Facsimile	: [redacted]	Facsimile	: [redacted]
Project	: IS025200.110	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: ----	Date Samples Received	: 27-Oct-2015 14:55
C-O-C number	: ----	Date Analysis Commenced	: 06-Nov-2015
Sampler	: ----	Issue Date	: 24-Nov-2015 15:06
Site	: ----		
		No. of samples received	: 4
Quote number	: ----	No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
[redacted]	Senior Inorganic Chemist	Melbourne Inorganics
	Senior Semivolatile Instrument Chemist	Melbourne Organics
	Laboratory Manager - Organics	Sydney Organics

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.

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.

- This is a rebatch of EM1516327.
- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

[redacted]

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	Melbourne	Nov 09, 2015	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Nov 09, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Nov 09, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
BTEX and Naphthalene			
BTEX	Melbourne	Nov 09, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
PFOS/PFOA & 6:2FTS/8:2FTS	Brisbane	Nov 10, 2015	14 Day
- Method: LTM-ORG-2100 Analysis of PFCs in environmental samples by LC-MS/MS			
Metals M8	Melbourne	Nov 09, 2015	28 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
% Moisture	Melbourne	Nov 09, 2015	14 Day
- Method: LTM-GEN-7080 Moisture			

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Phone : +61 7 3902 4600
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Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Project Name: TAXIWAY ZULU & T2T
Project ID: ISO25200.110

Order No.:
Report #: 478567
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Nov 6, 2015 1:05 PM
Due: Nov 13, 2015
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Client Manager: [redacted]

Sample Detail					Metals M8	BTEX and Naphthalene	Moisture Set	PFOS/PFOA & 6:2FTS/8:2FTS	Total Recoverable Hydrocarbons
Laboratory where analysis is conducted									
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X		X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794								X	
External Laboratory									
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**					
BH11_1.0	Oct 22, 2015		Soil	M15-No05142	X	X	X	X	X
BH07_0.8	Oct 22, 2015		Soil	M15-No05143	X	X	X	X	X
BH16_0.7	Oct 22, 2015		Soil	M15-No05144	X	X	X	X	X
BH05_0.8	Oct 22, 2015		Soil	M15-No05145	X	X	X	X	X
BH02_0.5	Oct 22, 2015		Soil	M15-No05146	X	X	X	X	X

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. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. 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. 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.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
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 20-130%.

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, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene 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 Arochlor 1260 in Matrix Spikes and LCS's.
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 RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

[redacted]

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							
PFOS/PFOA & 6:2FTS/8:2FTS							
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	mg/kg	< 0.005			0.005	Pass	
Perfluorooctanesulfonic acid (PFOS)	mg/kg	< 0.005			0.005	Pass	
Perfluorooctanoic acid (PFOA)	mg/kg	< 0.005			0.005	Pass	
1H.1H.2H.2H-perfluorooctansulfonic acid (6:2 FTS)	mg/kg	< 0.01			0.01	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	93			70-130	Pass	
TRH C10-C14	%	124			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	107			70-130	Pass	
Toluene	%	115			70-130	Pass	
Ethylbenzene	%	104			70-130	Pass	
m&p-Xylenes	%	116			70-130	Pass	
Xylenes - Total	%	111			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							

[redacted]

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Naphthalene	%	107			70-130	Pass	
TRH C6-C10	%	85			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	113			70-130	Pass	
LCS - % Recovery							
PFOS/PFOA & 6:2FTS/8:2FTS							
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	%	72			70-130	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	105			70-130	Pass	
Perfluorooctanoic acid (PFOA)	%	118			70-130	Pass	
1H.1H.2H.2H-perfluorooctansulfonic acid (6:2 FTS)	%	125			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	93			80-120	Pass	
Cadmium	%	104			80-120	Pass	
Chromium	%	113			80-120	Pass	
Copper	%	114			80-120	Pass	
Lead	%	109			80-120	Pass	
Mercury	%	117			75-125	Pass	
Nickel	%	113			80-120	Pass	
Zinc	%	100			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M15-No05148	NCP	%	76			70-130	Pass	
TRH C10-C14	M15-No05833	NCP	%	118			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M15-No05148	NCP	%	95			70-130	Pass	
Toluene	M15-No05148	NCP	%	99			70-130	Pass	
Ethylbenzene	M15-No05148	NCP	%	92			70-130	Pass	
m&p-Xylenes	M15-No05148	NCP	%	104			70-130	Pass	
o-Xylene	M15-No05148	NCP	%	91			70-130	Pass	
Xylenes - Total	M15-No05148	NCP	%	99			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M15-No05148	NCP	%	89			70-130	Pass	
TRH C6-C10	M15-No05148	NCP	%	70			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M15-No05833	NCP	%	117			70-130	Pass	
Spike - % Recovery									
PFOS/PFOA & 6:2FTS/8:2FTS				Result 1					
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	B15-No05376	NCP	%	85			70-130	Pass	
Perfluorooctanesulfonic acid (PFOS)	B15-No05376	NCP	%	105			70-130	Pass	
Perfluorooctanoic acid (PFOA)	B15-No05376	NCP	%	116			70-130	Pass	
1H.1H.2H.2H-perfluorooctansulfonic acid (6:2 FTS)	B15-No05376	NCP	%	118			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M15-No05637	NCP	%	80			75-125	Pass	

[redacted]

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Cadmium	M15-No05647	NCP	%	80			75-125	Pass	
Chromium	M15-No05647	NCP	%	84			75-125	Pass	
Copper	M15-No05647	NCP	%	95			75-125	Pass	
Lead	M15-No05647	NCP	%	83			75-125	Pass	
Mercury	M15-No05689	NCP	%	117			70-130	Pass	
Nickel	M15-No05647	NCP	%	81			75-125	Pass	
Zinc	M15-No05647	NCP	%	94			75-125	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	M15-No04632	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M15-No05830	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M15-No05830	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M15-No05830	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M15-No04632	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M15-No04632	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M15-No04632	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M15-No04632	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M15-No04632	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M15-No04632	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M15-No04632	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M15-No04632	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M15-No05830	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M15-No05830	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M15-No05830	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
PFOS/PFOA & 6:2FTS/8:2FTS				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	M15-No05142	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M15-No05142	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M15-No05142	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctansulfonic acid (6:2 FTS)	M15-No05142	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M15-No05647	NCP	mg/kg	5.5	6.4	15	30%	Pass	
Cadmium	M15-No05647	NCP	mg/kg	0.4	0.4	1.0	30%	Pass	
Chromium	M15-No05647	NCP	mg/kg	16	16	1.0	30%	Pass	
Copper	M15-No05647	NCP	mg/kg	7.3	7.3	<1	30%	Pass	
Lead	M15-No05647	NCP	mg/kg	16	18	11	30%	Pass	
Mercury	M15-No05626	NCP	mg/kg	0.2	0.2	23	30%	Pass	
Nickel	M15-No05647	NCP	mg/kg	8.4	8.4	<1	30%	Pass	
Zinc	M15-No05647	NCP	mg/kg	65	71	8.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M15-No05146	CP	%	12	13	7.0	30%	Pass	

[redacted]

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 standard.

Authorised By

[redacted]

Analytical Services Manager
Senior Analyst-Organic (VIC)
Senior Analyst-Volatile (VIC)
Senior Analyst-Metal (VIC)
Senior Analyst-Inorganic (VIC)
Senior Analyst-Organic (QLD)

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

Uncertainty data is available on request

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[redacted]

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	Melbourne	Nov 19, 2015	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Nov 19, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Nov 19, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
PFOS/PFOA & 6:2FTS/8:2FTS	Brisbane	Nov 20, 2015	14 Day
- Method: LTM-ORG-2100 Analysis of PFCs in environmental samples by LC-MS/MS			
Metals M8	Melbourne	Nov 19, 2015	28 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
% Moisture	Melbourne	Nov 19, 2015	14 Day
- Method: LTM-GEN-7080 Moisture			

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NATA # 1261 Site # 20794

Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
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VIC 8009

Project Name: TAXIWAY ZULU & T2T
Project ID: IS025200-110

Order No.:
Report #: 480102
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Nov 18, 2015 3:47 PM
Due: Nov 25, 2015
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Client Manager: [redacted]

Sample Detail					Metals M8	Moisture Set	PFOS/PFOA & 6:2FTS/8:2FTS	Total Recoverable Hydrocarbons
Laboratory where analysis is conducted								
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X		X
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794							X	
External Laboratory								
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
QA/QC_3	Oct 21, 2015		Soil	M15-No14958	X	X	X	X
QA/QC_5	Oct 23, 2015		Soil	M15-No14959	X	X	X	X
QA/QC_1	Oct 20, 2015		Soil	M15-No14960	X	X	X	X
QA/QC_2	Oct 21, 2015		Soil	M15-No14961	X	X	X	X

[redacted]

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. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. 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. 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.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
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 20-130%.

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, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene 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 Arochlor 1260 in Matrix Spikes and LCS's.
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 RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

[redacted]

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							
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							
PFOS/PFOA & 6:2FTS/8:2FTS							
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	mg/kg	< 0.005			0.005	Pass	
Perfluorooctanesulfonic acid (PFOS)	mg/kg	< 0.005			0.005	Pass	
Perfluorooctanoic acid (PFOA)	mg/kg	< 0.005			0.005	Pass	
1H.1H.2H.2H-perfluorooctansulfonic acid (6:2 FTS)	mg/kg	< 0.01			0.01	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	77			70-130	Pass	
TRH C10-C14	%	127			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	88			70-130	Pass	
TRH C6-C10	%	73			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	127			70-130	Pass	
LCS - % Recovery							
PFOS/PFOA & 6:2FTS/8:2FTS							
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	%	88			70-130	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	118			70-130	Pass	
Perfluorooctanoic acid (PFOA)	%	103			70-130	Pass	
1H.1H.2H.2H-perfluorooctansulfonic acid (6:2 FTS)	%	102			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	90			80-120	Pass	
Cadmium	%	98			80-120	Pass	

[redacted]

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chromium			%	102			80-120	Pass	
Copper			%	102			80-120	Pass	
Lead			%	104			80-120	Pass	
Mercury			%	96			75-125	Pass	
Nickel			%	102			80-120	Pass	
Zinc			%	104			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M15-No14915	NCP	%	80			70-130	Pass	
TRH C10-C14	M15-No14012	NCP	%	101			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M15-No14915	NCP	%	81			70-130	Pass	
TRH C6-C10	M15-No14915	NCP	%	86			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M15-No14012	NCP	%	101			70-130	Pass	
Spike - % Recovery									
PFOS/PFOA & 6:2FTS/8:2FTS				Result 1					
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	B15-No17170	NCP	%	84			70-130	Pass	
Perfluorooctanesulfonic acid (PFOS)	B15-No17170	NCP	%	116			70-130	Pass	
Perfluorooctanoic acid (PFOA)	B15-No17170	NCP	%	104			70-130	Pass	
1H.1H.2H.2H-perfluorooctansulfonic acid (6:2 FTS)	B15-No17170	NCP	%	126			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M15-No14667	NCP	%	90			75-125	Pass	
Cadmium	M15-No14667	NCP	%	92			75-125	Pass	
Chromium	M15-No14667	NCP	%	89			75-125	Pass	
Copper	M15-No14667	NCP	%	111			75-125	Pass	
Lead	M15-No14667	NCP	%	100			75-125	Pass	
Mercury	M15-No14667	NCP	%	114			70-130	Pass	
Nickel	M15-No14667	NCP	%	81			75-125	Pass	
Zinc	M15-No14667	NCP	%	101			75-125	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	M15-No14833	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M15-No14011	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M15-No14011	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M15-No14011	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M15-No14833	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M15-No14833	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M15-No14011	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M15-No14011	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M15-No14011	NCP	mg/kg	< 100	< 100	<1	30%	Pass	

[redacted]

Duplicate									
PFOS/PFOA & 6:2FTS/8:2FTS				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTS)	M15-No14958	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M15-No14958	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M15-No14958	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctansulfonic acid (6:2 FTS)	M15-No14958	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M15-No14666	NCP	mg/kg	4.4	4.9	10	30%	Pass	
Cadmium	M15-No14666	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M15-No14666	NCP	mg/kg	20	19	3.0	30%	Pass	
Copper	M15-No14666	NCP	mg/kg	11	11	1.0	30%	Pass	
Lead	M15-No14666	NCP	mg/kg	33	32	3.0	30%	Pass	
Mercury	M15-No14666	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	M15-No14666	NCP	mg/kg	7.0	7.0	<1	30%	Pass	
Zinc	M15-No14666	NCP	mg/kg	47	49	3.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M15-No14960	CP	%	25	25	2.0	30%	Pass	

[redacted]

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	No
Some samples have been subcontracted	No

Qualifier Codes/Comments

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

Authorised By

[redacted]

Analytical Services Manager
Senior Analyst-Organic (VIC)
Senior Analyst-Volatile (VIC)
Senior Analyst-Metal (VIC)
Senior Analyst-Inorganic (VIC)
Senior Analyst-Organic (QLD)

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

Uncertainty data is available on request

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[redacted]

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Vic EPA IWRG 621 (Solids)			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jul 23, 2014	14 Day
- Method: TRH C6-C36 - MGT 100A			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jul 23, 2014	14 Day
- Method: LM-LTM-ORG2010			
Volatile Organics	Melbourne	Jul 23, 2014	7 Day
- Method: USEPA 8260 - MGT 350A Volatile Organics by GCMS			
Polycyclic Aromatic Hydrocarbons	Melbourne	Jul 23, 2014	14 Day
- Method: USEPA 8270 Polycyclic Aromatic Hydrocarbons			
Organochlorine Pesticides	Melbourne	Jul 23, 2014	14 Day
- Method: USEPA 8081 Organochlorine Pesticides			
Polychlorinated Biphenyls	Melbourne	Jul 23, 2014	28 Day
- Method: USEPA 8082 Polychlorinated Biphenyls			
Phenols (Halogenated)	Melbourne	Jul 23, 2014	14 Day
- Method: USEPA 8270 Phenols			
Phenols (non-Halogenated)	Melbourne	Jul 23, 2014	14 Day
- Method: USEPA 8270 Phenols			
Chromium (hexavalent)	Melbourne	Jul 23, 2014	28 Day
- Method: APHA 3500-Cr Hexavalent Chromium- (Extraction:- USEPA3060)			
Cyanide (total)	Melbourne	Jul 23, 2014	14 Day
- Method: USEPA 9010 Cyanide			
Fluoride	Melbourne	Jul 23, 2014	28 Day
- Method: NEPC 404 (Fusion followed by ISE)			
pH (1:5 Aqueous extract)	Melbourne	Jul 24, 2014	7 Day
- Method: LM-LTM-INO-4000			
IWRG 621 Metals : Metals M12	Melbourne	Jul 23, 2014	28 Day
- Method: USEPA 6010/6020 Heavy Metals & USEPA 7470/71 Mercury			
Glycols	Melbourne	Jul 23, 2014	14 Day
- Method: GLYCOLS- US EPA SW846 METHOD 8000 GC-FID.			
PFOS/PFOA/6:2FTS	Brisbane	Jul 25, 2014	14 Day
- Method: LTM-ORG-2100 Determination of PFCs in aqueous and soil samples by LC-MS/MS			
% Moisture	Melbourne	Jul 23, 2014	14 Day
- Method: Method 102 - ANZECC - % Moisture			

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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

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Address: PO Box 312 Flinders Lane
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VIC 8009

Client Job No.: TAXIWAY ZULU

Order No.:
Report #: 425883
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Jul 22, 2014 10:59 AM
Due: Jul 29, 2014
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Client Manager: [redacted]

Sample Detail					% Moisture	TRH C10-C14	TRH C15-C28	TRH C29-C36	TRH C36+	Polycyclic Aromatic Hydrocarbons	Glycols	Australian Standard Leaching Procedure (ASLP)	Phenols (IWRG 621)	PFOS/PFOA/6:2FTS	Vic EPA IWRG 621 (Solids)
Laboratory where analysis is conducted															
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	X	X	X	X	X	X		X
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794														X	
External Laboratory															
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
TP01 0.3	Jul 17, 2014		Soil	M14-Jl19143	X						X			X	X
TP01 1.0	Jul 17, 2014		Soil	M14-Jl19144	X										X
TP02 0.3	Jul 17, 2014		Soil	M14-Jl19145	X						X				X
TP02 1.0	Jul 17, 2014		Soil	M14-Jl19146	X										X
TP03 0.3	Jul 17, 2014		Soil	M14-Jl19147	X									X	X
TP03 1.0	Jul 17, 2014		Soil	M14-Jl19148	X										X
TP04 0.3	Jul 17, 2014		Soil	M14-Jl19149	X						X				X
TP04 1.0	Jul 17, 2014		Soil	M14-Jl19150	X										X
TP05 0.3	Jul 17, 2014		Soil	M14-Jl19151	X						X			X	X
TP05 1.0	Jul 17, 2014		Soil	M14-Jl19152	X										X

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NATA # 1261 Site # 20794

Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Client Job No.: TAXIWAY ZULU

Order No.:
Report #: 425883
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Jul 22, 2014 10:59 AM
Due: Jul 29, 2014
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Client Manager: [redacted]

Sample Detail					% Moisture	TRH C10-C14	TRH C15-C28	TRH C29-C36	TRH C36+	Polycyclic Aromatic Hydrocarbons	Glycols	Australian Standard Leaching Procedure (ASLP)	Phenols (IWRG 621)	PFOS/PFOA/6:2FTS	Vic EPA IWRG 621 (Solids)
Laboratory where analysis is conducted															
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	X	X	X	X	X	X		X
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794														X	
External Laboratory															
TP06 0.3	Jul 17, 2014		Soil	M14-Jl19153	X						X				X
TP06 1.0	Jul 17, 2014		Soil	M14-Jl19154	X										X
TP07 0.3	Jul 17, 2014		Soil	M14-Jl19155	X						X				X
TP07 1.0	Jul 17, 2014		Soil	M14-Jl19156	X										X
TP08 0.3	Jul 17, 2014		Soil	M14-Jl19157	X						X			X	X
TP08 1.0	Jul 17, 2014		Soil	M14-Jl19158	X										X
TP09 0.3	Jul 17, 2014		Soil	M14-Jl19159	X						X				X
TP09 1.0	Jul 17, 2014		Soil	M14-Jl19160	X										X
TP10 0.3	Jul 17, 2014		Soil	M14-Jl19161	X									X	X
TP010 1.0	Jul 17, 2014		Soil	M14-Jl19162	X										X
TP012 0.3	Jul 17, 2014		Soil	M14-Jl19163	X						X			X	X

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Laboratory where analysis is conducted															
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	X	X	X	X	X	X		X
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794														X	
External Laboratory															
TP012 1.0	Jul 17, 2014		Soil	M14-Jl19164	X										X
TP013 0.3	Jul 17, 2014		Soil	M14-Jl19165	X						X			X	X
TP013 1.0	Jul 17, 2014		Soil	M14-Jl19166	X										X
TP014 0.3	Jul 17, 2014		Soil	M14-Jl19167	X									X	X
TP015 0.3	Jul 17, 2014		Soil	M14-Jl19169	X						X				X
TP015 1.0	Jul 17, 2014		Soil	M14-Jl19170	X										X
TP016 0.3	Jul 17, 2014		Soil	M14-Jl19171	X									X	X
TP016 1.0	Jul 17, 2014		Soil	M14-Jl19172	X										X
TP017 0.3	Jul 17, 2014		Soil	M14-Jl19173	X									X	X
TP017 1.0	Jul 17, 2014		Soil	M14-Jl19174	X										X
TP018 0.3	Jul 17, 2014		Soil	M14-Jl19175	X						X				X

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Sample Detail					% Moisture	TRH C10-C14	TRH C15-C28	TRH C29-C36	TRH C36+	Polycyclic Aromatic Hydrocarbons	Glycols	Australian Standard Leaching Procedure (ASLP)	Phenols (IWRG 621)	PFOS/PFOA/6:2FTS	Vic EPA IWRG 621 (Solids)
Laboratory where analysis is conducted															
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	X	X	X	X	X	X		X
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794														X	
External Laboratory															
TP018 1.0	Jul 17, 2014		Soil	M14-Jl19176	X										X
QA1	Jul 17, 2014		Soil	M14-Jl19177	X						X			X	X
QA3	Jul 17, 2014		Soil	M14-Jl19178	X						X			X	X
RINSATE 1	Jul 15, 2014		Water	M14-Jl19179		X	X	X	X	X			X		
RINSATE 2	Jul 16, 2014		Water	M14-Jl19180		X	X	X	X	X			X		
RINSATE 3	Jul 17, 2014		Water	M14-Jl19181		X	X	X	X	X			X		
TP01 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19182	X							X		X	
TP03 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19183	X							X		X	
TP05 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19184	X							X		X	
TP08 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19185	X							X		X	
TP10 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19186	X							X		X	

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Sample Detail					% Moisture	TRH C10-C14	TRH C15-C28	TRH C29-C36	TRH C36+	Polycyclic Aromatic Hydrocarbons	Glycols	Australian Standard Leaching Procedure (ASLP)	Phenols (IWRG 621)	PFOS/PFOA/6:2FTS	Vic EPA IWRG 621 (Solids)
Laboratory where analysis is conducted															
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	X	X	X	X	X	X		X
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794														X	
External Laboratory															
TP12 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19187	X							X		X	
TP13 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19188	X							X		X	
TP14 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19189	X							X		X	
TP16 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19190	X							X		X	
TP17 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19191	X							X		X	

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. 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 Acknowledgment.

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: 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. 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.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
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 20-130%.

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, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene 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 Arochlor 1260 in Matrix Spikes and LCS's.
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 RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

[redacted]

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							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH C6-C10 less BTEX (F1)	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Volatile Organics							
1.2.4-Trichlorobenzene	mg/kg	< 0.2			0.2	Pass	
Hexachlorobutadiene	mg/kg	< 0.2			0.2	Pass	
1.1-Dichloroethane	mg/kg	< 0.05			0.05	Pass	
1.1-Dichloroethene	mg/kg	< 0.05			0.05	Pass	
1.1.1-Trichloroethane	mg/kg	< 0.05			0.05	Pass	
1.1.1.2-Tetrachloroethane	mg/kg	< 0.05			0.05	Pass	
1.1.2-Trichloroethane	mg/kg	< 0.05			0.05	Pass	
1.1.2.2-Tetrachloroethane	mg/kg	< 0.05			0.05	Pass	
1.2-Dibromoethane	mg/kg	< 0.05			0.05	Pass	
1.2-Dichlorobenzene	mg/kg	< 0.05			0.05	Pass	
1.2-Dichloroethane	mg/kg	< 0.05			0.05	Pass	
1.2-Dichloropropane	mg/kg	< 0.05			0.05	Pass	
1.2.3-Trichloropropane	mg/kg	< 0.05			0.05	Pass	
1.2.4-Trimethylbenzene	mg/kg	< 0.05			0.05	Pass	
1.3-Dichlorobenzene	mg/kg	< 0.05			0.05	Pass	
1.3-Dichloropropane	mg/kg	< 0.05			0.05	Pass	
1.3.5-Trimethylbenzene	mg/kg	< 0.05			0.05	Pass	
1.4-Dichlorobenzene	mg/kg	< 0.05			0.05	Pass	
2-Butanone (MEK)	mg/kg	< 0.05			0.05	Pass	
2-Propanone (Acetone)	mg/kg	< 0.05			0.05	Pass	
4-Chlorotoluene	mg/kg	< 0.05			0.05	Pass	
4-Methyl-2-pentanone (MIBK)	mg/kg	< 0.05			0.05	Pass	
Allyl chloride	mg/kg	< 0.05			0.05	Pass	
Benzene	mg/kg	< 0.1			0.1	Pass	
Bromobenzene	mg/kg	< 0.05			0.05	Pass	
Bromochloromethane	mg/kg	< 0.05			0.05	Pass	
Bromodichloromethane	mg/kg	< 0.05			0.05	Pass	
Bromoform	mg/kg	< 0.05			0.05	Pass	
Bromomethane	mg/kg	< 0.05			0.05	Pass	
Carbon disulfide	mg/kg	< 0.05			0.05	Pass	
Carbon Tetrachloride	mg/kg	< 0.05			0.05	Pass	
Chlorobenzene	mg/kg	< 0.05			0.05	Pass	
Chloroethane	mg/kg	< 0.05			0.05	Pass	
Chloroform	mg/kg	< 0.05			0.05	Pass	
Chloromethane	mg/kg	< 0.05			0.05	Pass	
cis-1.2-Dichloroethene	mg/kg	< 0.05			0.05	Pass	

[redacted]

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
cis-1.3-Dichloropropene	mg/kg	< 0.05			0.05	Pass	
Dibromochloromethane	mg/kg	< 0.05			0.05	Pass	
Dibromomethane	mg/kg	< 0.05			0.05	Pass	
Dichlorodifluoromethane	mg/kg	< 0.05			0.05	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
Iodomethane	mg/kg	< 0.05			0.05	Pass	
Isopropyl benzene (Cumene)	mg/kg	< 0.05			0.05	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
Methylene Chloride	mg/kg	< 0.05			0.05	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Styrene	mg/kg	< 0.05			0.05	Pass	
Tetrachloroethene	mg/kg	< 0.05			0.05	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
trans-1.2-Dichloroethene	mg/kg	< 0.05			0.05	Pass	
trans-1.3-Dichloropropene	mg/kg	< 0.05			0.05	Pass	
Trichloroethene	mg/kg	< 0.05			0.05	Pass	
Trichlorofluoromethane	mg/kg	< 0.05			0.05	Pass	
Vinyl chloride	mg/kg	< 0.05			0.05	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	

[redacted]

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Glycols							
Di-Ethylene Glycol*	mg/kg	< 20			20	Pass	
Ethylene glycol*	mg/kg	< 20			20	Pass	
Propylene glycol*	mg/kg	< 20			20	Pass	
Triethylene glycol*	mg/kg	< 20			20	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1.0	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1.0	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1.0	Pass	
Pentachlorophenol	mg/kg	< 1			1.0	Pass	
Tetrachlorophenols - Total	mg/kg	< 1			1.0	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
2-Nitrophenol	mg/kg	< 1			1.0	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
PFOS/PFOA/6:2FTS							
Perfluorooctanesulfonic acid (PFOS)	mg/kg	< 0.005			0.005	Pass	
Perfluorooctanoic acid (PFOA)	mg/kg	< 0.005			0.005	Pass	
1H.1H.2H.2H-perfluorooctansulfonic acid (6:2 FTS)	mg/kg	< 0.005			0.005	Pass	
Method Blank							
Chromium (hexavalent)	mg/kg	< 1			1	Pass	
Cyanide (total)	mg/kg	< 5			5	Pass	
Fluoride	mg/kg	< 100			100	Pass	
Method Blank							

[redacted]

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Molybdenum	mg/kg	< 10			10	Pass	
Nickel	mg/kg	< 5			5	Pass	
Selenium	mg/kg	< 2			2	Pass	
Silver	mg/kg	< 5			5	Pass	
Tin	mg/kg	< 10			10	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	90			70-130	Pass	
TRH C10-C14	%	130			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	78			75-125	Pass	
TRH C6-C10	%	90			70-130	Pass	
TRH >C10-C16	%	126			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	86			70-130	Pass	
1.1.1-Trichloroethane	%	106			70-130	Pass	
1.2-Dichloroethane	%	103			70-130	Pass	
Benzene	%	114			70-130	Pass	
Ethylbenzene	%	115			70-130	Pass	
m&p-Xylenes	%	123			70-130	Pass	
Toluene	%	116			70-130	Pass	
Trichloroethene	%	80			70-130	Pass	
Xylenes - Total	%	121			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	81			70-130	Pass	
Acenaphthylene	%	77			70-130	Pass	
Anthracene	%	80			70-130	Pass	
Benz(a)anthracene	%	72			70-130	Pass	
Benzo(a)pyrene	%	80			70-130	Pass	
Benzo(b&j)fluoranthene	%	72			70-130	Pass	
Benzo(g.h.i)perylene	%	74			70-130	Pass	
Benzo(k)fluoranthene	%	83			70-130	Pass	
Chrysene	%	80			70-130	Pass	
Dibenz(a.h)anthracene	%	76			70-130	Pass	
Fluoranthene	%	81			70-130	Pass	
Fluorene	%	81			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	74			70-130	Pass	
Naphthalene	%	80			70-130	Pass	
Phenanthrene	%	76			70-130	Pass	
Pyrene	%	84			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	128			70-130	Pass	

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Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
4.4'-DDE	%	118			70-130	Pass	
4.4'-DDT	%	83			70-130	Pass	
a-BHC	%	119			70-130	Pass	
Aldrin	%	128			70-130	Pass	
b-BHC	%	115			70-130	Pass	
d-BHC	%	127			70-130	Pass	
Dieldrin	%	119			70-130	Pass	
Endosulfan I	%	118			70-130	Pass	
Endosulfan II	%	116			70-130	Pass	
Endosulfan sulphate	%	123			70-130	Pass	
Endrin	%	97			70-130	Pass	
Endrin aldehyde	%	123			70-130	Pass	
Endrin ketone	%	113			70-130	Pass	
g-BHC (Lindane)	%	115			70-130	Pass	
Heptachlor	%	106			70-130	Pass	
Heptachlor epoxide	%	120			70-130	Pass	
Hexachlorobenzene	%	102			70-130	Pass	
Methoxychlor	%	75			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	129			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	78			30-130	Pass	
2.4-Dichlorophenol	%	61			30-130	Pass	
2.4.5-Trichlorophenol	%	75			30-130	Pass	
2.4.6-Trichlorophenol	%	57			30-130	Pass	
2.6-Dichlorophenol	%	64			30-130	Pass	
4-Chloro-3-methylphenol	%	70			30-130	Pass	
Pentachlorophenol	%	31			30-130	Pass	
Tetrachlorophenols - Total	%	55			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	37			30-130	Pass	
2-Methyl-4.6-dinitrophenol	%	32			30-130	Pass	
2-Methylphenol (o-Cresol)	%	67			30-130	Pass	
2-Nitrophenol	%	63			30-130	Pass	
2.4-Dimethylphenol	%	59			30-130	Pass	
2.4-Dinitrophenol	%	35			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	76			30-130	Pass	
4-Nitrophenol	%	35			30-130	Pass	
Dinoseb	%	31			30-130	Pass	
Phenol	%	74			30-130	Pass	
LCS - % Recovery							
PFOS/PFOA/6:2FTS							
Perfluorooctanesulfonic acid (PFOS)	%	76			70-130	Pass	
Perfluorooctanoic acid (PFOA)	%	74			70-130	Pass	
1H.1H.2H.2H-perfluorooctansulfonic acid (6:2 FTS)	%	80			70-130	Pass	
LCS - % Recovery							
Chromium (hexavalent)	%	98			70-130	Pass	
Cyanide (total)	%	103			70-130	Pass	
Fluoride	%	82			70-130	Pass	
LCS - % Recovery							
Heavy Metals							

[redacted]

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Arsenic			%	102			80-120	Pass	
Cadmium			%	109			80-120	Pass	
Chromium			%	112			80-120	Pass	
Copper			%	113			80-120	Pass	
Lead			%	113			80-120	Pass	
Mercury			%	105			75-125	Pass	
Molybdenum			%	114			80-120	Pass	
Nickel			%	103			80-120	Pass	
Selenium			%	104			80-120	Pass	
Silver			%	108			80-120	Pass	
Tin			%	105			80-120	Pass	
Zinc			%	112			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M14-Jl19676	NCP	%	77			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M14-Jl19145	CP	%	74			70-130	Pass	
Acenaphthylene	M14-Jl19145	CP	%	74			70-130	Pass	
Anthracene	M14-Jl19145	CP	%	76			70-130	Pass	
Benz(a)anthracene	M14-Jl19145	CP	%	73			70-130	Pass	
Benzo(a)pyrene	M14-Jl19145	CP	%	81			70-130	Pass	
Benzo(b&j)fluoranthene	M14-Jl19145	CP	%	73			70-130	Pass	
Benzo(g.h.i)perylene	M14-Jl19145	CP	%	97			70-130	Pass	
Benzo(k)fluoranthene	M14-Jl19145	CP	%	85			70-130	Pass	
Chrysene	M14-Jl19145	CP	%	82			70-130	Pass	
Dibenz(a.h)anthracene	M14-Jl19145	CP	%	83			70-130	Pass	
Fluoranthene	M14-Jl19145	CP	%	79			70-130	Pass	
Fluorene	M14-Jl19145	CP	%	74			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M14-Jl19145	CP	%	84			70-130	Pass	
Naphthalene	M14-Jl19145	CP	%	75			70-130	Pass	
Phenanthrene	M14-Jl19145	CP	%	72			70-130	Pass	
Pyrene	M14-Jl19145	CP	%	79			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	M14-Jl19145	CP	%	73			30-130	Pass	
2.4-Dichlorophenol	M14-Jl19145	CP	%	54			30-130	Pass	
2.4.5-Trichlorophenol	M14-Jl19145	CP	%	67			30-130	Pass	
2.4.6-Trichlorophenol	M14-Jl19145	CP	%	51			30-130	Pass	
2.6-Dichlorophenol	M14-Jl19145	CP	%	59			30-130	Pass	
4-Chloro-3-methylphenol	M14-Jl19145	CP	%	64			30-130	Pass	
Pentachlorophenol	M14-Jl19145	CP	%	36			30-130	Pass	
Tetrachlorophenols - Total	M14-Jl19145	CP	%	49			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Methyl-4.6-dinitrophenol	M14-Jl19145	CP	%	32			30-130	Pass	
2-Methylphenol (o-Cresol)	M14-Jl19145	CP	%	64			30-130	Pass	
2-Nitrophenol	M14-Jl19145	CP	%	59			30-130	Pass	
2.4-Dimethylphenol	M14-Jl19145	CP	%	58			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M14-Jl19145	CP	%	68			30-130	Pass	
4-Nitrophenol	M14-Jl19145	CP	%	37			30-130	Pass	
Dinoseb	M14-Jl19145	CP	%	34			30-130	Pass	
Phenol	M14-Jl19145	CP	%	66			30-130	Pass	

[redacted]

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Cyanide (total)	M14-Jl19146	CP	%	112			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M14-Jl19147	CP	%	112			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	M14-Jl19147	CP	%	113			70-130	Pass	
Spike - % Recovery									
PFOS/PFOA/6:2FTS				Result 1					
Perfluorooctanesulfonic acid (PFOS)	M14-Jl19147	CP	%	77			70-130	Pass	
Perfluorooctanoic acid (PFOA)	M14-Jl19147	CP	%	82			70-130	Pass	
1H.1H.2H.2H-perfluorooctansulfonic acid (6:2 FTS)	M14-Jl19147	CP	%	106			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M14-Jl19149	CP	%	130			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M14-Jl19149	CP	%	125			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Cadmium	M14-Jl19149	CP	%	99			75-125	Pass	
Chromium	M14-Jl19149	CP	%	101			75-125	Pass	
Copper	M14-Jl19149	CP	%	104			75-125	Pass	
Lead	M14-Jl19149	CP	%	99			75-125	Pass	
Mercury	M14-Jl19149	CP	%	94			70-130	Pass	
Molybdenum	M14-Jl19149	CP	%	99			75-125	Pass	
Nickel	M14-Jl19149	CP	%	90			75-125	Pass	
Selenium	M14-Jl19149	CP	%	85			75-125	Pass	
Silver	M14-Jl19149	CP	%	100			75-125	Pass	
Tin	M14-Jl19149	CP	%	79			75-125	Pass	
Zinc	M14-Jl19149	CP	%	100			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M14-Jl19155	CP	%	85			70-130	Pass	
Acenaphthylene	M14-Jl19155	CP	%	83			70-130	Pass	
Anthracene	M14-Jl19155	CP	%	78			70-130	Pass	
Benz(a)anthracene	M14-Jl19155	CP	%	81			70-130	Pass	
Benzo(a)pyrene	M14-Jl19155	CP	%	88			70-130	Pass	
Benzo(b&j)fluoranthene	M14-Jl19155	CP	%	81			70-130	Pass	
Benzo(g.h.i)perylene	M14-Jl19155	CP	%	86			70-130	Pass	
Benzo(k)fluoranthene	M14-Jl19155	CP	%	84			70-130	Pass	
Chrysene	M14-Jl19155	CP	%	82			70-130	Pass	
Dibenz(a.h)anthracene	M14-Jl19155	CP	%	74			70-130	Pass	
Fluoranthene	M14-Jl19155	CP	%	93			70-130	Pass	
Fluorene	M14-Jl19155	CP	%	86			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M14-Jl19155	CP	%	86			70-130	Pass	
Naphthalene	M14-Jl19155	CP	%	80			70-130	Pass	
Phenanthrene	M14-Jl19155	CP	%	80			70-130	Pass	
Pyrene	M14-Jl19155	CP	%	93			70-130	Pass	
Spike - % Recovery									

[redacted]

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenols (Halogenated)				Result 1					
2-Chlorophenol	M14-Jl19155	CP	%	80			30-130	Pass	
2.4-Dichlorophenol	M14-Jl19155	CP	%	71			30-130	Pass	
2.4.5-Trichlorophenol	M14-Jl19155	CP	%	74			30-130	Pass	
2.4.6-Trichlorophenol	M14-Jl19155	CP	%	71			30-130	Pass	
2.6-Dichlorophenol	M14-Jl19155	CP	%	72			30-130	Pass	
4-Chloro-3-methylphenol	M14-Jl19155	CP	%	78			30-130	Pass	
Pentachlorophenol	M14-Jl19155	CP	%	50			30-130	Pass	
Tetrachlorophenols - Total	M14-Jl19155	CP	%	67			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	M14-Jl19155	CP	%	46			30-130	Pass	
2-Methyl-4.6-dinitrophenol	M14-Jl19155	CP	%	41			30-130	Pass	
2-Methylphenol (o-Cresol)	M14-Jl19155	CP	%	74			30-130	Pass	
2-Nitrophenol	M14-Jl19155	CP	%	67			30-130	Pass	
2.4-Dimethylphenol	M14-Jl19155	CP	%	64			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M14-Jl19155	CP	%	85			30-130	Pass	
4-Nitrophenol	M14-Jl19155	CP	%	56			30-130	Pass	
Dinoseb	M14-Jl19155	CP	%	31			30-130	Pass	
Phenol	M14-Jl19155	CP	%	76			30-130	Pass	
Spike - % Recovery									
				Result 1					
Cyanide (total)	M14-Jl19156	CP	%	117			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M14-Jl19157	CP	%	82			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M14-Jl19157	CP	%	112			70-130	Pass	
TRH C6-C10	M14-Jl19157	CP	%	82			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
1.1.1-Trichloroethane	M14-Jl19157	CP	%	93			70-130	Pass	
1.2-Dichlorobenzene	M14-Jl19157	CP	%	86			70-130	Pass	
1.2-Dichloroethane	M14-Jl19157	CP	%	112			70-130	Pass	
Benzene	M14-Jl19157	CP	%	111			70-130	Pass	
Ethylbenzene	M14-Jl19157	CP	%	94			70-130	Pass	
m&p-Xylenes	M14-Jl19157	CP	%	98			70-130	Pass	
o-Xylene	M14-Jl19157	CP	%	98			70-130	Pass	
Toluene	M14-Jl19157	CP	%	98			70-130	Pass	
Trichloroethene	M14-Jl19157	CP	%	88			70-130	Pass	
Xylenes - Total	M14-Jl19157	CP	%	98			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	M14-Jl19157	CP	%	125			70-130	Pass	
4.4'-DDE	M14-Jl19157	CP	%	123			70-130	Pass	
4.4'-DDT	M14-Jl19157	CP	%	90			70-130	Pass	
a-BHC	M14-Jl19157	CP	%	130			70-130	Pass	
Aldrin	M14-Jl19157	CP	%	129			70-130	Pass	
b-BHC	M14-Jl19157	CP	%	122			70-130	Pass	
d-BHC	M14-Jl19157	CP	%	130			70-130	Pass	
Dieldrin	M14-Jl19157	CP	%	103			70-130	Pass	
Endosulfan I	M14-Jl19157	CP	%	125			70-130	Pass	
Endosulfan II	M14-Jl19157	CP	%	126			70-130	Pass	

[redacted]

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	M14-Jl19157	CP	%	128			70-130	Pass	
Endrin	M14-Jl19157	CP	%	104			70-130	Pass	
Endrin aldehyde	M14-Jl19157	CP	%	126			70-130	Pass	
Endrin ketone	M14-Jl19157	CP	%	118			70-130	Pass	
g-BHC (Lindane)	M14-Jl19157	CP	%	119			70-130	Pass	
Heptachlor	M14-Jl19157	CP	%	117			70-130	Pass	
Heptachlor epoxide	M14-Jl19157	CP	%	124			70-130	Pass	
Hexachlorobenzene	M14-Jl19157	CP	%	106			70-130	Pass	
Methoxychlor	M14-Jl19157	CP	%	78			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	M14-Jl19157	CP	%	121			70-130	Pass	
Spike - % Recovery									
				Result 1					
Chromium (hexavalent)	M14-Jl19157	CP	%	86			70-130	Pass	
Fluoride	M14-Jl19157	CP	%	91			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M14-Jl19159	CP	%	104			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M14-Jl19159	CP	%	101			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Cadmium	M14-Jl19159	CP	%	84			75-125	Pass	
Chromium	M14-Jl19159	CP	%	84			75-125	Pass	
Copper	M14-Jl19159	CP	%	91			75-125	Pass	
Lead	M14-Jl19159	CP	%	80			75-125	Pass	
Mercury	M14-Jl19159	CP	%	96			70-130	Pass	
Molybdenum	M14-Jl19159	CP	%	83			75-125	Pass	
Nickel	M14-Jl19159	CP	%	81			75-125	Pass	
Silver	M14-Jl19159	CP	%	110			75-125	Pass	
Tin	M14-Jl19159	CP	%	89			75-125	Pass	
Zinc	M14-Jl19159	CP	%	83			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M14-Jl19165	CP	%	76			70-130	Pass	
Acenaphthylene	M14-Jl19165	CP	%	79			70-130	Pass	
Anthracene	M14-Jl19165	CP	%	77			70-130	Pass	
Benz(a)anthracene	M14-Jl19165	CP	%	82			70-130	Pass	
Benzo(a)pyrene	M14-Jl19165	CP	%	87			70-130	Pass	
Benzo(b&j)fluoranthene	M14-Jl19165	CP	%	79			70-130	Pass	
Benzo(g.h.i)perylene	M14-Jl19165	CP	%	79			70-130	Pass	
Benzo(k)fluoranthene	M14-Jl19165	CP	%	82			70-130	Pass	
Chrysene	M14-Jl19165	CP	%	79			70-130	Pass	
Dibenz(a.h)anthracene	M14-Jl19165	CP	%	89			70-130	Pass	
Fluoranthene	M14-Jl19165	CP	%	81			70-130	Pass	
Fluorene	M14-Jl19165	CP	%	75			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M14-Jl19165	CP	%	90			70-130	Pass	
Naphthalene	M14-Jl19165	CP	%	96			70-130	Pass	
Phenanthrene	M14-Jl19165	CP	%	74			70-130	Pass	
Pyrene	M14-Jl19165	CP	%	79			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					

[redacted]

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2-Chlorophenol	M14-Jl19165	CP	%	77			30-130	Pass	
2.4-Dichlorophenol	M14-Jl19165	CP	%	73			30-130	Pass	
2.4.5-Trichlorophenol	M14-Jl19165	CP	%	76			30-130	Pass	
2.4.6-Trichlorophenol	M14-Jl19165	CP	%	72			30-130	Pass	
2.6-Dichlorophenol	M14-Jl19165	CP	%	70			30-130	Pass	
4-Chloro-3-methylphenol	M14-Jl19165	CP	%	74			30-130	Pass	
Pentachlorophenol	M14-Jl19165	CP	%	57			30-130	Pass	
Tetrachlorophenols - Total	M14-Jl19165	CP	%	69			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	M14-Jl19165	CP	%	60			30-130	Pass	
2-Methyl-4.6-dinitrophenol	M14-Jl19165	CP	%	45			30-130	Pass	
2-Methylphenol (o-Cresol)	M14-Jl19165	CP	%	71			30-130	Pass	
2-Nitrophenol	M14-Jl19165	CP	%	67			30-130	Pass	
2.4-Dimethylphenol	M14-Jl19165	CP	%	60			30-130	Pass	
2.4-Dinitrophenol	M14-Jl19165	CP	%	61			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M14-Jl19165	CP	%	71			30-130	Pass	
4-Nitrophenol	M14-Jl19165	CP	%	70			30-130	Pass	
Dinoseb	M14-Jl19165	CP	%	40			30-130	Pass	
Phenol	M14-Jl19165	CP	%	80			30-130	Pass	
Spike - % Recovery									
				Result 1					
Cyanide (total)	M14-Jl19166	CP	%	113			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M14-Jl19167	CP	%	112			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M14-Jl19167	CP	%	112			70-130	Pass	
TRH C6-C10	M14-Jl19167	CP	%	112			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
1.1.1-Trichloroethane	M14-Jl19167	CP	%	91			70-130	Pass	
1.2-Dichlorobenzene	M14-Jl19167	CP	%	86			70-130	Pass	
1.2-Dichloroethane	M14-Jl19167	CP	%	82			70-130	Pass	
Benzene	M14-Jl19167	CP	%	76			70-130	Pass	
Ethylbenzene	M14-Jl19167	CP	%	84			70-130	Pass	
m&p-Xylenes	M14-Jl19167	CP	%	83			70-130	Pass	
o-Xylene	M14-Jl19167	CP	%	81			70-130	Pass	
Toluene	M14-Jl19167	CP	%	80			70-130	Pass	
Trichloroethene	M14-Jl19167	CP	%	77			70-130	Pass	
Xylenes - Total	M14-Jl19167	CP	%	82			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	M14-Jl19167	CP	%	122			70-130	Pass	
4.4'-DDE	M14-Jl19167	CP	%	92			70-130	Pass	
4.4'-DDT	M14-Jl19167	CP	%	80			70-130	Pass	
a-BHC	M14-Jl19167	CP	%	109			70-130	Pass	
Aldrin	M14-Jl19167	CP	%	130			70-130	Pass	
b-BHC	M14-Jl19167	CP	%	120			70-130	Pass	
d-BHC	M14-Jl19167	CP	%	124			70-130	Pass	
Dieldrin	M14-Jl19167	CP	%	126			70-130	Pass	
Endosulfan I	M14-Jl19167	CP	%	103			70-130	Pass	
Endosulfan II	M14-Jl19167	CP	%	111			70-130	Pass	

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Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	M14-Jl19167	CP	%	110			70-130	Pass	
Endrin	M14-Jl19167	CP	%	80			70-130	Pass	
Endrin aldehyde	M14-Jl19167	CP	%	108			70-130	Pass	
Endrin ketone	M14-Jl19167	CP	%	107			70-130	Pass	
g-BHC (Lindane)	M14-Jl19167	CP	%	127			70-130	Pass	
Heptachlor	M14-Jl19167	CP	%	89			70-130	Pass	
Heptachlor epoxide	M14-Jl19167	CP	%	112			70-130	Pass	
Hexachlorobenzene	M14-Jl19167	CP	%	110			70-130	Pass	
Methoxychlor	M14-Jl19167	CP	%	83			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	M14-Jl19167	CP	%	123			70-130	Pass	
Spike - % Recovery									
				Result 1					
Fluoride	M14-Jl19167	CP	%	77			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M14-Jl19170	CP	%	120			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M14-Jl19170	CP	%	115			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Mercury	M14-Jl19170	CP	%	104			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M14-Jl19176	CP	%	84			70-130	Pass	
Acenaphthylene	M14-Jl19176	CP	%	85			70-130	Pass	
Anthracene	M14-Jl19176	CP	%	95			70-130	Pass	
Benz(a)anthracene	M14-Jl19176	CP	%	82			70-130	Pass	
Benzo(a)pyrene	M14-Jl19176	CP	%	85			70-130	Pass	
Benzo(b&j)fluoranthene	M14-Jl19176	CP	%	83			70-130	Pass	
Benzo(g.h.i)perylene	M14-Jl19176	CP	%	78			70-130	Pass	
Benzo(k)fluoranthene	M14-Jl19176	CP	%	101			70-130	Pass	
Chrysene	M14-Jl19176	CP	%	87			70-130	Pass	
Dibenz(a.h)anthracene	M14-Jl19176	CP	%	79			70-130	Pass	
Fluoranthene	M14-Jl19176	CP	%	77			70-130	Pass	
Fluorene	M14-Jl19176	CP	%	84			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M14-Jl19176	CP	%	79			70-130	Pass	
Naphthalene	M14-Jl19176	CP	%	83			70-130	Pass	
Phenanthrene	M14-Jl19176	CP	%	84			70-130	Pass	
Pyrene	M14-Jl19176	CP	%	78			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	M14-Jl19176	CP	%	71			30-130	Pass	
2.4-Dichlorophenol	M14-Jl19176	CP	%	87			30-130	Pass	
2.4.5-Trichlorophenol	M14-Jl19176	CP	%	91			30-130	Pass	
2.4.6-Trichlorophenol	M14-Jl19176	CP	%	71			30-130	Pass	
2.6-Dichlorophenol	M14-Jl19176	CP	%	81			30-130	Pass	
4-Chloro-3-methylphenol	M14-Jl19176	CP	%	82			30-130	Pass	
Pentachlorophenol	M14-Jl19176	CP	%	36			30-130	Pass	
Tetrachlorophenols - Total	M14-Jl19176	CP	%	72			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					

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Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2-Methyl-4.6-dinitrophenol	M14-Jl19176	CP	%	31			30-130	Pass	
2-Methylphenol (o-Cresol)	M14-Jl19176	CP	%	82			30-130	Pass	
2-Nitrophenol	M14-Jl19176	CP	%	80			30-130	Pass	
2.4-Dimethylphenol	M14-Jl19176	CP	%	71			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M14-Jl19176	CP	%	84			30-130	Pass	
4-Nitrophenol	M14-Jl19176	CP	%	78			30-130	Pass	
Dinoseb	M14-Jl19176	CP	%	34			30-130	Pass	
Phenol	M14-Jl19176	CP	%	80			30-130	Pass	
Spike - % Recovery									
				Result 1					
Cyanide (total)	M14-Jl19177	CP	%	102			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Glycols				Result 1	Result 2	RPD			
Di-Ethylene Glycol*	M14-Jl19143	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Ethylene glycol*	M14-Jl19143	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Propylene glycol*	M14-Jl19143	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Triethylene glycol*	M14-Jl19143	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
PFOS/PFOA/6:2FTS				Result 1	Result 2	RPD			
Perfluorooctanesulfonic acid (PFOS)	M14-Jl19143	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M14-Jl19143	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctansulfonic acid (6:2 FTS)	M14-Jl19143	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	M14-Jl19144	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	M14-Jl19144	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	M14-Jl19144	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	M14-Jl19144	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	M14-Jl19144	CP	mg/kg	< 1	< 1	<1	30%	Pass	

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Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M14-Jl19144	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M14-Jl19144	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M14-Jl19144	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	M14-Jl19144	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	M14-Jl19144	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M14-Jl19144	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	M14-Jl19144	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	M14-Jl19144	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	M14-Jl19144	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Cyanide (total)	M14-Jl19145	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M14-Jl19146	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M14-Jl19146	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M14-Jl19146	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C6-C10 less BTEX (F1)	M14-Jl19146	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.2.4-Trichlorobenzene	M14-Jl19146	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Hexachlorobutadiene	M14-Jl19146	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
1.1-Dichloroethane	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1-Dichloroethene	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.1-Trichloroethane	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.2-Trichloroethane	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dibromoethane	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dichlorobenzene	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dichloroethane	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dichloropropane	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2.3-Trichloropropane	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2.4-Trimethylbenzene	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.3-Dichlorobenzene	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.3-Dichloropropane	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.3.5-Trimethylbenzene	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.4-Dichlorobenzene	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
2-Butanone (MEK)	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
2-Propanone (Acetone)	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4-Chlorotoluene	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Allyl chloride	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Benzene	M14-Jl19146	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Bromobenzene	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Bromochloromethane	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Bromodichloromethane	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Bromoform	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Bromomethane	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Carbon disulfide	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Carbon Tetrachloride	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

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Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
Chlorobenzene	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Chloroethane	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Chloroform	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Chloromethane	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
cis-1.2-Dichloroethene	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
cis-1.3-Dichloropropene	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dibromochloromethane	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dibromomethane	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dichlorodifluoromethane	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Ethylbenzene	M14-Jl19146	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Iodomethane	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Isopropyl benzene (Cumene)	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
m&p-Xylenes	M14-Jl19146	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methylene Chloride	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
o-Xylene	M14-Jl19146	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Styrene	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Tetrachloroethene	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toluene	M14-Jl19146	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
trans-1.2-Dichloroethene	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
trans-1.3-Dichloropropene	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Trichloroethene	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Trichlorofluoromethane	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Vinyl chloride	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Xylenes - Total	M14-Jl19146	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M14-Jl19146	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M14-Jl19146	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M14-Jl19146	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M14-Jl19146	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	M14-Jl19146	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	M14-Jl19146	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	M14-Jl19146	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	M14-Jl19146	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	

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Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1254	M14-Jl19146	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	M14-Jl19146	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB	M14-Jl19146	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	M14-Jl19146	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M14-Jl19148	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M14-Jl19148	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M14-Jl19148	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M14-Jl19148	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M14-Jl19148	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M14-Jl19148	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M14-Jl19149	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	M14-Jl19149	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M14-Jl19149	CP	mg/kg	20	20	3.0	30%	Pass	
Copper	M14-Jl19149	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	M14-Jl19149	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Mercury	M14-Jl19149	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M14-Jl19149	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Nickel	M14-Jl19149	CP	mg/kg	6.4	6.4	<1	30%	Pass	
Selenium	M14-Jl19149	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M14-Jl19149	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Tin	M14-Jl19149	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M14-Jl19149	CP	mg/kg	7.4	8.5	14	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	M14-Jl19154	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	M14-Jl19154	CP	mg/kg	< 1	< 1	<1	30%	Pass	

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Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2.6-Dichlorophenol	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	M14-Jl19154	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	M14-Jl19154	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	M14-Jl19154	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M14-Jl19154	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M14-Jl19154	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M14-Jl19154	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	M14-Jl19154	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	M14-Jl19154	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M14-Jl19154	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	M14-Jl19154	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	M14-Jl19154	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	M14-Jl19154	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Cyanide (total)	M14-Jl19155	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M14-Jl19156	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M14-Jl19156	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M14-Jl19156	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C6-C10 less BTEX (F1)	M14-Jl19156	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.2.4-Trichlorobenzene	M14-Jl19156	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Hexachlorobutadiene	M14-Jl19156	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
1.1-Dichloroethane	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1-Dichloroethene	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.1-Trichloroethane	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.2-Trichloroethane	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dibromoethane	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dichlorobenzene	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dichloroethane	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dichloropropane	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2.3-Trichloropropane	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2.4-Trimethylbenzene	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.3-Dichlorobenzene	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.3-Dichloropropane	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.3.5-Trimethylbenzene	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.4-Dichlorobenzene	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
2-Butanone (MEK)	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
2-Propanone (Acetone)	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4-Chlorotoluene	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Allyl chloride	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Benzene	M14-Jl19156	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Bromobenzene	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

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Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
Bromochloromethane	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Bromodichloromethane	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Bromoform	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Bromomethane	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Carbon disulfide	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Carbon Tetrachloride	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Chlorobenzene	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Chloroethane	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Chloroform	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Chloromethane	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
cis-1.2-Dichloroethene	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
cis-1.3-Dichloropropene	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dibromochloromethane	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dibromomethane	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dichlorodifluoromethane	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Ethylbenzene	M14-Jl19156	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Iodomethane	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Isopropyl benzene (Cumene)	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
m&p-Xylenes	M14-Jl19156	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methylene Chloride	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
o-Xylene	M14-Jl19156	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Styrene	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Tetrachloroethene	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toluene	M14-Jl19156	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
trans-1.2-Dichloroethene	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
trans-1.3-Dichloropropene	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Trichloroethene	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Trichlorofluoromethane	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Vinyl chloride	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Xylenes - Total	M14-Jl19156	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M14-Jl19156	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M14-Jl19156	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M14-Jl19156	CP	mg/kg	< 1	< 1	<1	30%	Pass	

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Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M14-Jl19156	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	M14-Jl19156	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	M14-Jl19156	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	M14-Jl19156	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	M14-Jl19156	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	M14-Jl19156	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	M14-Jl19156	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB	M14-Jl19156	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	M14-Jl19156	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Fluoride	M14-Jl19156	CP	mg/kg	160	170	4.5	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M14-Jl19158	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M14-Jl19158	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M14-Jl19158	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M14-Jl19158	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M14-Jl19158	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M14-Jl19158	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M14-Jl19159	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	M14-Jl19159	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M14-Jl19159	CP	mg/kg	27	28	1.0	30%	Pass	
Copper	M14-Jl19159	CP	mg/kg	8.4	8.5	2.0	30%	Pass	
Lead	M14-Jl19159	CP	mg/kg	6.2	5.9	4.0	30%	Pass	
Mercury	M14-Jl19159	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M14-Jl19159	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Nickel	M14-Jl19159	CP	mg/kg	13	13	1.0	30%	Pass	
Selenium	M14-Jl19159	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M14-Jl19159	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Tin	M14-Jl19159	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M14-Jl19159	CP	mg/kg	10	9.6	5.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

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Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	M14-Jl19164	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	M14-Jl19164	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	M14-Jl19164	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	M14-Jl19164	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	M14-Jl19164	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M14-Jl19164	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M14-Jl19164	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M14-Jl19164	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	M14-Jl19164	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	M14-Jl19164	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M14-Jl19164	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	M14-Jl19164	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	M14-Jl19164	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	M14-Jl19164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Cyanide (total)	M14-Jl19165	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M14-Jl19166	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M14-Jl19166	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M14-Jl19166	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C6-C10 less BTEX (F1)	M14-Jl19166	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.2.4-Trichlorobenzene	M14-Jl19166	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Hexachlorobutadiene	M14-Jl19166	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
1.1-Dichloroethane	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1-Dichloroethene	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.1-Trichloroethane	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.2-Trichloroethane	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dibromoethane	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dichlorobenzene	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dichloroethane	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dichloropropane	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2.3-Trichloropropane	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2.4-Trimethylbenzene	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.3-Dichlorobenzene	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.3-Dichloropropane	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.3.5-Trimethylbenzene	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.4-Dichlorobenzene	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
2-Butanone (MEK)	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
2-Propanone (Acetone)	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4-Chlorotoluene	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

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Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
4-Methyl-2-pentanone (MIBK)	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Allyl chloride	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Benzene	M14-Jl19166	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Bromobenzene	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Bromochloromethane	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Bromodichloromethane	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Bromoform	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Bromomethane	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Carbon disulfide	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Carbon Tetrachloride	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Chlorobenzene	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Chloroethane	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Chloroform	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Chloromethane	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
cis-1.2-Dichloroethene	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
cis-1.3-Dichloropropene	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dibromochloromethane	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dibromomethane	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dichlorodifluoromethane	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Ethylbenzene	M14-Jl19166	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Iodomethane	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Isopropyl benzene (Cumene)	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
m&p-Xylenes	M14-Jl19166	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methylene Chloride	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
o-Xylene	M14-Jl19166	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Styrene	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Tetrachloroethene	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toluene	M14-Jl19166	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
trans-1.2-Dichloroethene	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
trans-1.3-Dichloropropene	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Trichloroethene	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Trichlorofluoromethane	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Vinyl chloride	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Xylenes - Total	M14-Jl19166	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M14-Jl19166	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

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Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Hexachlorobenzene	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M14-Jl19166	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M14-Jl19166	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M14-Jl19166	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	M14-Jl19166	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	M14-Jl19166	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	M14-Jl19166	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	M14-Jl19166	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	M14-Jl19166	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	M14-Jl19166	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB	M14-Jl19166	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	M14-Jl19166	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Fluoride	M14-Jl19166	CP	mg/kg	280	250	13	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M14-Jl19169	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M14-Jl19169	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M14-Jl19169	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M14-Jl19169	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M14-Jl19169	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M14-Jl19169	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M14-Jl19170	CP	mg/kg	15	14	4.0	30%	Pass	
Cadmium	M14-Jl19170	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M14-Jl19170	CP	mg/kg	74	74	<1	30%	Pass	
Copper	M14-Jl19170	CP	mg/kg	30	31	1.0	30%	Pass	
Lead	M14-Jl19170	CP	mg/kg	< 5	5.1	9.0	30%	Pass	
Mercury	M14-Jl19170	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M14-Jl19170	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Nickel	M14-Jl19170	CP	mg/kg	94	95	<1	30%	Pass	
Selenium	M14-Jl19170	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M14-Jl19170	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Tin	M14-Jl19170	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M14-Jl19170	CP	mg/kg	33	32	1.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

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Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Fluorene	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	M14-Jl19175	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	M14-Jl19175	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	M14-Jl19175	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	M14-Jl19175	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	M14-Jl19175	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M14-Jl19175	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M14-Jl19175	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M14-Jl19175	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	M14-Jl19175	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	M14-Jl19175	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M14-Jl19175	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	M14-Jl19175	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	M14-Jl19175	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	M14-Jl19175	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Cyanide (total)	M14-Jl19176	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M14-Jl19177	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M14-Jl19177	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M14-Jl19177	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C6-C10 less BTEX (F1)	M14-Jl19177	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.2.4-Trichlorobenzene	M14-Jl19177	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Hexachlorobutadiene	M14-Jl19177	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
1.1-Dichloroethane	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1-Dichloroethene	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.1-Trichloroethane	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.2-Trichloroethane	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dibromoethane	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dichlorobenzene	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dichloroethane	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dichloropropane	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2.3-Trichloropropane	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2.4-Trimethylbenzene	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

[redacted]

Duplicate								
Volatile Organics				Result 1	Result 2	RPD		
1.3-Dichlorobenzene	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
1.3-Dichloropropane	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
1.3.5-Trimethylbenzene	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
1.4-Dichlorobenzene	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
2-Butanone (MEK)	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
2-Propanone (Acetone)	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4-Chlorotoluene	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4-Methyl-2-pentanone (MIBK)	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Allyl chloride	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Benzene	M14-Jl19177	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Bromobenzene	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Bromochloromethane	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Bromodichloromethane	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Bromoform	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Bromomethane	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Carbon disulfide	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Carbon Tetrachloride	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Chlorobenzene	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Chloroethane	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Chloroform	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Chloromethane	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
cis-1.2-Dichloroethene	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
cis-1.3-Dichloropropene	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dibromochloromethane	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dibromomethane	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dichlorodifluoromethane	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Ethylbenzene	M14-Jl19177	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Iodomethane	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Isopropyl benzene (Cumene)	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
m&p-Xylenes	M14-Jl19177	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Methylene Chloride	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
o-Xylene	M14-Jl19177	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Styrene	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Tetrachloroethene	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Toluene	M14-Jl19177	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
trans-1.2-Dichloroethene	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
trans-1.3-Dichloropropene	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Trichloroethene	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Trichlorofluoromethane	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Vinyl chloride	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Xylenes - Total	M14-Jl19177	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass
Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Chlordanes - Total	M14-Jl19177	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
4.4'-DDD	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4.4'-DDE	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4.4'-DDT	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
a-BHC	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Aldrin	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
b-BHC	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
d-BHC	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dieldrin	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan I	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan II	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass

[redacted]

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Endosulfan sulphate	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M14-Jl19177	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M14-Jl19177	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M14-Jl19177	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	M14-Jl19177	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	M14-Jl19177	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	M14-Jl19177	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	M14-Jl19177	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	M14-Jl19177	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	M14-Jl19177	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB	M14-Jl19177	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	

[redacted]

Comments

Sample Integrity

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

Qualifier Codes/Comments

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

Authorised By

[redacted]

Client Services
Senior Analyst-Volatile (VIC)
Senior Analyst-Metal (VIC)
Senior Analyst-Inorganic (VIC)
Senior Analyst-Organic (QLD)
Senior Analyst-Organic (VIC)

Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

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[redacted]

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
PFOS/PFOA/6:2FTS	Brisbane	Jul 28, 2014	14 Day
- Method: LTM-ORG-2100 Determination of PFCs in aqueous and soil samples by LC-MS/MS			
AUS Leaching Procedure			
pH (Leachate fluid)	Melbourne	Jul 23, 2014	0 Day
pH (off)	Melbourne	Jul 23, 2014	0 Day

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NATA # 1261 Site # 18217

Brisbane
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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Client Job No.: TAXIWAY ZULU

Order No.:
Report #: 425883
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Jul 22, 2014 10:59 AM
Due: Jul 29, 2014
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Client Manager: [redacted]

Sample Detail					% Moisture	TRH C10-C14	TRH C15-C28	TRH C29-C36	TRH C36+	Polycyclic Aromatic Hydrocarbons	Glycols	Australian Standard Leaching Procedure (ASLP)	Phenols (IWRG 621)	PFOS/PFOA/6:2FTS	Vic EPA IWRG 621 (Solids)
Laboratory where analysis is conducted															
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	X	X	X	X	X	X		X
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794														X	
External Laboratory															
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
TP01 0.3	Jul 17, 2014		Soil	M14-Jl19143	X						X			X	X
TP01 1.0	Jul 17, 2014		Soil	M14-Jl19144	X										X
TP02 0.3	Jul 17, 2014		Soil	M14-Jl19145	X						X				X
TP02 1.0	Jul 17, 2014		Soil	M14-Jl19146	X										X
TP03 0.3	Jul 17, 2014		Soil	M14-Jl19147	X									X	X
TP03 1.0	Jul 17, 2014		Soil	M14-Jl19148	X										X
TP04 0.3	Jul 17, 2014		Soil	M14-Jl19149	X						X				X
TP04 1.0	Jul 17, 2014		Soil	M14-Jl19150	X										X
TP05 0.3	Jul 17, 2014		Soil	M14-Jl19151	X						X			X	X
TP05 1.0	Jul 17, 2014		Soil	M14-Jl19152	X										X

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Laboratory where analysis is conducted															
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	X	X	X	X	X	X		X
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794														X	
External Laboratory															
TP06 0.3	Jul 17, 2014		Soil	M14-Jl19153	X						X				X
TP06 1.0	Jul 17, 2014		Soil	M14-Jl19154	X										X
TP07 0.3	Jul 17, 2014		Soil	M14-Jl19155	X						X				X
TP07 1.0	Jul 17, 2014		Soil	M14-Jl19156	X										X
TP08 0.3	Jul 17, 2014		Soil	M14-Jl19157	X						X			X	X
TP08 1.0	Jul 17, 2014		Soil	M14-Jl19158	X										X
TP09 0.3	Jul 17, 2014		Soil	M14-Jl19159	X						X				X
TP09 1.0	Jul 17, 2014		Soil	M14-Jl19160	X										X
TP10 0.3	Jul 17, 2014		Soil	M14-Jl19161	X									X	X
TP010 1.0	Jul 17, 2014		Soil	M14-Jl19162	X										X
TP012 0.3	Jul 17, 2014		Soil	M14-Jl19163	X						X			X	X

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Laboratory where analysis is conducted															
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	X	X	X	X	X	X		X
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794														X	
External Laboratory															
TP012 1.0	Jul 17, 2014		Soil	M14-Jl19164	X										X
TP013 0.3	Jul 17, 2014		Soil	M14-Jl19165	X						X			X	X
TP013 1.0	Jul 17, 2014		Soil	M14-Jl19166	X										X
TP014 0.3	Jul 17, 2014		Soil	M14-Jl19167	X									X	X
TP015 0.3	Jul 17, 2014		Soil	M14-Jl19169	X						X				X
TP015 1.0	Jul 17, 2014		Soil	M14-Jl19170	X										X
TP016 0.3	Jul 17, 2014		Soil	M14-Jl19171	X									X	X
TP016 1.0	Jul 17, 2014		Soil	M14-Jl19172	X										X
TP017 0.3	Jul 17, 2014		Soil	M14-Jl19173	X									X	X
TP017 1.0	Jul 17, 2014		Soil	M14-Jl19174	X										X
TP018 0.3	Jul 17, 2014		Soil	M14-Jl19175	X						X				X

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Sample Detail					% Moisture	TRH C10-C14	TRH C15-C28	TRH C29-C36	TRH C36+	Polycyclic Aromatic Hydrocarbons	Glycols	Australian Standard Leaching Procedure (ASLP)	Phenols (IWRG 621)	PFOS/PFOA/6:2FTS	Vic EPA IWRG 621 (Solids)
Laboratory where analysis is conducted															
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	X	X	X	X	X	X		X
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794														X	
External Laboratory															
TP018 1.0	Jul 17, 2014		Soil	M14-Jl19176	X										X
QA1	Jul 17, 2014		Soil	M14-Jl19177	X						X			X	X
QA3	Jul 17, 2014		Soil	M14-Jl19178	X						X			X	X
RINSATE 1	Jul 15, 2014		Water	M14-Jl19179		X	X	X	X	X			X		
RINSATE 2	Jul 16, 2014		Water	M14-Jl19180		X	X	X	X	X			X		
RINSATE 3	Jul 17, 2014		Water	M14-Jl19181		X	X	X	X	X			X		
TP01 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19182	X							X		X	
TP03 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19183	X							X		X	
TP05 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19184	X							X		X	
TP08 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19185	X							X		X	
TP10 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19186	X							X		X	

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Sample Detail					% Moisture	TRH C10-C14	TRH C15-C28	TRH C29-C36	TRH C36+	Polycyclic Aromatic Hydrocarbons	Glycols	Australian Standard Leaching Procedure (ASLP)	Phenols (IWRG 621)	PFOS/PFOA/6:2FTS	Vic EPA IWRG 621 (Solids)
Laboratory where analysis is conducted															
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	X	X	X	X	X	X		X
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794														X	
External Laboratory															
TP12 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19187	X							X		X	
TP13 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19188	X							X		X	
TP14 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19189	X							X		X	
TP16 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19190	X							X		X	
TP17 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19191	X							X		X	

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. 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 Acknowledgment.

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: 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. 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.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
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USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
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 20-130%.

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, Toxophene & Chlordane are not added to the LCS.
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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 Arochlor 1260 in Matrix Spikes and LCS's.
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 RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

[redacted]

Quality Control Results

[redacted]

Comments

Sample Integrity

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

Qualifier Codes/Comments

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

Authorised By

[redacted]

Client Services
Senior Analyst-Organic (QLD)

Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

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.

[redacted]

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	Melbourne	Jul 22, 2014	7 Day
- Method: TRH C6-C36 - MGT 100A			
Vic EPA IWRG 621 (Solids)			
Polycyclic Aromatic Hydrocarbons	Melbourne	Jul 22, 2014	7 Day
- Method: USEPA 8270 Polycyclic Aromatic Hydrocarbons			
Phenols (Halogenated)	Melbourne	Jul 22, 2014	7 Day
- Method: USEPA 8270 Phenols			
Phenols (non-Halogenated)	Melbourne	Jul 22, 2014	7 Day
- Method: USEPA 8270 Phenols			

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NATA # 1261 Site # 20794

Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Client Job No.: TAXIWAY ZULU

Order No.:
Report #: 425883
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Jul 22, 2014 10:59 AM
Due: Jul 29, 2014
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Client Manager: [redacted]

Sample Detail					% Moisture	TRH C10-C14	TRH C15-C28	TRH C29-C36	TRH C36+	Polycyclic Aromatic Hydrocarbons	Glycols	Australian Standard Leaching Procedure (ASLP)	Phenols (IWRG 621)	PFOS/PFOA/6:2FTS	Vic EPA IWRG 621 (Solids)
Laboratory where analysis is conducted															
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	X	X	X	X	X	X		X
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794														X	
External Laboratory															
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
TP01 0.3	Jul 17, 2014		Soil	M14-Jl19143	X						X			X	X
TP01 1.0	Jul 17, 2014		Soil	M14-Jl19144	X										X
TP02 0.3	Jul 17, 2014		Soil	M14-Jl19145	X						X				X
TP02 1.0	Jul 17, 2014		Soil	M14-Jl19146	X										X
TP03 0.3	Jul 17, 2014		Soil	M14-Jl19147	X									X	X
TP03 1.0	Jul 17, 2014		Soil	M14-Jl19148	X										X
TP04 0.3	Jul 17, 2014		Soil	M14-Jl19149	X						X				X
TP04 1.0	Jul 17, 2014		Soil	M14-Jl19150	X										X
TP05 0.3	Jul 17, 2014		Soil	M14-Jl19151	X						X			X	X
TP05 1.0	Jul 17, 2014		Soil	M14-Jl19152	X										X

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Laboratory where analysis is conducted															
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	X	X	X	X	X	X		X
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794														X	
External Laboratory															
TP06 0.3	Jul 17, 2014		Soil	M14-Jl19153	X						X				X
TP06 1.0	Jul 17, 2014		Soil	M14-Jl19154	X										X
TP07 0.3	Jul 17, 2014		Soil	M14-Jl19155	X						X				X
TP07 1.0	Jul 17, 2014		Soil	M14-Jl19156	X										X
TP08 0.3	Jul 17, 2014		Soil	M14-Jl19157	X						X			X	X
TP08 1.0	Jul 17, 2014		Soil	M14-Jl19158	X										X
TP09 0.3	Jul 17, 2014		Soil	M14-Jl19159	X						X				X
TP09 1.0	Jul 17, 2014		Soil	M14-Jl19160	X										X
TP10 0.3	Jul 17, 2014		Soil	M14-Jl19161	X									X	X
TP010 1.0	Jul 17, 2014		Soil	M14-Jl19162	X										X
TP012 0.3	Jul 17, 2014		Soil	M14-Jl19163	X						X			X	X

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Laboratory where analysis is conducted															
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	X	X	X	X	X	X		X
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794														X	
External Laboratory															
TP012 1.0	Jul 17, 2014		Soil	M14-Jl19164	X										X
TP013 0.3	Jul 17, 2014		Soil	M14-Jl19165	X						X			X	X
TP013 1.0	Jul 17, 2014		Soil	M14-Jl19166	X										X
TP014 0.3	Jul 17, 2014		Soil	M14-Jl19167	X									X	X
TP015 0.3	Jul 17, 2014		Soil	M14-Jl19169	X						X				X
TP015 1.0	Jul 17, 2014		Soil	M14-Jl19170	X										X
TP016 0.3	Jul 17, 2014		Soil	M14-Jl19171	X									X	X
TP016 1.0	Jul 17, 2014		Soil	M14-Jl19172	X										X
TP017 0.3	Jul 17, 2014		Soil	M14-Jl19173	X									X	X
TP017 1.0	Jul 17, 2014		Soil	M14-Jl19174	X										X
TP018 0.3	Jul 17, 2014		Soil	M14-Jl19175	X						X				X

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Laboratory where analysis is conducted															
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Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794														X	
External Laboratory															
TP018 1.0	Jul 17, 2014		Soil	M14-Jl19176	X										X
QA1	Jul 17, 2014		Soil	M14-Jl19177	X						X			X	X
QA3	Jul 17, 2014		Soil	M14-Jl19178	X						X			X	X
RINSATE 1	Jul 15, 2014		Water	M14-Jl19179		X	X	X	X	X			X		
RINSATE 2	Jul 16, 2014		Water	M14-Jl19180		X	X	X	X	X			X		
RINSATE 3	Jul 17, 2014		Water	M14-Jl19181		X	X	X	X	X			X		
TP01 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19182	X							X		X	
TP03 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19183	X							X		X	
TP05 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19184	X							X		X	
TP08 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19185	X							X		X	
TP10 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19186	X							X		X	

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TP14 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19189	X							X		X	
TP16 0.3	Jul 17, 2014		ASLP - pH 5.0	M14-Jl19190	X							X		X	
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TERMS

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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 Arochlor 1260 in Matrix Spikes and LCS's.
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 RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

[redacted]

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
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							
Phenols (Halogenated)							
2-Chlorophenol	mg/L	< 0.003			0.003	Pass	
2.4-Dichlorophenol	mg/L	< 0.003			0.003	Pass	
2.4.5-Trichlorophenol	mg/L	< 0.01			0.01	Pass	
2.4.6-Trichlorophenol	mg/L	< 0.01			0.01	Pass	
2.6-Dichlorophenol	mg/L	< 0.003			0.003	Pass	
4-Chloro-3-methylphenol	mg/L	< 0.01			0.01	Pass	
Pentachlorophenol	mg/L	< 0.01			0.01	Pass	
Tetrachlorophenols - Total	mg/L	< 0.03			0.03	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/L	< 0.1			0.1	Pass	
2-Methyl-4.6-dinitrophenol	mg/L	< 0.03			0.03	Pass	
2-Methylphenol (o-Cresol)	mg/L	< 0.003			0.003	Pass	
2-Nitrophenol	mg/L	< 0.01			0.01	Pass	
2.4-Dimethylphenol	mg/L	< 0.003			0.003	Pass	
2.4-Dinitrophenol	mg/L	< 0.03			0.03	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/L	< 0.006			0.006	Pass	
4-Nitrophenol	mg/L	< 0.03			0.03	Pass	
Dinoseb	mg/L	< 0.1			0.1	Pass	
Phenol	mg/L	< 0.003			0.003	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C10-C14	%	91			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	100			70-130	Pass	
Acenaphthylene	%	103			70-130	Pass	

[redacted]

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Anthracene	%	100			70-130	Pass	
Benz(a)anthracene	%	107			70-130	Pass	
Benzo(a)pyrene	%	122			70-130	Pass	
Benzo(b&j)fluoranthene	%	109			70-130	Pass	
Benzo(g.h.i)perylene	%	87			70-130	Pass	
Benzo(k)fluoranthene	%	121			70-130	Pass	
Chrysene	%	107			70-130	Pass	
Dibenz(a.h)anthracene	%	96			70-130	Pass	
Fluoranthene	%	107			70-130	Pass	
Fluorene	%	101			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	95			70-130	Pass	
Naphthalene	%	98			70-130	Pass	
Phenanthrene	%	98			70-130	Pass	
Pyrene	%	106			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	111			30-130	Pass	
2.4-Dichlorophenol	%	113			30-130	Pass	
2.4.5-Trichlorophenol	%	110			30-130	Pass	
2.4.6-Trichlorophenol	%	111			30-130	Pass	
2.6-Dichlorophenol	%	111			30-130	Pass	
4-Chloro-3-methylphenol	%	112			30-130	Pass	
Pentachlorophenol	%	88			30-130	Pass	
Tetrachlorophenols - Total	%	94			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	70			30-130	Pass	
2-Methyl-4.6-dinitrophenol	%	76			30-130	Pass	
2-Methylphenol (o-Cresol)	%	92			30-130	Pass	
2-Nitrophenol	%	113			30-130	Pass	
2.4-Dimethylphenol	%	107			30-130	Pass	
2.4-Dinitrophenol	%	42			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	85			30-130	Pass	
4-Nitrophenol	%	41			30-130	Pass	
Dinoseb	%	83			30-130	Pass	
Phenol	%	45			30-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M14-Jl19180	CP	%	104			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M14-Jl19181	CP	%	74			70-130	Pass	
Acenaphthylene	M14-Jl19181	CP	%	73			70-130	Pass	
Anthracene	M14-Jl19181	CP	%	74			70-130	Pass	
Benz(a)anthracene	M14-Jl19181	CP	%	75			70-130	Pass	
Benzo(a)pyrene	M14-Jl19181	CP	%	81			70-130	Pass	
Benzo(b&j)fluoranthene	M14-Jl19181	CP	%	78			70-130	Pass	
Benzo(g.h.i)perylene	M14-Jl19181	CP	%	76			70-130	Pass	
Benzo(k)fluoranthene	M14-Jl19181	CP	%	92			70-130	Pass	
Chrysene	M14-Jl19181	CP	%	77			70-130	Pass	
Dibenz(a.h)anthracene	M14-Jl19181	CP	%	85			70-130	Pass	
Fluoranthene	M14-Jl19181	CP	%	76			70-130	Pass	
Fluorene	M14-Jl19181	CP	%	76			70-130	Pass	

[redacted]

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Indeno(1.2.3-cd)pyrene	M14-Jl19181	CP	%	84			70-130	Pass	
Naphthalene	M14-Jl19181	CP	%	72			70-130	Pass	
Phenanthrene	M14-Jl19181	CP	%	75			70-130	Pass	
Pyrene	M14-Jl19181	CP	%	76			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	M14-Jl19181	CP	%	75			30-130	Pass	
2.4-Dichlorophenol	M14-Jl19181	CP	%	77			30-130	Pass	
2.4.5-Trichlorophenol	M14-Jl19181	CP	%	77			30-130	Pass	
2.4.6-Trichlorophenol	M14-Jl19181	CP	%	77			30-130	Pass	
2.6-Dichlorophenol	M14-Jl19181	CP	%	77			30-130	Pass	
4-Chloro-3-methylphenol	M14-Jl19181	CP	%	78			30-130	Pass	
Pentachlorophenol	M14-Jl19181	CP	%	65			30-130	Pass	
Tetrachlorophenols - Total	M14-Jl19181	CP	%	66			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	M14-Jl19181	CP	%	42			30-130	Pass	
2-Methyl-4.6-dinitrophenol	M14-Jl19181	CP	%	52			30-130	Pass	
2-Methylphenol (o-Cresol)	M14-Jl19181	CP	%	64			30-130	Pass	
2-Nitrophenol	M14-Jl19181	CP	%	77			30-130	Pass	
2.4-Dimethylphenol	M14-Jl19181	CP	%	60			30-130	Pass	
2.4-Dinitrophenol	M14-Jl19181	CP	%	83			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M14-Jl19181	CP	%	59			30-130	Pass	
4-Nitrophenol	M14-Jl19181	CP	%	35			30-130	Pass	
Dinoseb	M14-Jl19181	CP	%	53			30-130	Pass	
Phenol	M14-Jl19181	CP	%	34			30-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M14-Jl19179	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M14-Jl19179	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M14-Jl19179	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M14-Jl19179	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M14-Jl19179	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M14-Jl19179	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M14-Jl19179	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M14-Jl19179	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M14-Jl19179	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	M14-Jl19179	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M14-Jl19179	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	M14-Jl19179	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	M14-Jl19179	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	M14-Jl19179	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M14-Jl19179	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M14-Jl19179	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	M14-Jl19179	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	M14-Jl19179	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	M14-Jl19179	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

[redacted]

Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M14-Jl19179	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4-Dichlorophenol	M14-Jl19179	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4.5-Trichlorophenol	M14-Jl19179	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.4.6-Trichlorophenol	M14-Jl19179	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.6-Dichlorophenol	M14-Jl19179	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
4-Chloro-3-methylphenol	M14-Jl19179	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Pentachlorophenol	M14-Jl19179	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Tetrachlorophenols - Total	M14-Jl19179	CP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M14-Jl19179	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M14-Jl19179	CP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M14-Jl19179	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2-Nitrophenol	M14-Jl19179	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.4-Dimethylphenol	M14-Jl19179	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4-Dinitrophenol	M14-Jl19179	CP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M14-Jl19179	CP	mg/L	< 0.006	< 0.006	<1	30%	Pass	
4-Nitrophenol	M14-Jl19179	CP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
Dinoseb	M14-Jl19179	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Phenol	M14-Jl19179	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

[redacted]

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
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

[redacted]

Client Services
Senior Analyst-Organic (VIC)

Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

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Site # 1254 & 14271

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NATA # 1261 Site # 18217

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

Sample Receipt Advice

Company name: Jacobs Group (Australia) P/L VIC

Contact name: [redacted]
Client job number: TAXIWAY ZULU SB20500.010
COC number: Not provided
Turn around time: 5 Day
Date/Time received: Jul 22, 2014 10:59 AM
Eurofins | mgt reference: 425883

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.

☑ Organic samples had Teflon liners.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

TP14 1.0 WAS NOT RECEIVED, NO RECORD OF IT ON ANY OF THE PREVIOUS SAMPLE COC'S RECEIVED WITH ESKIES

Contact notes

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

[redacted]

Results will be delivered electronically via e.mail to [redacted]

Eurofins | mgt Sample Receipt

[redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1407227**	Page	: 1 of 8
Client	: **JACOBS GROUP (AUSTRALIA) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: [redacted]	Contact	: [redacted]
Address	: P O BOX 312 FLINDERS LANE MELBOURNE VIC AUSTRALIA 8009	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Facsimile	: [redacted]	Facsimile	: [redacted]
Project	: SB20500 010 Taxiway Zulu	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 22-JUL-2014
Sampler	: [redacted]	Issue Date	: 29-JUL-2014
Site	: ----		
		No. of samples received	: 2
Quote number	: EN/003/14	No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

- **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.**
- **EG048 : EM1407121 #5 matrix spike failed for Cr6+ due to possible sample matrix interference.**

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	Position	Accreditation Category
[redacted]	Non-Metals Team Leader	Melbourne Inorganics
	Senior Inorganic Chemist	Melbourne Inorganics
	Senior Organic Chemist	Melbourne Inorganics
		Melbourne Organics

[redacted]

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
PFOS/PFOA/6:2FTS	Brisbane	Sep 10, 2014	14 Day
- Method: LTM-ORG-2100 Determination of PFCs in aqueous and soil samples by LC-MS/MS			
AUS Leaching Procedure	Melbourne	Sep 05, 2014	7 Day
- Method: LTM-GEN-7010			

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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Client Job No.: TAXIWAY ZULU SB20500.010

Order No.:
Report #: 431001
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Sep 4, 2014 1:46 PM
Due: Sep 11, 2014
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Client Manager: [redacted]

Sample Detail					% Moisture	HOLD	AUS Leaching Procedure	PFOS/PFOA/6:2FTS
Laboratory where analysis is conducted								
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								X
External Laboratory								
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
TP37 0.3	Aug 20, 2014		Soil	M14-Se03659	X			X
TP19 0.3	Aug 22, 2014		Soil	M14-Se03660	X			X
TP25 0.3	Aug 21, 2014		Soil	M14-Se03661	X			X
TP26 0.3	Aug 21, 2014		Soil	M14-Se03662	X			X
TP22 0.3	Aug 22, 2014		Soil	M14-Se03663	X			X
TP31 0.3	Aug 22, 2014		Soil	M14-Se03664	X			X
TP34 0.3	Aug 22, 2014		Soil	M14-Se03665	X			X
TP37 0.3	Aug 20, 2014		ASLP - pH 5.0	M14-Se03666			X	X
TP19 0.3	Aug 20, 2014		ASLP - pH 5.0	M14-Se03667			X	X
TP25 0.3	Aug 20, 2014		ASLP - pH 5.0	M14-Se03668			X	X

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Company Name: Jacobs Group (Australia) P/L VIC
Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Client Job No.: TAXIWAY ZULU SB20500.010

Order No.:
Report #: 431001
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Sep 4, 2014 1:46 PM
Due: Sep 11, 2014
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Client Manager: [redacted]

Sample Detail					% Moisture	HOLD	AUS Leaching Procedure	PFOS/PFOA/6:2FTS
Laboratory where analysis is conducted								
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								X
External Laboratory								
TP26 0.3	Aug 20, 2014		ASLP - pH 5.0	M14-Se03669			X	X
TP22 0.3	Aug 20, 2014		ASLP - pH 5.0	M14-Se03670			X	X
TP31 0.3	Aug 20, 2014		ASLP - pH 5.0	M14-Se03671			X	X
TP34 0.3	Aug 20, 2014		ASLP - pH 5.0	M14-Se03672			X	X
TP19 0.3	Aug 22, 2014		Soil	M14-Se03673		X		
TP20 0.3	Aug 22, 2014		Soil	M14-Se03674		X		
TP20 1.0	Aug 22, 2014		Soil	M14-Se03675		X		
TP21 0.3	Aug 22, 2014		Soil	M14-Se03676		X		
TP21 1.0	Aug 22, 2014		Soil	M14-Se03677		X		
TP22 1.0	Aug 22, 2014		Soil	M14-Se03678		X		
TP23 0.3	Aug 22, 2014		Soil	M14-Se03679		X		

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Melbourne
VIC 8009

Client Job No.: TAXIWAY ZULU SB20500.010

Order No.:
Report #: 431001
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Sep 4, 2014 1:46 PM
Due: Sep 11, 2014
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Client Manager: [redacted]

Sample Detail					% Moisture	HOLD	AUS Leaching Procedure	PFOS/PFOA/6:2FTS
Laboratory where analysis is conducted								
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								X
External Laboratory								
TP23 1.0	Aug 22, 2014		Soil	M14-Se03680		X		
TP24 0.3	Aug 22, 2014		Soil	M14-Se03681		X		
TP24 1.0	Aug 22, 2014		Soil	M14-Se03682		X		
TP25 1.0	Aug 22, 2014		Soil	M14-Se03683		X		
TP26 1.0	Aug 22, 2014		Soil	M14-Se03684		X		
TP27 0.3	Aug 22, 2014		Soil	M14-Se03685		X		
TP27 1.0	Aug 22, 2014		Soil	M14-Se03686		X		
TP28 0.3	Aug 22, 2014		Soil	M14-Se03687		X		
TP28 1.0	Aug 22, 2014		Soil	M14-Se03688		X		
TP29 03	Aug 22, 2014		Soil	M14-Se03689		X		
TP29 1.0	Aug 22, 2014		Soil	M14-Se03690		X		

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Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								X
External Laboratory								
TP30 0.3	Aug 22, 2014		Soil	M14-Se03691		X		
TP31 1.0	Aug 22, 2014		Soil	M14-Se03692		X		
TP32 0.3	Aug 22, 2014		Soil	M14-Se03693		X		
TP32 1.0	Aug 22, 2014		Soil	M14-Se03694		X		
TP33 0.3	Aug 22, 2014		Soil	M14-Se03695		X		
TP33 1.0	Aug 22, 2014		Soil	M14-Se03696		X		
TP34 1.0	Aug 22, 2014		Soil	M14-Se03697		X		
TP35 0.3	Aug 22, 2014		Soil	M14-Se03698		X		
TP35 1.0	Aug 22, 2014		Soil	M14-Se03699		X		
TP36 0.3	Aug 22, 2014		Soil	M14-Se03700		X		
TP36 1.6	Aug 22, 2014		Soil	M14-Se03701		X		

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External Laboratory								
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QAQC1	Aug 20, 2014		Soil	M14-Se03703		X		
QAQC2	Aug 20, 2014		Soil	M14-Se03704		X		
RINSATE 1	Aug 20, 2014		Water	M14-Se03705		X		
RINSATE 2	Aug 21, 2014		Water	M14-Se03706		X		
TP30 1.0	Aug 22, 2014		Soil	M14-Se03707		X		

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. 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. 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.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
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 20-130%.

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, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene 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 Arochlor 1260 in Matrix Spikes and LCS's.
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 RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

[redacted]

Quality Control Results

[redacted]

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	No
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	No
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
I11	The recommended holding time from field collection to leachate extraction is 7 days for volatiles and 14 days for semi-volatiles. This holding time is 28 days for mercury and 180 days for all other metals.

Authorised By

[redacted]

Client Services
Senior Analyst-Organic (QLD)

Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

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.

[redacted]

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
PFOS/PFOA/6:2FTS	Brisbane	Sep 09, 2014	14 Day
- Method: LTM-ORG-2100 Determination of PFCs in aqueous and soil samples by LC-MS/MS			
% Moisture	Melbourne	Sep 04, 2014	14 Day
- Method: Method 102 - ANZECC - % Moisture			

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Address: PO Box 312 Flinders Lane
Melbourne
VIC 8009

Client Job No.: TAXIWAY ZULU SB20500.010

Order No.:
Report #: 431001
Phone: 03 8668 3000
Fax: 03 8668 3001

Received: Sep 4, 2014 1:46 PM
Due: Sep 11, 2014
Priority: 5 Day
Contact Name: [redacted]

Eurofins | mgt Client Manager: [redacted]

Sample Detail					% Moisture	HOLD	AUS Leaching Procedure	PFOS/PFOA/6:2FTS
Laboratory where analysis is conducted								
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X	
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								X
External Laboratory								
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
TP37 0.3	Aug 20, 2014		Soil	M14-Se03659	X			X
TP19 0.3	Aug 22, 2014		Soil	M14-Se03660	X			X
TP25 0.3	Aug 21, 2014		Soil	M14-Se03661	X			X
TP26 0.3	Aug 21, 2014		Soil	M14-Se03662	X			X
TP22 0.3	Aug 22, 2014		Soil	M14-Se03663	X			X
TP31 0.3	Aug 22, 2014		Soil	M14-Se03664	X			X
TP34 0.3	Aug 22, 2014		Soil	M14-Se03665	X			X
TP37 0.3	Aug 20, 2014		ASLP - pH 5.0	M14-Se03666			X	X
TP19 0.3	Aug 20, 2014		ASLP - pH 5.0	M14-Se03667			X	X
TP25 0.3	Aug 20, 2014		ASLP - pH 5.0	M14-Se03668			X	X

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Brisbane Laboratory - NATA Site # 20794								X
External Laboratory								
TP26 0.3	Aug 20, 2014		ASLP - pH 5.0	M14-Se03669			X	X
TP22 0.3	Aug 20, 2014		ASLP - pH 5.0	M14-Se03670			X	X
TP31 0.3	Aug 20, 2014		ASLP - pH 5.0	M14-Se03671			X	X
TP34 0.3	Aug 20, 2014		ASLP - pH 5.0	M14-Se03672			X	X
TP19 0.3	Aug 22, 2014		Soil	M14-Se03673		X		
TP20 0.3	Aug 22, 2014		Soil	M14-Se03674		X		
TP20 1.0	Aug 22, 2014		Soil	M14-Se03675		X		
TP21 0.3	Aug 22, 2014		Soil	M14-Se03676		X		
TP21 1.0	Aug 22, 2014		Soil	M14-Se03677		X		
TP22 1.0	Aug 22, 2014		Soil	M14-Se03678		X		
TP23 0.3	Aug 22, 2014		Soil	M14-Se03679		X		

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TP25 1.0	Aug 22, 2014		Soil	M14-Se03683		X		
TP26 1.0	Aug 22, 2014		Soil	M14-Se03684		X		
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TP27 1.0	Aug 22, 2014		Soil	M14-Se03686		X		
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TP29 1.0	Aug 22, 2014		Soil	M14-Se03690		X		

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TP32 1.0	Aug 22, 2014		Soil	M14-Se03694		X		
TP33 0.3	Aug 22, 2014		Soil	M14-Se03695		X		
TP33 1.0	Aug 22, 2014		Soil	M14-Se03696		X		
TP34 1.0	Aug 22, 2014		Soil	M14-Se03697		X		
TP35 0.3	Aug 22, 2014		Soil	M14-Se03698		X		
TP35 1.0	Aug 22, 2014		Soil	M14-Se03699		X		
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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. 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.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
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 20-130%.

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, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene 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 Arochlor 1260 in Matrix Spikes and LCS's.
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 RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

[redacted]

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
PFOS/PFOA/6:2FTS							
Perfluorooctanesulfonic acid (PFOS)	mg/kg	< 0.005			0.005	Pass	
Perfluorooctanoic acid (PFOA)	mg/kg	< 0.005			0.005	Pass	
1H.1H.2H.2H-perfluorooctansulfonic acid (6:2 FTS)	mg/kg	< 0.005			0.005	Pass	
LCS - % Recovery							
PFOS/PFOA/6:2FTS							
Perfluorooctanesulfonic acid (PFOS)	%	103			70-130	Pass	
Perfluorooctanoic acid (PFOA)	%	117			70-130	Pass	
1H.1H.2H.2H-perfluorooctansulfonic acid (6:2 FTS)	%	88			70-130	Pass	

[redacted]

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	No
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	No
Some samples have been subcontracted	No

Authorised By

[redacted]

Client Services
Senior Analyst-Inorganic (VIC)
Senior Analyst-Organic (QLD)

Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

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