Fire and Rescue NSW

Albion Park

Lake Illawarra Biota Sampling

August 2018

Executive summary

Biological sampling of aquatic biota was conducted in the southern half of Lake Illawarra following minor detections of PFAS in sediments and surface water along Albion Creek and in the southern boundary of Koona Bay (GHD, 2017). New South Wales Department of Primary Industries – Fisheries (NSW DPI) and the NSW Environment Protection Authority (EPA) requested Fire and Rescue New South Wales (FRNSW) collect and analyse aquatic organisms of high commercial and recreational value to be analysed for potential presence of per- and poly-fluoroalkyl substances (PFAS).

Surface water, sediment and biota samples were collected from the southern half of Lake Illawarra. Six species (mud ark, yellowfin bream, dusky flathead, luderick, sea mullet and blue swimmer crab) were collected as part of the sampling works and analysed as composite samples.

PFAS were not detected in surface water or sediment from the investigation. Perfluorooctane sulfonate (PFOS) was the only PFAS detected in biota samples (with 52% of samples having detectable concentrations of PFOS), with concentrations ranging from <0.5 µg/kg to 2.1 µg/kg. These concentrations are below the Food Standards Australia New Zealand (FSANZ) trigger points derived for finfish (5.2 µg/kg) and crustaceans (65 µg/kg).

Given that consumption of fish is the only identified pathway to human receptors in the area and that organisms caught commercially will be diluted in the marketplace, it is considered that the potential for risk to human consumers of these species is low and acceptable. Based on the findings of these works, a more detailed site-specific risk assessment for off-site users is not required at this stage.

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1. Introduction

1.1 Background

Fire and Rescue NSW (FRNSW) commissioned GHD Pty Ltd (GHD) to undertake a series of investigations at properties suspected to have been impacted with per- and poly-fluoroalkyl substances (PFAS) as a result of historic fire training activities. The Albion Park training ground is one of these properties and is located to the south of Lake Illawarra, with a small stream, Albion Creek, flowing into Koona Bay in southern Lake Illawarra (Figure 1, Appendix A). Biological sampling of aquatic biota was conducted in the southern half of Lake Illawarra following low level detections of PFAS in sediments and surface water along Albion Creek and in the southern boundary of Koona Bay.

New South Wales Department of Primary Industries – Fisheries (DPI) and the Environment Protection Authority (EPA) requested FRNSW collect and analyse aquatic organisms of high commercial and recreational value to be analysed for potential presence of PFAS.

These results supplement additional works completed in the area as part of the Environmental Site Assessment (ESA). Additional information about the site setting, history, and previous sample results is provided in the ESA report:

- GHD (2017) *Fire and Rescue NSW, Albion Park Training Facility, Phase 2 Environmental Site Assessment* – PFAS, October 2017

2. Sampling and analysis program

2.1 Targeted species

Following extensive liaison with DPI, EPA and FRNSW, it was determined that ten aquatic species would be targeted as part of the sampling effort. The biota sampling proposed for Lake Illawarra encompassed aquatic species comprising approximately 85% of the harvested commercial biomass as well as the primary recreational species of interest (per DPI).

The southern half of the lake was targeted in the present sampling effort due to the size of Lake Illawarra and myriad commercial and industrial operations in the area to limit the potential for confounding inputs of PFAS, if present, particularly in the northern portion of the lake which receives discharge from the commercial and industrial operations around Port Kembla.

It was determined that commercial fishers would be employed to assist with sampling of Shellharbour (southern Lake Illawarra) (per NSW EPA Communications Strategy 2018). GHD was contacted by a local commercial fisherman who expressed interest in assisting the sampling efforts following the release of the NSW EPA Communications Strategy.

GHD conducted biota sampling in the southern portion of Lake Illawarra (Figure 1, Appendix A) on board a commercial fishing vessel. Benthic organism sampling was conducted independently by GHD while on board the vessel. Crabs were targeted using crab-pots under GHD's scientific collection permit.

It is noted that local DPI personnel and the commercial fisherman engaged for this program have indicated that prawns are not present in sufficient abundance to be fished commercially following the opening of Lake Illawarra to the sea. Additionally, it is noted that cockles in Lake Illawarra are not currently collected for human consumption, rather they are collected and sold as bait. However, given that recreational collection can occur, cockles remained under consideration in the present sampling plan.

The ten species targeted for collection are presented in Table 1.

Table 1 Target species

Scientific Name	Common Name	Species code
Mugil cephalus	Sea Mullet	MUGCEP
Portunus armatus	Blue Swimmer Crab	PORARM
Scylla serrata	Mud Crab	SCYSER
Platycephalus fuscus	Dusky Flathead	PLAFUS
Metapenaeus macleayi	School Prawn	METMAC
Girella tricuspidata	Luderick	GIRTRI
Gerres subfasciatus	Common Silverbiddy	GERSUB
Silago maculate	Trumpeter Whiting	SILMAC
Acanthopagrus spp.	Bream (Yellowfin or Black)	ACASPP
Anadara trapezia	Mud Ark	ANATRA

2.2 Sampling program

The sampling works were conducted from 29 – 31 May, including overnight works per the commercial fishing requirements. Photos taken from daytime works (including surface water, sediment, and mud ark collection) are presented in Appendix C.

Eurofins mgt. was selected as the primary laboratory and ALS was selected as the secondary laboratory. Eurofins was commissioned to perform the dissections and compositing of the biota as described in Section 2.2.3, prior to forwarding on the secondary samples to ALS. All samples

were transported from Lake Illawarra to the Eurofins laboratory in Brisbane by refrigerated courier with chain of custody (CoC) documentation.

2.2.1 Surface water

Proposed surface water sampling locations were selected with the aim of identifying areas of potential or likely runoff from PFAS sources present on-site and off-site and to get an appreciation of concentration levels around the locations where the target fish species are commercially harvested.

Surface water samples were collected directly from the lake by hand from the fishing boat and by wading out to appropriate locations from the shore (Figure 1, Appendix A). The capped sampling container was inserted under the surface of the water with the opening pointing down to avoid the collection of surface films (DER 2017). The sample container was opened for sampling at least 10 cm from the sediment bed and below the surface water level (DER 2017).

Sample IDs and locations are summarised in Table 2 and depicted on Figure 1, Appendix A.

Table 2 Surface water and QA/QC samples collected

Sample ID	Description
R1	Knife rinsate
R2	Chopping board rinsate
R3	Net rinsate
TB1	Trip blank boat day 1
TB2	Trip blank boat day 2
TB3	Trip blank field day 3
WQ1	Lake day 1
WQ2	Lake day 1
WQ3	Davies Bay
WQ4	Field blank day 1
WQ5	Field blank day 3
WQ6	Koona Bay East
WQ7	Koona Bay Windang St.
WQ8	Koona Bay Creek Mouth

2.2.2 Sediment

Sediment samples were collected from the same location that the mud arks were collected (Photograph 1, Appendix C) as well as three locations in Koona Bay (Figure 1, Appendix A and Photographs 2-4, Appendix C). Samples were collected at the surface and at depth to a maximum of 0.3 m bgl in duplicate at each location using either a decontaminated stainless steel trowel or by scooping surface sediments directly off the lake substrate with the sediment jar, depending on substrate hardness.

Sample IDs and locations are summarised in Table 3 and depicted on Figure 1, Appendix A.

Table 3 Sediment samples collected

Sample ID	Description
SED 1	Koona bay East (WQ06)
SED 2	Koona Bay Windang Street (WQ07)
SED 3	Koona Bay Albion Creek Mouth (WQ08)
SED 4	Davies Bay (WQ03)

2.2.3 Biota

Sampling was successful for six of the ten nominated targeted species. Mud crab, school prawn, trumpeter whiting, and common silverbiddy were not encountered during the sampling works. All sampling was undertaken in accordance with the PFAS sampling guidelines in the NSW DPI-Fisheries Standard Operating Protocol for PFAS Sample Collection and GHD's Standard Operating Procedures for PFAS sampling (GHD, 2018).

Twenty individuals per species were collected. All organisms were examined for lesions, external parasites and gill health, and length and weight measurements were taken. No abnormalities were observed. Each individual was numbered and placed into separate PFAS – free zip lock bags which were supplied by Eurofins. Five individuals were grouped to comprise each composite (four composites per species), which was then placed in an additional PFAS-free bag. Prior to freezing, individual bags and composite bags were photographed as part of the CoC QA/ QC procedures. All samples were frozen to -20°C.

All samples were labelled with a species code and sample number for further processing at the laboratory. The labelling procedure followed the format below:

212558316_XXXXXX_ZZ_C_DDMMYY
XXXXXX – Species code as per Table 1
ZZ – Individual number
C- Composite number
DDMMYY – Date

Fish

Sea mullet, dusky flathead, luderick, and yellowfin bream were collected over the course of two nights. Fish sampling was undertaken with the assistance of a commercial fishing vessel. Each individual was euthanised using the *iki jime* method. The location of each gill net set by the commercial operator was recorded on GPS and shown on Figure 1, Appendix A.

Fish were highly mobile within the lake. Therefore, the location of capture of individual fish species was not confined to specific areas, and all collected fish species were encountered around the lake from the various nets deployed.

Mud arks

Mud arks were collected by hand in Davies Bay by wading and spotlighting along a transect of 200 m (Figure 1, Appendix A). Individuals were bagged as described in Section 2.2.3 and held on ice before final processing.

Crabs

Two round crab pots were deployed in the survey area (Figure 1, Appendix A). Over two nights of fishing, 20 individual blue swimmer crabs were collected from the two traps. Trap locations were recorded on a held hand GPS unit. The crabs were euthanised by submersion in an ethanol bath. Processing and handling followed the method described in Section 2.2.3.

2.2.4 Ethics and sample handling

All fauna collection and handling was undertaken in strict accordance with the GHD Animal Ethics Committee's (AEC) policies for the targeted species and collection method used. A copy of the animal ethics post-survey report can be found in Appendix D.

3. Quality assurance

3.1 QA/QC procedures

3.1.1 Field QA/QC procedures

All fieldwork was conducted with reference to GHD's Standard Field Operating Procedures, which ensures all samples are collected by a set of uniform and systematic methods, as required by GHD's QA system (GHD, 2018).

Key requirements of these procedures are listed below. Specific requirements for handling PFAS samples to prevent cross-contamination (e.g. no new field clothing, no waterproof clothing or paper and no food wrappers) were followed.

- Pre-Field Decontamination Procedures – All field equipment, including storage equipment (i.e. eskies) were decontaminated prior to use at site. This was done by completing a pre-rinse of all gear, then bathing in a diluted Liqui-Nox solution, followed by a second rinse using PFAS free water. Gear which could not be appropriately decontaminated was not utilised during field work.
- Decontamination procedures - Including the use of new disposable gloves for the collection of each sample, decontamination of the sampling equipment between each biota sample (i.e. decontamination of both the knife and chopping board between fish using a diluted Liqui-Nox solution) and the use of non-Teflon dedicated sampling containers provided by the primary laboratory.
- Euthanasia of biota was undertaken by GHD personnel in the field using stainless steel knife (for fish), ethanol bath (for crustaceans) and freezing (mud arks) as per Animal Ethics requirements. Samples were frozen as soon as practicable before being sent to the laboratory for testing.
- Sample processing of biota was undertaken by the laboratory. Samples were composited and homogenised, prior to being split for secondary analysis at Eurofins at a frequency of 10%.
- CoC information requirements - A CoC form was completed and forwarded to the testing laboratory. Delivery and analysis of samples to the laboratory complied with sample holding times.

3.1.2 Sampling and analysis quality control

The *ASC NEPM* (NEPC 2013) outlines a recommended approach to be adopted for QC sampling. The QC samples collected during the investigation are described as follows:

- Split duplicate: Split duplicate samples provide an indication of the repeatability of the results between laboratories.
- Trip blank: A sample of laboratory supplied deionised water is bottled and accompanies the other samples over the course of the fieldworks and submitted to the laboratory for analyses. Trip blanks provide an indication of contamination introduced during sample transport and handling, and also ensure that the testing laboratory is not reporting "false positives". Trip blanks should not indicate concentrations of the constituents of concern above the laboratory detection limits.
- Rinsate blanks: Rinsate blank samples are used to estimate the amount of contamination introduced during the re-use of sampling equipment. Rinsate blank samples are obtained by pouring laboratory supplied PFAS free water over decontaminated sampling equipment

(e.g. processing knives, the processing chopping board and one of the gill nets on-board the fishing vessel) into laboratory supplied bottles. Rinsate blanks are then kept cool in insulated containers until delivery to the laboratory. All rinsate samples will be collected using PFAS free laboratory supplied water. Additional rinsate samples were taken by the laboratory during the processing of the fish to achieve a rinsate frequency of analysis of 10%.

3.1.3 Laboratory QA/QC procedures

Laboratory methods to be used by the primary and secondary laboratories were suitable for environmental contaminant analysis and are based on established internationally recognised procedures. Each of the laboratories is NATA accredited for the proposed analysis.

The following laboratory QC procedures have been applied to this investigation.

Laboratory duplicate samples

Laboratory duplicate sample analysis is the analysis of a laboratory derived duplicate sample from the process batch, at a rate equivalent to one in 10 samples per analytical batch. A laboratory duplicate provides data on the analytical precision and reproducibility of the analytical results.

Method blank samples

Method or blank sample analyses are the analyses of a sample that is as free as possible of the analyte(s) of interest, but has been prepared the same as the samples under investigation. The analysis is to ascertain if laboratory reagents, glassware and other laboratory consumables contribute to the observed concentration of analytes in the process batch. If below the maximum acceptable method blank (below practical quantification limit), the contribution is subtracted from the gross analytical signal for each analysis before calculating the sample analyte concentration. The method blank should return analyte concentrations as ‘not detected’.

Laboratory control samples

Laboratory control spike analysis is the analysis of either a reference material or a control matrix fortified with analytes representative of the analyte class. The purpose of laboratory control spike samples is to monitor method precision and accuracy independent of the sample matrix. Typically, the percentage recovery of the laboratory control spike sample is compared to the dynamic recovery limits based on the statistical analysis of the processed laboratory control spike sample analysis. Recoveries should lie between 70% and 130%.

Matrix spike samples

Matrix spike sample analysis is the analysis of one or more replicate portions of samples from the batch, after fortifying the additional portion(s) with known quantities of the analyte(s) of interest. The percentage recovery of target analyte(s) from matrix spike samples is used to determine the bias of the method in the specific sample matrix. Recoveries should lie between 70% and 130%.

Surrogate spike samples

Surrogate spike samples are samples with known additions of known amounts of compounds, which are similar to the analytes of interests in terms of extractability, recovery through clean-up procedures and response to chromatographic or other measurement. Surrogate compounds may be alkylated or halogenated analogues or structural isomers of analytes of interest. The purpose of surrogate spikes, which are added immediately before the sample extraction step, is to provide a check for every analysis that no gross processing errors have occurred, which

could have led to significant analyte loss or faulty calculation. Recoveries should lie between 50% and 150%.

Internal standards

Internal standards are known additions of known amounts of compounds which are not found in real samples, will not interfere with quantification of analytes of interest and may be separately and independently quantified. The purpose of internal standards in instrumental techniques is to provide independent signals, which serve to check the consistency of the analytical step. Internal standards are often used for organic compounds and some inorganic compounds.

3.2 QA/QC results

3.2.1 Duplicate Samples

Three biota samples were forwarded to ALS from Eurofins, following compositing and homogenation. All duplicate samples had concentrations of PFAS below the LOR. Notably, two of the three primary samples had detections of PFOS, however these concentrations were below the LOR of the secondary laboratory.

3.2.2 Trip blank

Three trip blank samples were analysed, all results were below the laboratory LOR, indicating that cross-contamination during field works and transport were negligible.

3.2.3 Rinsate sample

Five rinsate samples were collected during the investigation: three during the field works (knife, cutting board, and net), and two during processing in the laboratory. There were no detections of any analytes in any of the rinsate sample. This result confirms that the decontamination processes undertaken were suitable and effective and that cross contamination is unlikely to have had any effect on the results of this investigation.

3.3 Field QA/QC assessment

The evaluation of the QA/QC procedures relevant to the site investigation works has been conducted with reference to Appendix V of the *DEC (2006) Guidelines for the NSW Site Auditor Scheme (2nd edition)*. A summary of the evaluation made is presented in Table 4.

Table 4 Field QA/QC statistical assessment

QA/QC Assessment	Comment
QA/QC program includes replicate samples	Four sediment samples were analysed as part of the investigation with four duplicate samples analysed. This equates to a rate of 100% of the primary samples. Eight surface water samples were analysed as part of the investigation. Six duplicate samples were also analysed. This equates to a rate of 75% of the primary samples analysed during this investigation. This meets the program requirements. 24 biota samples were analysed as part of the investigation. Three duplicate samples were analysed which equates to a rate of 12.5%. This meets the program requirements.
All relevant media assessed	Surface water, sediment and biota were collected as proposed for the site investigation.

QA/QC Assessment	Comment
Appropriateness of sampling strategy	The sampling strategy devised for the investigation was developed and agreed to by FRNSW, NSW EPA, and DPI in conjunction with GHD. The primary goal of the sampling works was to identify potential impact in aquatic biota of commercial and recreational importance. Twenty individuals of each species were collected, and five individuals were composited per sample (four total samples per species). Where possible, water and sediment samples were also collected to inform on the potential impact of PFAS to abiotic media. Due to difficult fishing conditions, water was not able to be collected at each area where biota was collected, however water and sediment samples were targeted near to the inlet of Albion Creek nearest to the site.
Sample collection, handling and transportation procedures	The works for the site investigation were conducted with reference to GHD's standard operating procedures and are therefore considered appropriate for the purpose of this assessment.
Sampling is representative of site conditions	Surface water was collected directly into laboratory supplied bottles form the sources. Sediment was collected directly into soil jars or using a stainless steel trowl with appropriate decontamination as required. Biota were collected as whole specimens and dissected in the laboratory under controlled conditions.
Field QA/QC plan	Samples were placed into ice filled coolers and submitted to a NATA accredited laboratory under CoC documentation. The sample receipt notifications and laboratory transcripts indicated that the samples were received cool. Samples were analysed within the appropriate holding times. Copies of the chain of custody forms, sample receipt notification identifying the samples collected, the requested analytes and the date of collection are included in Appendix F.

3.4 Laboratory QA/QC assessment

Table 5 provides an overview of the laboratory QA/QC quality controls.

Table 5 Laboratory QA/QC assessment

QA/QC Assessment	Comment
Appropriate methodologies used for sample analyses	All laboratory transcripts were NATA stamped and signed by a NATA signatory. The primary laboratory used in this investigation was: Eurofins (Brisbane) Statistical data presented in the laboratory QA/QC reports were considered adequate in demonstrating the precision and accuracy of the methods used to analyse field samples.
Appropriate limit of reporting (LORs)	The laboratory LOR was lower than the majority of the adopted assessment criteria and therefore the LORs were generally considered appropriate. Exceptions to this included: The LOR for PFOS in surface water was higher than the NEMP 2018 Freshwater Ecological Criteria with 99% species protection. However, given that biota were collected as part of the investigation and the Freshwater Ecological Criteria with 99% species protection is generally not considered achievable or appropriate for extrapolation of potential health effects to ecological receptors, this is not a significant limitation as part of the current works.

QA/QC Assessment	Comment
Laboratory QA/QC plan	Copies of signed CoC forms are presented in Appendix F of the report. All samples were received and analysed within the specified laboratory holding times. The analytical methods used are documented on the laboratory reports presented in Appendix F. Laboratory quality control samples included laboratory control samples, internal duplicates, matrix spike and matrix spike duplicates and method blanks. The types of QA/QC samples analysed by the laboratory were considered appropriate to assess the precision and accuracy of the laboratory methods used. The statistical data presented in the laboratory QA/QC reports is generally considered adequate in demonstrating the precision and accuracy of the methods used to analyse field samples. Copies of the laboratory QA/QC reports are provided in Appendix F

4. Assessment framework

4.1 Basis for assessment

The relevant legislation and guidelines that outline the appropriate framework for this investigation include:

- National Environmental Protection Council (NEPC) *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1)* (NEPC, 2013);
- Heads of EPAs Australia and New Zealand (HEPA), *PFAS National Environmental Management Plan (NEMP)* (HEPA, 2018);
- Environmental Health Standards Committee (enHealth) of the Australian Health Protection Principal Committee, *Environmental Health Risk Assessment, Guidelines for Assessing Human Health Risks from Environmental Hazards*;
- NSW EPA, *Designing Sampling Programs for Sites Potentially Contaminated by PFAS – Guidance Document*, November 2016 (EPA, 2016);
- Food Standards Australia New Zealand's (FSANZ) report on *Perfluorinated Chemicals in Food (FSANZ, 2017a);*
- FSANZ, *Health based guidance values for PFAS for use in site investigations in Australia*, April 2017 (FSANZ, 2017b).

4.2 Adopted site investigation levels

The NEPM 1999 (Amendment 2013) includes a range of ecological investigation and screening levels, health investigation levels and health screening levels for a range of contaminants and for a range of land use and exposure scenarios.

The amended NEPM (Schedule B1, Section 2.1.2) states that investigation and screening levels are not clean-up or response levels nor are they desirable media quality criteria. Investigation and screening levels are intended for assessing existing contamination and to trigger consideration of an appropriate site-specific risk-based approach or appropriate risk management options if they are exceeded.

4.2.1 Surface water

With respect to assessing risk posed to aquatic ecological receptors, GHD has adopted the 95% species protection value presented in the NEMP (2018) for surface water samples, which was considered more appropriate than the 99% value. The 99% value has been derived to account for bioaccumulation within aquatic fauna tissue and in this regard, the results of the biota analysis demonstrate a limited relevance of bioavailability. Additionally, the 99% value is below the LOR currently achievable by commercial laboratories.

4.2.2 Sediment

There are currently no reliable screening values available for PFAS in sediments. Soil criteria are not to be used for protection of sediment health. It is noted that, where relevant, sediments in receiving environments must also be considered because water concentrations alone may not be sufficient to identify ecological exposure/risks and sediments can present an ongoing secondary source. Although there are currently no screening criteria for sediments, identifying PFAS in sediments is key to understanding if there is a complete pathway to aquatic biota.

4.2.3 Biota

In 2017, FSANZ derived proposed trigger points for a variety of dietary items. These trigger points are *the maximum concentration level of [PFOS+PFHxS and PFOA] that could be present in individual foods or food groups so even high consumers of these foods would not have dietary exposures exceeding the relevant [tolerable daily intake (TDI)]*. These values have been selected as screening criteria for the investigation for consumption of finfish and crustaceans.

It is noted that the trigger points assume that consumption of the dietary item in question is the only source of exposure to PFAS (i.e., background exposure from all other foods and other pathways is zero). Given that no other exposure pathways have been identified to receptors in this system and any impact in commercially obtained fish will be diluted in the marketplace, these values are considered appropriately conservative for this investigation.

4.2.4 Summary of PFAS criteria

A summary of the published PFAS screening levels to be adopted for this assessment are included in Table 6 and are based on the guidelines discussed above.

Table 6 PFAS screening levels for soil, sediment, surface water, groundwater and food

Exposure scenario	PFOS+PFHxS	PFOA
Human Health		
Tolerable daily intake (µg/kg/d)ab	0.02	0.16
Drinking water quality guideline (µg/L)ab	0.07	0.56
Recreational water quality guideline (µg/L)ab	0.7	5.6
Finfish (all)(µg/kg)b	5.2	41
Crustaceans (µg/kg)b	65	520
Ecological Health		
Freshwater 95% Species Protection (µg/L)a	0.13	220
Notes: a – PFAS National Environmental Management Plan (NEMP) (HEPA 2018) b – Food Standards Australia New Zealand (FSANZ) Proposed Trigger Points (2017a)		

5. Results

5.1 Field observations

5.1.1 Weather conditions

The conditions on Lake Illawarra during the two nights of fishing and the shore based sampling on 30 May are shown in Table 7 and are based on data collected at the Bureau of meteorology Albion Park site (068241).

Table 7 Daily weather observations from Albion Park (068241)[1]

Date	Daily minimum temperature (° C)	Daily maximum temperature(° C)	Wind speed (max gust km/h)	Wind direction	Rainfall (mm)	Barometer (hPa)
28/05/2018	7.1	22.2	26	ENE	0	1021.5
29/05/2018	4.5	24.9	31	WSW	0	1015.3
30/05/2018	12.4	17.3	52	WSW	17.6	1019.1

5.1.2 Tidal information

Tide information (at Port Kembla) is shown in Table 8.

Table 8 Daily tide information at Port Kembla

Tide	Monday 28 May	Tuesday 29 May	Wednesday 30 May
Low	1.30 am	2.13 am	3.33 am
	0.45 m	0.42 m	0.40 m
High	7.20 am	8.03 am	9.28 am
	1.40 m	1.36 m	1.30 m
Low	1.10 pm	1.45 pm	2.19 pm
	0.47 m	0.51 m	0.55 m
High	7.41 pm	8.16 pm	8.52 pm
	1.74 m	1.76 m	1.77 m

5.1.3 Sample abnormalities

There were no obvious abnormalities observed on any of the individual fish, crustaceans or bivalves collected during the field sampling. However, the laboratory found isopod parasites in seven individual luderick *(Girella tricuspidata)* (Appendix E).

[1] http://www.bom.gov.au/climate/dwo/201805/html/IDCJDW2001.201805.shtml

5.2 Analytical results

Analytical results for each media are summarised below. Results tables are presented in Appendix B and analytical laboratory reports are presented in Appendix F.

5.2.1 Surface water

Concentrations of all PFAS were below the laboratory limit of reporting (LOR, 0.01 µg/L) in all surface water samples. The LOR is less than the assessment criteria for PFOS+PFHxS adopted in this assessment for recreational use (0.7 µg/L) and the ecological health criteria for 95% species protection (0.13 µg/L). It is noted that the LOR is also less than the recreational water quality criteria of 0.7 µg/L and the drinking water criteria value of 0.07 µg/L, however due to the salinity in Lake Illawarra, potable use of this water body is not anticipated.

Surface water results are presented in Table B-1 (Appendix B).

5.2.2 Sediment

Concentrations of all PFAS were below the laboratory limit of reporting (5 µg/kg) in all sediment samples.

Sediment results are presented in Table B-2 (Appendix B).

5.2.3 Biota

PFOS was the only PFAS detected in biota in this investigation and detection frequency was variable across species. PFOS was not detected in mud arks or yellowfin bream within the investigation area, but was detected in three of the four composites for blue swimmer crab and luderick, and in all four composites of flathead and sea mullet. Concentrations in all biota ranged from below the LOR (< 0.5 µg/kg) to a maximum PFOS concentration of 2.1 µg/kg in a luderick composite. A summary of the results in biota is presented in Table 9 and presented in Table B-3 (Appendix B).

The average PFOS concentration for all species was less than 1 µg/kg. The concentrations reported presently, including the maximum concentration in luderick, are all less than the FSANZ finfish trigger point of 5.2 µg/kg (and also less than the trigger point of 65 µg/kg crustaceans).

Based upon these findings, risk to human health associated with consumption of these species is deemed to be low and acceptable and further detailed human health and ecological risk assessment is not deemed necessary at this stage.

Table 9 PFAS concentrations for the Lake Illawarra biota

Species code	Species	Common name	Number of PFOS Detections (of 4)	PFOS concentration range (mean) (µg/kg) (n=4)	Notes
MUGCEP	Mugil cephalus	Sea mullet	4	0.8-1 (0.9)	-
PORARM	Portunus armatus	Blue swimmer crab	3	<0.5 – 0.9 (0.6)	-
PLAFUS	Platycephalus fuscus	Dusky flathead	4	0.5-1 (0.8)	-
GIRTRI	Girella tricuspidata	Luderick	3	<0.5 – 2.1 (0.9)	Isopod parasites recorded in 7 individuals
ACAAUS	Acanthopagrus spp.	Yellowfin bream	0	<0.5	-
ANATRA	Anadara trapezia	Mud ark	0	<0.5	-

6. Discussion of findings

6.1 Surface water

PFAS were not detected in any of the surface water samples collected from around the lake, including those near the outfall of Albion Creek into Koona Bay.

Previous surface water sampling locations SW04 and SW09, located near the mouth of Albion Creek and towards the northern shore of Koona Bay respectively, reported PFAS concentrations below the LOR (GHD, 2017). Previous surface water sample SW08, located towards the south-western shore of Koona Bay, reported low levels of PFAS with concentration of PFHxS +PFOS of 0.06 µg/L reported in May 2017 sampling event.

Based on the findings reported by GHD (2017), PFAS concentrations were reported to decrease with distance from the FRNSW training site. Notably, the groundwater wells directly down gradient of the site (GW06, GW07 and GW08) had concentrations of PFAS below the LOR, indicating that advection from the site is not contributing to PFAS impact in the lake (GHD, 2017). This has been confirmed within the present sampling event, where PFAS was not detected in surface water or sediment samples.

The results of the current surface water sampling completed as part of this scope of biota sampling works supports GHD's previous conclusion that mass flux of PFAS via the drainage channels into Lake Illawarra is likely to be low.

6.2 Sediment

PFAS were not detected in any of the sediment samples collected from around the lake, including those near the outfall of Albion Creek into Koona Bay.

Based on the findings of the ESA (GHD, 2017), the distribution of PFAS in sediments showed PFAS was likely to be migrating from the training site via the surface water drainage lines. Low levels of PFAS were reported in sediment samples collected from the mouth of Albion Creek (SS04), northern shore of Koona Bay (SS09) and south western shore of Koona Bay (SS08) with concentrations ranging from 0.7 µg/kg to 20 µg/kg.

Given that sediments in particular have been suggested as on-going secondary sources in this and similar PFAS site investigations, the results of the recent sediment sampling conducted as part of this program of additional biota sampling suggest that lake flushing is occurring within the system following the opening of the lake to the sea.

6.3 Biota

GHD collected 20 individuals of each of six species, which were composited with 5 individuals per composite. PFOS was the only PFAS compound detected in biota, at a frequency of 52% of samples (including duplicate samples). PFOS concentrations were below the FSANZ trigger points for finfish and crustaceans for all samples. These results indicate that a more detailed site-specific risk assessment for off-site users is not required at this stage.

While some of the species identified in the original sampling scope were not achievable during the sampling works, the sampling plan remains sufficiently robust to indicate that risk to recreational and commercial fishers in this system is low and acceptable. Collected organisms are considered representative of benthic (mud ark, blue swimmer crab and flathead) and pelagic conditions (mullet, bream and luderick) and include both crustaceans and finfish.

Because surface water and sediment samples had concentrations below the LOR at all locations, a comparison of biota PFOS concentrations with abiotic media results could not be achieved as part of this current phase of works. However, given the mobility of aquatic biota, it is unclear if any relationship would have been present

7. Summary and conclusions

Biological sampling of aquatic biota was conducted in the southern half of Lake Illawarra following minor detections of PFAS in sediments and surface water along Albion Creek and in the southern boundary of Koona Bay (GHD, 2017). NSW DPI and the EPA requested FRNSW collect and analyse aquatic organisms of high commercial and recreational value to be analysed for potential presence of PFAS.

Surface water, sediment and biota samples were collected from the southern half of Lake Illawarra. Six species (mud ark, yellowfin bream, dusky flathead, luderick, sea mullet and blue swimmer crab) were collected as part of the sampling works and analysed as composites samples.

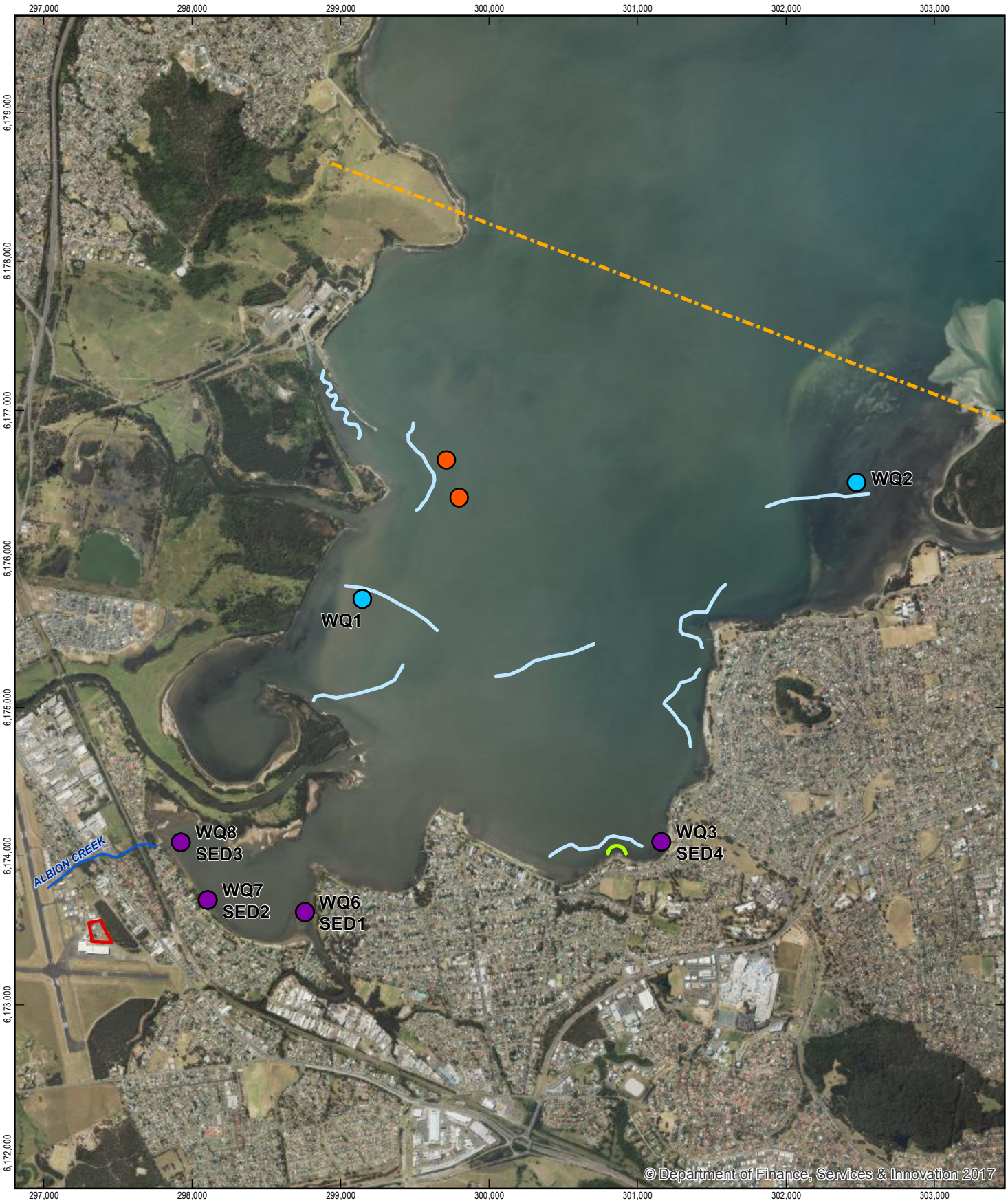
PFAS were not detected in surface water or sediment from the investigation. PFOS was the only PFAS detected in biota samples (with 52% of samples having detectable concentrations of PFOS), with concentrations ranging from <0.5 µg/kg to 2.1 µg/kg. These concentrations are below the PFOS+PFHxS FSANZ trigger points derived for finfish (5.2 µg/kg) and crustaceans (65 µg/kg).

Given that consumption of fish is the only identified pathway to human receptors in the area and that organisms caught commercially will be diluted in the marketplace, it is considered that the potential for risk to human consumers of these species is low and acceptable. Based on the findings of these works, a more detailed site-specific risk assessment for off-site users is not required at this stage.

Appendices

Appendix A – Figures

Figure 1 Sample locations



LEGEND

Sample Type

- Water
- Water & Sediment
- Crab Pot

- Net Path
- Mud Ark Collection Transect
- Biota Sampling (South of Line)
- Site Boundary
- Albion Creek

Fish were collected from across the investigation area and not confined to individual nets.

0 125 250 500 750 1,000

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

Fire & Rescue NSW
Albion Park Site Investigation

Job Number 21-25583
Revision B
Date 18 Jul 2018

Biota Sample Locations

Figure 1

133 Castlereagh Street Sydney NSW 2000 Australia T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com W www.ghd.com

N:\AU\Sydney\Projects\21\25583\GIS\Maps\Working\AlbionPark_BiotaSampleLocations.mxd

Data source: GHD, Aerial: DFSI 2017, Albion Park Biota. Created by:jpcox

Appendix B - Tables

Table 1 – Surface Water
Table 2 – Sediment
Table 3 - Biota

				Perfluorodecanesulfonic acid (PFDS)	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	N-Methyl perfluorooctane sulfonamidoethanol	Sum of US EPA PFAS (PFOS + PFOA)*	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	Perfluoroheptane sulfonic acid (PFHpS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	Perfluorobutane sulfonic acid (PFBS)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoropentanoic acid (PFPeA)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				0.01	0.01	0.05	0.01	0.05	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.05
NEMP 2018 Recreational Surface Water Criteria																	
NEMP 2018 Drinking Water Criteria																	
Location Code	**Date**	**Field ID**	**Sample Type**	**Matrix Type**													
Davies Bay	29/05/2018	WQ3DUP - MUD ARK LOCATION	Normal	water	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.05
Davies Bay	29/05/2018	WQ3 - MUD ARK LOCATION	Normal	water	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.05
Koona Bay Crk Mouth	31/05/2018	WQ8DUP - KOONA BAY	Field_D	water	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.05
Koona Bay Crk Mouth	31/05/2018	WQ8 - KOONA BAY	Normal	water	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.05
Koona Bay East	31/05/2018	WQ6DUP - KOONA BAY	Field_D	water	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.05
Koona Bay East	31/05/2018	WQ6 - KOONA BAY	Normal	water	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.05
Koona Bay Windang St	31/05/2018	WQ7DUP - KOONA BAY	Field_D	water	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.05
Koona Bay Windang St	31/05/2018	WQ7 - KOONA BAY	Normal	water	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.05
Lake Illawarra South	29/05/2018	WQ1DUP - LAKE DAY 1	Field_D	water	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.05
Lake Illawarra South	29/05/2018	WQ1 - LAKE DAY 1	Normal	water	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.05
Lake Illawarra South	29/05/2018	WQ2DUP - LAKE DAY 1	Field_D	water	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.05
Lake Illawarra South	29/05/2018	WQ2 - LAKE DAY 1	Normal	water	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.05
Statistics																	
95% UCL (Student's-t) *					0.005	0.005	0.025	0.005	0.025	0.005	0.005	0.005	0.005	0.025	0.005	0.005	0.005	0.025

* A Non Detect Multiplier of 0.5 has been applied.

				PFAS																		
				N-Ethyl perfluorooctane sulfonamidoethanol	N-Methyl perfluorooctane sulfonamide (MeFOSA)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	Perfluorooctanoic acid (PFOA)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorobutanoic acid (PFBA)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonic acid (PFOS)	Perfluorooctane sulfonamide (FOSA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	PFAS (Sum of Total)	PFAS (Sum of Total)(WA DER List)	Sum of PFHxS and PFOS
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				0.05	0.05	0.05	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.1	0.05	0.01
NEMP 2018 Recreational Surface Water Criteria							5.6															0.7
NEMP 2018 Drinking Water Criteria							0.56															0.07
Location Code	**Date**	**Field ID**	**Sample Type**	**Matrix Type**																		
Davies Bay	29/05/2018	WQ3DUP - MUD ARK LOCATION	Normal	water	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.1	<0.05	<0.01
Davies Bay	29/05/2018	WQ3 - MUD ARK LOCATION	Normal	water	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.1	<0.05	<0.01
Koona Bay Crk Mouth	31/05/2018	WQ8DUP - KOONA BAY	Field_D	water	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.1	<0.05	<0.01
Koona Bay Crk Mouth	31/05/2018	WQ8 - KOONA BAY	Normal	water	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.1	<0.05	<0.01
Koona Bay East	31/05/2018	WQ6DUP - KOONA BAY	Field_D	water	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.1	<0.05	<0.01
Koona Bay East	31/05/2018	WQ6 - KOONA BAY	Normal	water	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.1	<0.05	<0.01
Koona Bay Windang St	31/05/2018	WQ7DUP - KOONA BAY	Field_D	water	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.1	<0.05	<0.01
Koona Bay Windang St	31/05/2018	WQ7 - KOONA BAY	Normal	water	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.1	<0.05	<0.01
Lake Illawarra South	29/05/2018	WQ1DUP - LAKE DAY 1	Field_D	water	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.1	<0.05	<0.01
Lake Illawarra South	29/05/2018	WQ1 - LAKE DAY 1	Normal	water	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.1	<0.05	<0.01
Lake Illawarra South	29/05/2018	WQ2DUP - LAKE DAY 1	Field_D	water	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.1	<0.05	<0.01
Lake Illawarra South	29/05/2018	WQ2 - LAKE DAY 1	Normal	water	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.1	<0.05	<0.01
Statistics																						
95% UCL (Student's-t) *					0.025	0.025	0.025	0.005	0.005	0.025	0.005	0.005	0.005	0.005	0.005	0.005	0.025	0.005	0.005	0.005	0.05	0.025	0.005

* A Non Detect Multiplier of 0.5 has been applied.

	Inorganics															
	Moisture Content (dried @ 103°C)	Perfluorodecanesulfonic acid (PFDS)	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	N-Methyl perfluorooctane sulfonamidoethanol	Sum of US EPA PFAS (PFOS + PFOA)*	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	Perfluoroheptane sulfonic acid (PFHpS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	Perfluorobutane sulfonic acid (PFBS)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoropentanoic acid (PFPeA)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)
	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	1	0.005	0.005	0.005	0.005	0.01	0.005	0.005	0.005	0.005	0.01	0.005	0.005	0.005	0.005
Location Code **Date** **Field ID** **Sample Type** **Matrix Type**															
Davies Bay 31/05/2018 SED4 Normal Sediment	24	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005
Davies Bay 31/05/2018 SED4DUP Field_D Sediment	24	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005
Koona Bay Crk Mouth 31/05/2018 SED3 Normal Sediment	40	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005
Koona Bay Crk Mouth 31/05/2018 SED3DUP Field_D Sediment	39	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005
Koona Bay East 31/05/2018 SED1 Normal Sediment	34	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005
Koona Bay East 31/05/2018 SED1DUP Field_D Sediment	36	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005
Koona Bay Windang St 31/05/2018 SED2 Normal Sediment	31	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005
Koona Bay Windang St 31/05/2018 SED2DUP Field_D Sediment	28	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005
Statistics															
95% UCL (Student's-t) *	36.22	0.0025	0.0025	0.0025	0.0025	0.005	0.0025	0.0025	0.0025	0.0025	0.005	0.0025	0.0025	0.0025	0.0025

* A Non Detect Multiplier of 0.5 has been applied.

	PFAS																			
	N-Ethyl perfluorooctane sulfonamidoethanol	N-Methyl perfluorooctane sulfonamide (MeFOSA)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	Perfluorooctanoic acid (PFOA)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorobutanoic acid (PFBA)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonic acid (PFOS)	Perfluorooctane sulfonamide (FOSA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	PFAS (Sum of Total)	PFAS (Sum of Total)(WA DER List)	Sum of PFHxS and PFOS
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.005	0.005	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.05	0.01	0.005
Location Code	**Date**	**Field ID**	**Sample Type**	**Matrix Type**																
Davies Bay	31/05/2018	SED4	Normal	Sediment	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.01	<0.005
Davies Bay	31/05/2018	SED4DUP	Field_D	Sediment	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.01	<0.005
Koona Bay Crk Mouth	31/05/2018	SED3	Normal	Sediment	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.01	<0.005
Koona Bay Crk Mouth	31/05/2018	SED3DUP	Field_D	Sediment	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.01	<0.005
Koona Bay East	31/05/2018	SED1	Normal	Sediment	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.01	<0.005
Koona Bay East	31/05/2018	SED1DUP	Field_D	Sediment	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.01	<0.005
Koona Bay Windang St	31/05/2018	SED2	Normal	Sediment	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.01	<0.005
Koona Bay Windang St	31/05/2018	SED2DUP	Field_D	Sediment	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.01	<0.005
Statistics																				
95% UCL (Student's-t) *	0.0025	0.0025	0.005	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.025	0.005	0.0025

* A Non Detect Multiplier of 0.5 has been applied.

							NA														
							Sample Description	Weight of Sample Prepared	Perfluorodecanesulfonic acid (PFDS)	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	N-Methyl perfluorooctane sulfonamidoethanol	Sum of US EPA PFAS (PFOS + PFOA)*	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	Perfluoroheptane sulfonic acid (PFHpS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	Perfluorobutane sulfonic acid (PFBS)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	Perfluorooctane sulfonic acid (PFOS) - Branched	Perfluorohexane sulfonic acid (PFHxS)	Perfluorooctane sulfonic acid (PFOS) - Linear
							-	g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL								0.1	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.001	0.0003	0.001
FSANZ 2017 Crustacean Trigger Point																					
FSANZ 2017 Finfish (all) Trigger Point																					
Location Code	**Date**	**Field ID**	**Sample Type**	**Matrix Type**																	
Crab Pots	29/05/2018	212558316_PORARM_(1-5)_1_290518	Normal	Biota					<0.0005	0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Crab Pots	29/05/2018	212558316_PORARM_(6-10)_2_290518	Normal	Biota					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Crab Pots	29/05/2018	212558316_PORARM_(11-15)_3_290518	Normal	Biota					<0.0005	0.0006	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Crab Pots	29/05/2018	212558316_PORARM_(16-20)_4_290518	Normal	Biota					<0.0005	0.0009	<0.0005	0.0009	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Lake Illawarra South	29/05/2018	212558316_ACAAUS_(1-5)_1_290518	Normal	Biota					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Lake Illawarra South	29/05/2018	212558316_ACAAUS_(6-10)_2_290518	Normal	Biota					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Lake Illawarra South	29/05/2018	212558316_ACAAUS_(11-15)_3_290518	Normal	Biota					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Lake Illawarra South	29/05/2018	212558316_ACAAUS_(16-20)_4_290518	Normal	Biota					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Lake Illawarra South	29/05/2018	212558316_ANATRA_(1-5)_1_290518	Normal	Biota					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Lake Illawarra South	29/05/2018	212558316_ANATRA_(6-10)_2_290518	Normal	Biota					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Lake Illawarra South	29/05/2018	212558316_ANATRA_(11-15)_3_290518	Normal	Biota					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Lake Illawarra South	29/05/2018	212558316_ANATRA_(16-20)_4_290518	Normal	Biota					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Lake Illawarra South	29/05/2018	212558316_GIRTRI_(6-10)_2_290518	Interlab_D	Biota		1	109		<0.002		<0.002		<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Lake Illawarra South	29/05/2018	212558316_GIRTRI_(16-20)_4_290518	Interlab_D	Biota		1	112		<0.002		<0.002		<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Lake Illawarra South	29/05/2018	212558316_GIRTTRI_(1-5)_1_290518	Normal	Biota					<0.0005	0.0021	<0.0005	0.0021	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Lake Illawarra South	29/05/2018	212558316_GIRTTRI_(6-10)_2_290518	Normal	Biota					<0.0005	0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Lake Illawarra South	29/05/2018	212558316_GIRTTRI_(11-15)_3_290518	Normal	Biota					<0.0005	0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Lake Illawarra South	29/05/2018	212558316_GIRTTRI_(16-20)_4_290518	Normal	Biota					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Lake Illawarra South	29/05/2018	212558316_MUGCEP_(1-5)_1_290518	Normal	Biota					<0.0005	0.001	<0.0005	0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Lake Illawarra South	29/05/2018	212558316_MUGCEP_(6-10)_2_290518	Normal	Biota					<0.0005	0.0009	<0.0005	0.0009	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Lake Illawarra South	29/05/2018	212558316_MUGCEP_(11-15)_3_290518	Interlab_D	Biota		1	126		<0.002		<0.002		<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Lake Illawarra South	29/05/2018	212558316_MUGCEP_(11-15)_3_290518	Normal	Biota					<0.0005	0.0008	<0.0005	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Lake Illawarra South	29/05/2018	212558316_MUGCEP_(16-20)_4_290518	Normal	Biota					<0.0005	0.0009	<0.0005	0.0009	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Lake Illawarra South	29/05/2018	212558316_PLAFUS_(1-5)_1_290518	Normal	Biota					<0.0005	0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Lake Illawarra South	29/05/2018	212558316_PLAFUS_(6-10)_2_290518	Normal	Biota					<0.0005	0.0007	<0.0005	0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Lake Illawarra South	29/05/2018	212558316_PLAFUS_(11-15)_3_290518	Normal	Biota					<0.0005	0.0008	<0.0005	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Lake Illawarra South	29/05/2018	212558316_PLAFUS_(16-20)_4_290518	Normal	Biota					<0.0005	0.001	<0.0005	0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0003	
Statistics																					
95% UCL (Student's-t) *						1	131		0.00041218	0.00074105	0.00041218	0.00074105	0.00030406	0.00030406	0.00041218	0.00041218	0.00030406	0.00030406	0.0005	0.00022568	0.0005

* A Non Detect Multiplier of 0.5 has been applied.

					PFAS													
					Perfluoropentanoic acid (PFPeA)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoethanol	N-Methyl perfluorooctane sulfonamide (MeFOSA)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	Perfluorooctanoic acid (PFOA)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorobutanoic acid (PFBA)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid (PFNA)
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL					0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
FSANZ 2017 Crustacean Trigger Point											0.52							
FSANZ 2017 Finfish (all) Trigger Point											0.041							
Location Code	**Date**	**Field ID**	**Sample Type**	**Matrix Type**														
Crab Pots	29/05/2018	212558316_PORARM_(1-5)_1_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Crab Pots	29/05/2018	212558316_PORARM_(6-10)_2_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Crab Pots	29/05/2018	212558316_PORARM_(11-15)_3_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Crab Pots	29/05/2018	212558316_PORARM_(16-20)_4_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_ACAAUS_(1-5)_1_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_ACAAUS_(6-10)_2_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_ACAAUS_(11-15)_3_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_ACAAUS_(16-20)_4_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_ANATRA_(1-5)_1_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_ANATRA_(6-10)_2_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_ANATRA_(11-15)_3_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_ANATRA_(16-20)_4_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_GIRTRI_(6-10)_2_290518	Interlab_D	Biota	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.001	<0.001	<0.001
Lake Illawarra South	29/05/2018	212558316_GIRTRI_(16-20)_4_290518	Interlab_D	Biota	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.001	<0.001	<0.001
Lake Illawarra South	29/05/2018	212558316_GIRTTRI_(1-5)_1_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_GIRTTRI_(6-10)_2_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_GIRTTRI_(11-15)_3_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_GIRTTRI_(16-20)_4_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_MUGCEP_(1-5)_1_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_MUGCEP_(6-10)_2_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_MUGCEP_(11-15)_3_290518	Interlab_D	Biota	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.001	<0.001	<0.005	<0.001	<0.002	<0.001	<0.001	<0.001
Lake Illawarra South	29/05/2018	212558316_MUGCEP_(11-15)_3_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_MUGCEP_(16-20)_4_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_PLAFUS_(1-5)_1_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_PLAFUS_(6-10)_2_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_PLAFUS_(11-15)_3_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_PLAFUS_(16-20)_4_290518	Normal	Biota	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Statistics																		
95% UCL (Student's-t) *					0.00041218	0.00041218	0.00041218	0.00041218	0.00073653	0.00041218	0.00030406	0.00030406	0.00073653	0.00030406	0.00041218	0.00030406	0.00030406	0.00030406

* A Non Detect Multiplier of 0.5 has been applied.

	Perfluorooctane sulfonic acid (PFOS)	Perfluorooctane sulfonamide (FOSA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	PFAS (Sum of Total)	PFAS (Sum of Total)(WA DER List)	Sum of PFHxS and PFOS
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.0003	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
FSANZ 2017 Crustacean Trigger Point								0.065
FSANZ 2017 Finfish (all) Trigger Point								0.0052

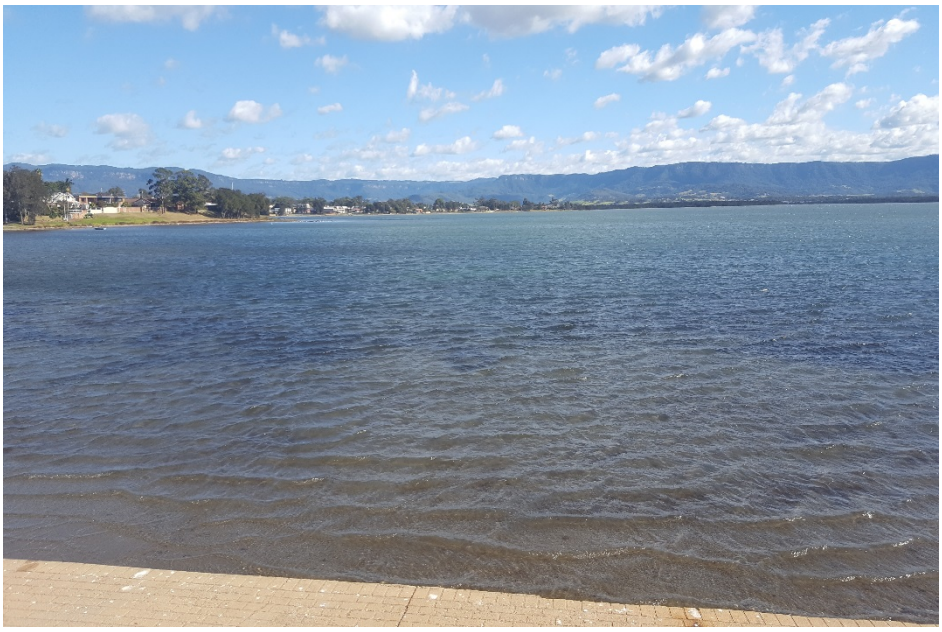
Location Code	Date	Field ID	Sample Type	Matrix Type							
Crab Pots	29/05/2018	212558316_PORARM_(1-5)_1_290518	Normal	Biota	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	0.0005	0.0005
Crab Pots	29/05/2018	212558316_PORARM_(6-10)_2_290518	Normal	Biota	0.0004	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Crab Pots	29/05/2018	212558316_PORARM_(11-15)_3_290518	Normal	Biota	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	0.0006	0.0006
Crab Pots	29/05/2018	212558316_PORARM_(16-20)_4_290518	Normal	Biota	0.0009	<0.0005	<0.0005	<0.0005	<0.0005	0.0009	0.0009	0.0009
Lake Illawarra South	29/05/2018	212558316_ACAAUS_(1-5)_1_290518	Normal	Biota	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_ACAAUS_(6-10)_2_290518	Normal	Biota	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_ACAAUS_(11-15)_3_290518	Normal	Biota	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_ACAAUS_(16-20)_4_290518	Normal	Biota	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_ANATRA_(1-5)_1_290518	Normal	Biota	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_ANATRA_(6-10)_2_290518	Normal	Biota	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_ANATRA_(11-15)_3_290518	Normal	Biota	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_ANATRA_(16-20)_4_290518	Normal	Biota	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_GIRTRI_(6-10)_2_290518	Interlab_D	Biota	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001		
Lake Illawarra South	29/05/2018	212558316_GIRTRI_(16-20)_4_290518	Interlab_D	Biota	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001		
Lake Illawarra South	29/05/2018	212558316_GIRTTRI_(1-5)_1_290518	Normal	Biota	0.0021	<0.0005	<0.0005	<0.0005	<0.0005	0.0021	0.0021	0.0021
Lake Illawarra South	29/05/2018	212558316_GIRTTRI_(6-10)_2_290518	Normal	Biota	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	0.0005	0.0005
Lake Illawarra South	29/05/2018	212558316_GIRTTRI_(11-15)_3_290518	Normal	Biota	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	0.0005	0.0005
Lake Illawarra South	29/05/2018	212558316_GIRTTRI_(16-20)_4_290518	Normal	Biota	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Lake Illawarra South	29/05/2018	212558316_MUGCEP_(1-5)_1_290518	Normal	Biota	0.0010	<0.0005	<0.0005	<0.0005	<0.0005	0.001	0.001	0.001
Lake Illawarra South	29/05/2018	212558316_MUGCEP_(6-10)_2_290518	Normal	Biota	0.0009	<0.0005	<0.0005	<0.0005	<0.0005	0.0009	0.0009	0.0009
Lake Illawarra South	29/05/2018	212558316_MUGCEP_(11-15)_3_290518	Interlab_D	Biota	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001		
Lake Illawarra South	29/05/2018	212558316_MUGCEP_(11-15)_3_290518	Normal	Biota	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	0.0008	0.0008	0.0008
Lake Illawarra South	29/05/2018	212558316_MUGCEP_(16-20)_4_290518	Normal	Biota	0.0009	<0.0005	<0.0005	<0.0005	<0.0005	0.0009	0.0009	0.0009
Lake Illawarra South	29/05/2018	212558316_PLAFUS_(1-5)_1_290518	Normal	Biota	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	0.0005	0.0005
Lake Illawarra South	29/05/2018	212558316_PLAFUS_(6-10)_2_290518	Normal	Biota	0.0007	<0.0005	<0.0005	<0.0005	<0.0005	0.0007	0.0007	0.0007
Lake Illawarra South	29/05/2018	212558316_PLAFUS_(11-15)_3_290518	Normal	Biota	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	0.0008	0.0008	0.0008
Lake Illawarra South	29/05/2018	212558316_PLAFUS_(16-20)_4_290518	Normal	Biota	0.0010	<0.0005	<0.0005	<0.0005	<0.0005	0.001	0.001	0.001

Statistics

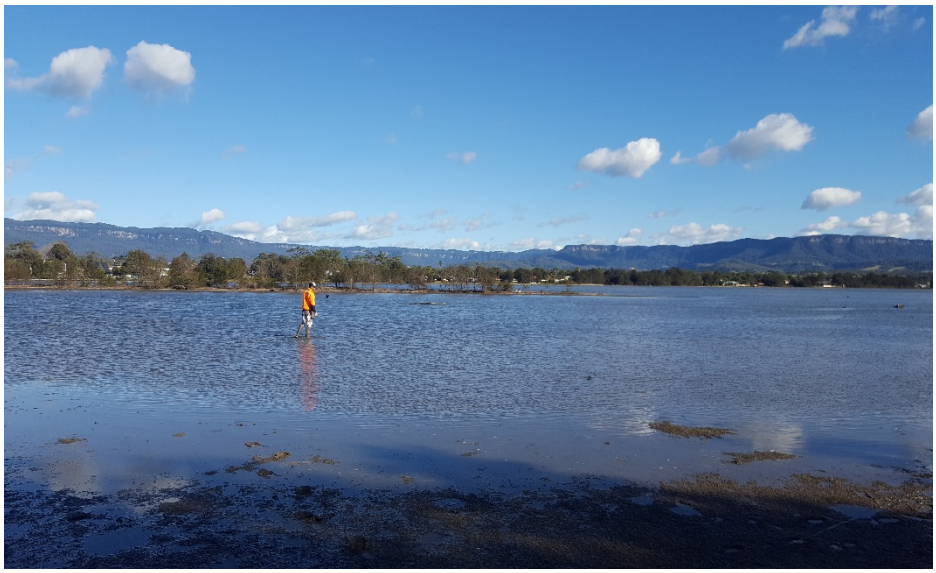
95% UCL (Student's-t) *	0.00069481	0.00073653	0.00041218	0.00041218	0.00030406	0.00071366	0.00074105	0.00074105

* A Non Detect Multiplier of 0.5 has been applied.

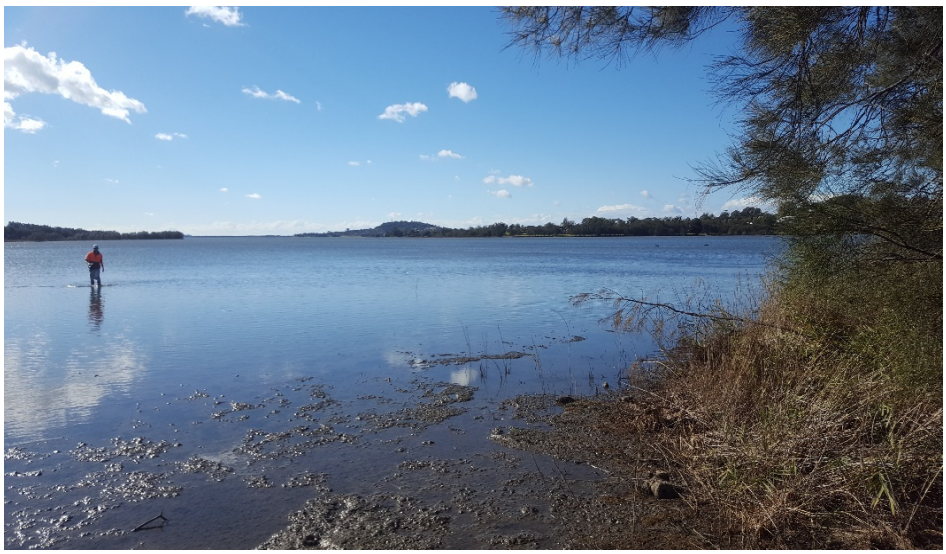
Appendix C – Site photographs



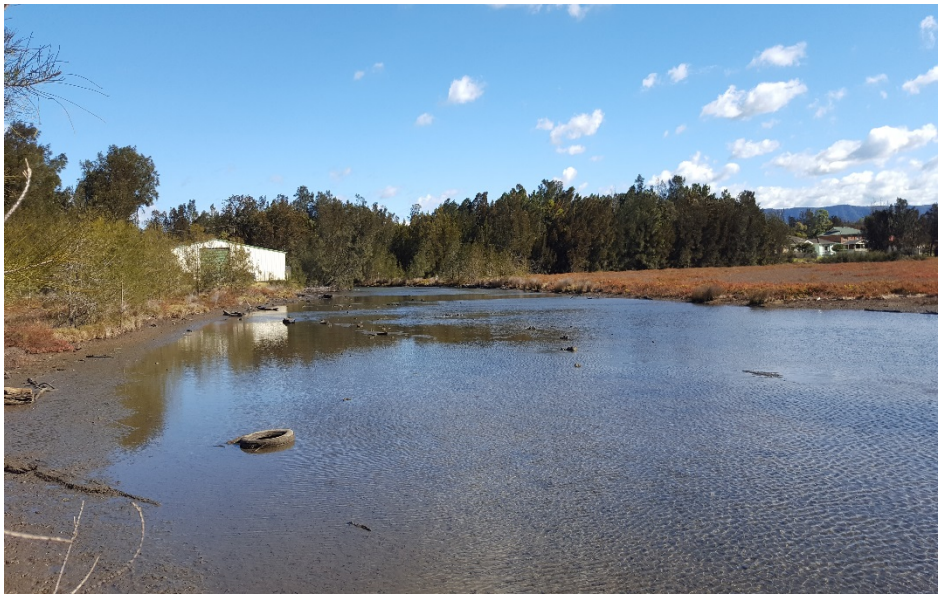
Photograph 1 Davies Bay - location of the shore based sediment (Sed4) and water sampling (WQ3)



Photograph 2 Koona Bay East - location of the shore based sediment (Sed1) and water sampling (WQ6)



Photograph 3 Davies Bay –Windang Street - location of the shore based sediment (Sed2) and water sampling (WQ7)



Photograph 4 Davies Bay locations of the shore based sediment (Sed3) and water sampling (WQ8)

Appendix D – Animal Ethics Committee Post Survey Report

Post Survey Report for Fauna Surveys – All categories

1.1 Project Information

Adverse Incident (Yes or No)	No
Project Name	F&R NSW – Site Investigations
Project Number	212558316
Date(s) of Survey	29-31 May 2018
Purpose of Survey	Biota Sampling
Principal Researcher's Name	Phil Taylor
Associated Field Staff	Josh Cox
Risk Rating	Medium

1.2 Location of Survey

- Lake Illawarra NSW, sampling was confined to the southern half of the Lake.

1.3 Survey Method and Outcomes

Standard Operating Procedures Employed (list them referring to the specific SOP section and name)

4.6 Euthanasia

4.6.3 Physical methods for the euthanasia of fish

Number of Traps and/or Electrofishing Effort (make sure you advise as trapping effort over the number of nights or seconds for electrofishing effort. Add text and fill in table)

Fish were collected from a commercial fishers catch. GHD were present at the collection of the fish, however took no part in the setting or retrival of the nets. The fisher used gill nets which were laid for a period of between 1-3 hours at a time between sunset and sunrise.The required species and number of fish were selected from the fishers catch as they were retrieved from the nets.

GHD staff undertook the collection of cockles by hand. Blue swimmer crabs were collected in two crab pots under GHD's DPI research permit.

1.4 Results

Species and number of individuals observed or trapped

Please provide scientific and common names
Include estimated average duration of species in traps
For indirect observations of fauna please provide an estimate of numbers (eg 10+, 50+ etc. you must provide numbers)
Please provide a key at the bottom of table for Observation Type Codes

Common Name	Species Name	Collection Method	Duration in Net	Number Collected
Dusky Flathead	*Platycephalus fuscus*	Commercial Fisher – Gill Net	1-3 hours	20
Sea Mullet	*Mugil cephalus*	Commercial Fisher – Gill Net	1-3 hours	22
Yellowtail Bream	*Acanthopgrus australis*	Commercial Fisher – Gill Net	1-3 hours	20
Ludderick	*Girella tricuspidata*	Commercial Fisher – Gill Net	1-3 hours	20
Cockle	*Anadara trapezia*	Hand	NA	20
Blue Swimmer Crab	*Portunus armatus*	Crab pot	<6 hours	20

1.5 vioural observations of level of stress of trapped fauna

(Describe any symptoms of stress observed and identify/discuss potential causes and what you did to alleviate them. It is reasonable to assume that any individual trapped will be under some stress.)

Fish were received from the commercial fisher alive and euthanised immediately following the “Physical methods for the euthanasia of fish” as described in the Standard Operating Procedures for Fauna Surveys.

1.6 Recommendations to improve Standard Operating Procedures (if applicable) In accordance with the Code identify opportunities to Replace Reduce, Refine (3Rs) methods to improve animal welfare

N/A

1.7 Animal Use Statistics for New South Wales, Queensland and Victoria

As part of our responsibility under our animal ethics licences we are required to report annually to each state animal ethics licensing authority on the animals we have used (animals observed or trapped). Prior to the Principal Researcher signing off the post survey report statistics for animal use must be entered on the spreadsheet accessible at the links below.

Animal use return links

New South Wales

https://knowledge.ghd.com/technicalservices/Natural/Documents/Animal%20Use%20Return%20statistics%20Fauna%20Projects%20%20NSW%202018.xlsx

Queensland –

https://knowledge.ghd.com/technicalservices/Natural/Documents/Qld%20Animal%20Use%20Return%202017.xlsx?web=1

Victoria –

https://knowledge.ghd.com/technicalservices/Natural/Documents/Victoria%20GHD%20SPFL305%20Animal%20Use%20Return%202017%20-%20Part%20A_observations%20and%20use%20of%20animalsv1.xlsx?web=1

1.8 Principal Researcher's Acknowledgement of Review and Approval

Principal Researcher's Name and Office:	**Phil Taylor** **Canberra**
Signature	
Date:	**05/06/2018**

Appendix E – Reported abnormalities

Photographic Evidence. Report : 601574

Client ID: 212558316_GIRTRI__02_1_290518

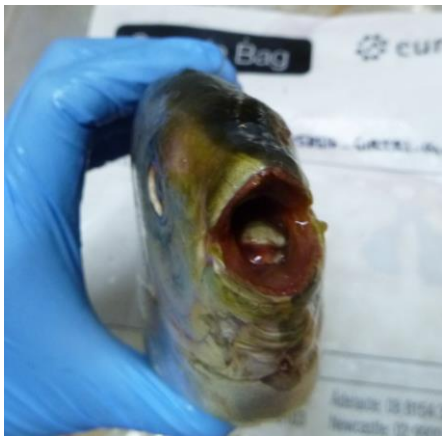
Composite ID: 212558316_GIRTRI__(1-5)_1_290518

Eurofins sample ID: Jn04388

Client ID: 212558316_GIRTRI__04_1_290518

Composite ID: 212558316_GIRTRI__(1-5)_1_290518

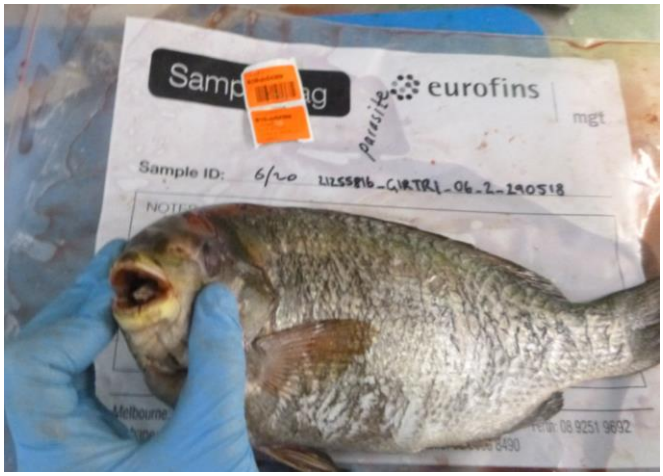
Eurofins sample ID: Jn04388



Client ID: 212558316_GIRTRI__06_2_290518

Composite ID: 212558316_GIRTRI__(6-10)_2_290518

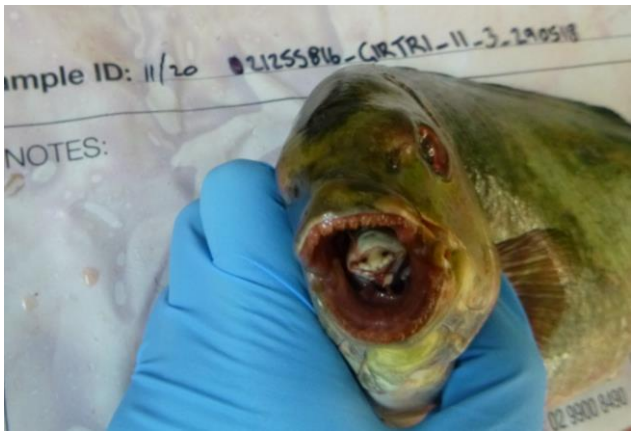
Eurofins sample ID: Jn04389



Client ID: 212558316_GIRTRI__11_3_290518

Composite ID: 212558316_GIRTRI__(11-15)_3_290518

Eurofins sample ID: Jn04390



Client ID: 212558316_GIRTRI__13_3_290518

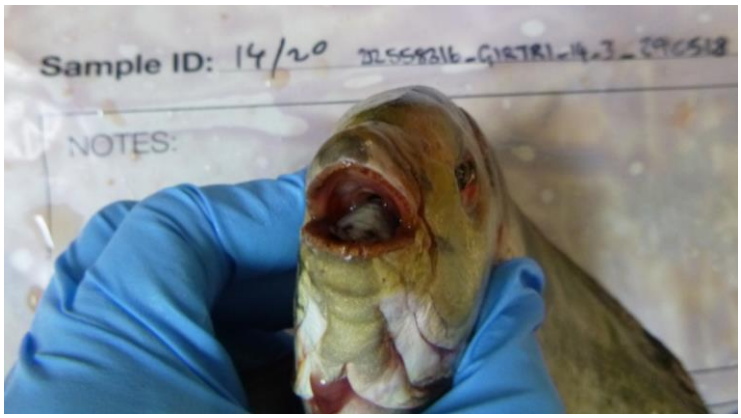
Composite ID: 212558316_GIRTRI__(11-15)_3_290518

Eurofins sample ID: Jn04390

Client ID: 212558316_GIRTRI__14_3_290518

Composite ID: 212558316_GIRTRI__(11-15)_3_290518

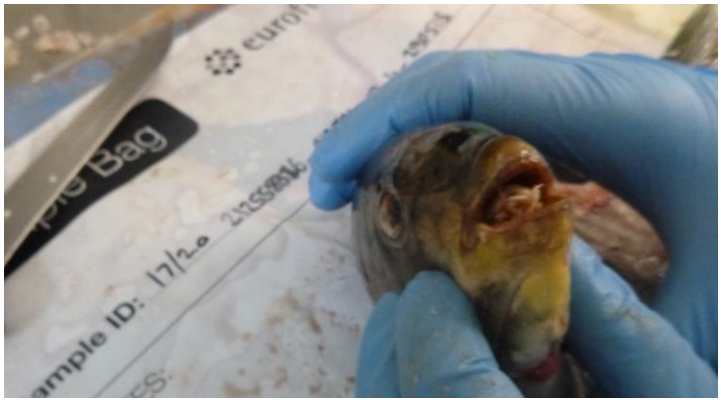
Eurofins sample ID: Jn04390



Client ID: 212558316_GIRTRI__17_4_290518

Composite ID: 212558316_GIRTRI__(16-20)_4_290518

Eurofins sample ID: Jn04391



Appendix F – Analytical Laboratory Reports

Certificate of Analysis

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Phil Taylor**

Report **601574-W**
Project name LAKE ILLAWARRA SAMPLES
Project ID 212558316
Received Date Jun 01, 2018

Client Sample ID			**R1 - KNIFE RINSATE**	**R2 - CHOPPING BOARD RINSATE**	**R3 - NET RINSATE**	**TB1 - TRIP BLANK BOAT**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**B18-Jn04396**	**B18-Jn04397**	**B18-Jn04398**	**B18-Jn04399**
Date Sampled			**May 29, 2018**	**May 30, 2018**	**May 31, 2018**	**May 29, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	77	74	83	84
13C5-PFPeA (surr.)	1	%	83	87	87	93
13C5-PFHxA (surr.)	1	%	87	86	91	94
13C4-PFHpA (surr.)	1	%	79	81	83	86
13C8-PFOA (surr.)	1	%	84	84	88	90
13C5-PFNA (surr.)	1	%	88	91	91	94
13C6-PFDA (surr.)	1	%	89	90	95	93
13C2-PFUnDA (surr.)	1	%	86	89	84	89
13C2-PFDoDA (surr.)	1	%	78	80	75	81
13C2-PFTeDA (surr.)	1	%	65	65	60	64
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	71	76	77	76

Client Sample ID			R1 - KNIFE RINSATE	R2 - CHOPPING BOARD RINSATE	R3 - NET RINSATE	TB1 - TRIP BLANK BOAT
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**B18-Jn04396**	**B18-Jn04397**	**B18-Jn04398**	**B18-Jn04399**
Date Sampled			**May 29, 2018**	**May 30, 2018**	**May 31, 2018**	**May 29, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D3-N-MeFOSA (surr.)	1	%	51	60	57	55
D5-N-EtFOSA (surr.)	1	%	56	66	64	63
D7-N-MeFOSE (surr.)	1	%	48	54	47	49
D9-N-EtFOSE (surr.)	1	%	39	46	42	41
D5-N-EtFOSAA (surr.)	1	%	92	93	89	99
D3-N-MeFOSAA (surr.)	1	%	58	58	60	65
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	98	97	97	99
18O2-PFHxS (surr.)	1	%	94	93	93	97
13C8-PFOS (surr.)	1	%	104	105	105	104
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	99	104	92	112
13C2-6:2 FTSA (surr.)	1	%	84	92	75	96
13C2-8:2 FTSA (surr.)	1	%	86	110	79	110
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of WA DER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=28)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			TB2 - TRIP BLANK BOAT	TB3 - TRIP BLANK FIELD	WQ1 - LAKE DAY 1	WQ1DUP - LAKE DAY 1
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**B18-Jn04400**	**B18-Jn04401**	**B18-Jn04402**	**B18-Jn04403**
Date Sampled			**May 30, 2018**	**May 31, 2018**	**May 29, 2018**	**May 29, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01

Client Sample ID			TB2 - TRIP BLANK BOAT	TB3 - TRIP BLANK FIELD	WQ1 - LAKE DAY 1	WQ1DUP - LAKE DAY 1
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**B18-Jn04400**	**B18-Jn04401**	**B18-Jn04402**	**B18-Jn04403**
Date Sampled			**May 30, 2018**	**May 31, 2018**	**May 29, 2018**	**May 29, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	83	82	54	55
13C5-PFPeA (surr.)	1	%	87	97	53	52
13C5-PFHxA (surr.)	1	%	91	91	57	50
13C4-PFHpA (surr.)	1	%	83	83	52	46
13C8-PFOA (surr.)	1	%	86	89	54	47
13C5-PFNA (surr.)	1	%	90	91	58	51
13C6-PFDA (surr.)	1	%	88	86	56	56
13C2-PFUnDA (surr.)	1	%	84	85	57	49
13C2-PFDoDA (surr.)	1	%	76	76	53	44
13C2-PFTeDA (surr.)	1	%	58	64	48	39
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	78	79	84	77
D3-N-MeFOSA (surr.)	1	%	53	52	59	48
D5-N-EtFOSA (surr.)	1	%	56	58	64	54
D7-N-MeFOSE (surr.)	1	%	55	46	46	41
D9-N-EtFOSE (surr.)	1	%	43	41	39	33
D5-N-EtFOSAA (surr.)	1	%	86	88	58	58
D3-N-MeFOSAA (surr.)	1	%	54	56	37	34
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	99	96	83	79
18O2-PFHxS (surr.)	1	%	96	95	84	82
13C8-PFOS (surr.)	1	%	108	105	95	92

Client Sample ID			TB2 - TRIP BLANK BOAT	TB3 - TRIP BLANK FIELD	WQ1 - LAKE DAY 1	WQ1DUP - LAKE DAY 1
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			B18-Jn04400	B18-Jn04401	B18-Jn04402	B18-Jn04403
Date Sampled			May 30, 2018	May 31, 2018	May 29, 2018	May 29, 2018
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	95	94	24	19
13C2-6:2 FTSA (surr.)	1	%	85	85	24	20
13C2-8:2 FTSA (surr.)	1	%	92	87	24	22
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of WA DER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=28)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			WQ2 - LAKE DAY 1	WQ2DUP - LAKE DAY 1	WQ3 - MUD ARK LOCATION	WQ3DUP - MUD ARK LOCATION
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			B18-Jn04404	B18-Jn04405	B18-Jn04406	B18-Jn04407
Date Sampled			May 29, 2018	May 29, 2018	May 29, 2018	May 29, 2018
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	51	46	51	52
13C5-PFPeA (surr.)	1	%	48	47	59	53
13C5-PFHxA (surr.)	1	%	44	46	53	50
13C4-PFHpA (surr.)	1	%	42	44	50	47
13C8-PFOA (surr.)	1	%	42	45	51	48
13C5-PFNA (surr.)	1	%	46	50	55	52
13C6-PFDA (surr.)	1	%	45	49	51	53
13C2-PFUnDA (surr.)	1	%	45	51	49	48
13C2-PFDoDA (surr.)	1	%	41	42	43	42
13C2-PFTeDA (surr.)	1	%	33	40	39	39

Client Sample ID			WQ2 - LAKE DAY 1	WQ2DUP - LAKE DAY 1	WQ3 - MUD ARK LOCATION	WQ3DUP - MUD ARK LOCATION
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**B18-Jn04404**	**B18-Jn04405**	**B18-Jn04406**	**B18-Jn04407**
Date Sampled			**May 29, 2018**	**May 29, 2018**	**May 29, 2018**	**May 29, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	66	78	82	79
D3-N-MeFOSA (surr.)	1	%	31	44	46	43
D5-N-EtFOSA (surr.)	1	%	36	50	52	48
D7-N-MeFOSE (surr.)	1	%	29	38	39	36
D9-N-EtFOSE (surr.)	1	%	26	32	34	30
D5-N-EtFOSAA (surr.)	1	%	63	58	43	56
D3-N-MeFOSAA (surr.)	1	%	36	35	26	36
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	76	74	82	81
18O2-PFHxS (surr.)	1	%	79	79	82	82
13C8-PFOS (surr.)	1	%	89	95	90	93
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	18	19	23	21
13C2-6:2 FTSA (surr.)	1	%	22	21	22	24
13C2-8:2 FTSA (surr.)	1	%	25	26	21	22
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of WA DER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=28)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			WQ4 - FIELD BLANK	WQ5 - FIELD BLANK	WQ6 - KOONA BAY	WQ6DUP - KOONA BAY
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**B18-Jn04408**	**B18-Jn04409**	**B18-Jn04410**	**B18-Jn04411**
Date Sampled			**May 29, 2018**	**May 29, 2018**	**May 31, 2018**	**May 31, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	74	79	53	52
13C5-PFPeA (surr.)	1	%	86	90	55	47
13C5-PFHxA (surr.)	1	%	82	88	53	48
13C4-PFHpA (surr.)	1	%	75	81	49	46
13C8-PFOA (surr.)	1	%	80	86	51	47
13C5-PFNA (surr.)	1	%	88	92	55	52
13C6-PFDA (surr.)	1	%	86	95	52	47
13C2-PFUnDA (surr.)	1	%	85	86	49	47
13C2-PFDoDA (surr.)	1	%	76	78	44	42
13C2-PFTeDA (surr.)	1	%	61	59	38	37
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	75	82	82	81
D3-N-MeFOSA (surr.)	1	%	54	54	49	45
D5-N-EtFOSA (surr.)	1	%	62	57	51	47
D7-N-MeFOSE (surr.)	1	%	52	50	41	39
D9-N-EtFOSE (surr.)	1	%	42	44	33	31
D5-N-EtFOSAA (surr.)	1	%	88	91	54	52
D3-N-MeFOSAA (surr.)	1	%	58	58	33	31
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	98	99	82	78
18O2-PFHxS (surr.)	1	%	95	96	86	83
13C8-PFOS (surr.)	1	%	105	108	92	92

Client Sample ID			WQ4 - FIELD BLANK	WQ5 - FIELD BLANK	WQ6 - KOONA BAY	WQ6DUP - KOONA BAY
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**B18-Jn04408**	**B18-Jn04409**	**B18-Jn04410**	**B18-Jn04411**
Date Sampled			**May 29, 2018**	**May 29, 2018**	**May 31, 2018**	**May 31, 2018**
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	90	97	20	20
13C2-6:2 FTSA (surr.)	1	%	77	81	22	21
13C2-8:2 FTSA (surr.)	1	%	94	88	25	27
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of WA DER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=28)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			WQ7 - KOONA BAY	WQ7DUP - KOONA BAY	WQ8 - KOONA BAY	WQ8DUP - KOONA BAY
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**B18-Jn04412**	**B18-Jn04413**	**B18-Jn04414**	**B18-Jn04415**
Date Sampled			**May 31, 2018**	**May 31, 2018**	**May 31, 2018**	**May 31, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	75	78	73	73
13C5-PFPeA (surr.)	1	%	80	79	78	77
13C5-PFHxA (surr.)	1	%	63	65	62	63
13C4-PFHpA (surr.)	1	%	60	62	59	60
13C8-PFOA (surr.)	1	%	61	59	62	59
13C5-PFNA (surr.)	1	%	64	73	88	74
13C6-PFDA (surr.)	1	%	53	64	76	58
13C2-PFUnDA (surr.)	1	%	52	57	61	52
13C2-PFDoDA (surr.)	1	%	51	58	57	50
13C2-PFTeDA (surr.)	1	%	43	54	49	45

Client Sample ID			WQ7 - KOONA BAY	WQ7DUP - KOONA BAY	WQ8 - KOONA BAY	WQ8DUP - KOONA BAY
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**B18-Jn04412**	**B18-Jn04413**	**B18-Jn04414**	**B18-Jn04415**
Date Sampled			**May 31, 2018**	**May 31, 2018**	**May 31, 2018**	**May 31, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	54	69	80	59
D3-N-MeFOSA (surr.)	1	%	53	76	56	60
D5-N-EtFOSA (surr.)	1	%	60	88	63	67
D7-N-MeFOSE (surr.)	1	%	41	53	57	37
D9-N-EtFOSE (surr.)	1	%	37	45	53	37
D5-N-EtFOSAA (surr.)	1	%	64	76	77	69
D3-N-MeFOSAA (surr.)	1	%	42	48	49	46
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	97	101	98	101
18O2-PFHxS (surr.)	1	%	87	92	91	89
13C8-PFOS (surr.)	1	%	53	61	82	59
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	68	63	54	73
13C2-6:2 FTSA (surr.)	1	%	63	50	54	58
13C2-8:2 FTSA (surr.)	1	%	41	35	47	50
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of WA DER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=28)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			R4 - EUROFINS LAB KNIFE RINSATE	R4 - EUROFINS LAB BLENDER RINSATE
Sample Matrix			**Water**	**Water**
Eurofins | mgt Sample No.			**B18-Jn04416**	**B18-Jn04417**
Date Sampled			**Jun 01, 2018**	**Jun 01, 2018**
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	85	45
13C5-PFPeA (surr.)	1	%	89	45
13C5-PFHxA (surr.)	1	%	69	36
13C4-PFHpA (surr.)	1	%	66	33
13C8-PFOA (surr.)	1	%	71	36
13C5-PFNA (surr.)	1	%	90	51
13C6-PFDA (surr.)	1	%	71	47
13C2-PFUnDA (surr.)	1	%	65	43
13C2-PFDoDA (surr.)	1	%	56	37
13C2-PFTeDA (surr.)	1	%	50	31
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	60	35
D3-N-MeFOSA (surr.)	1	%	64	40
D5-N-EtFOSA (surr.)	1	%	69	46
D7-N-MeFOSE (surr.)	1	%	40	26
D9-N-EtFOSE (surr.)	1	%	37	21
D5-N-EtFOSAA (surr.)	1	%	69	52
D3-N-MeFOSAA (surr.)	1	%	46	34
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	101	50

Client Sample ID			R4 - EUROFINS LAB KNIFE RINSATE	R4 - EUROFINS LAB BLENDER RINSATE
Sample Matrix			**Water**	**Water**
Eurofins | mgt Sample No.			**B18-Jn04416**	**B18-Jn04417**
Date Sampled			**Jun 01, 2018**	**Jun 01, 2018**
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonic acids (PFSAs)				
18O2-PFHxS (surr.)	1	%	96	46
13C8-PFOS (surr.)	1	%	67	42
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	93	30
13C2-6:2 FTSA (surr.)	1	%	97	34
13C2-8:2 FTSA (surr.)	1	%	64	46
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01
Sum of WA DER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05
Sum of PFASs (n=28)*	0.1	ug/L	< 0.1	< 0.1

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Jun 05, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Jun 05, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Jun 05, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Jun 05, 2018	14 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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NATA # 1261
Site # 23736

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: LAKE ILLAWARRA SAMPLES
Project ID: 212558316

Order No.:
Report #: 601574
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Jun 1, 2018 1:17 PM
Due: Jun 15, 2018
Priority: 10 Day
Contact Name: Phil Taylor

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	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	212558316_PLAFUS_(1-5)_1_290518	May 29, 2018		Fish	B18-Jn04372			X
2	212558316_PLAFUS_(6-10)_2_290518	May 29, 2018		Fish	B18-Jn04373			X
3	212558316_PLAFUS_(11-15)_3_290518	May 29, 2018		Fish	B18-Jn04374			X
4	212558316_PLAFUS_(16-20)_4_290518	May 29, 2018		Fish	B18-Jn04375			X

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Company Name:	GHD Pty Ltd NSW	**Order No.:**	
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Project ID:	212558316		

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Sample Detail						HOLD	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								
5	212558316_MUGCEP_(1-5)_1_290518	May 29, 2018		Fish	B18-Jn04376			X
6	212558316_MUGCEP_(6-10)_2_290518	May 29, 2018		Fish	B18-Jn04377			X
7	212558316_MUGCEP_(11-15)_3_290518	May 29, 2018		Fish	B18-Jn04378			X
8	212558316_MUGCEP_(16-20)_4_290518	May 29, 2018		Fish	B18-Jn04379			X
9	212558316_ANATRA_(1-5)_1_290518	May 29, 2018		Fish	B18-Jn04380			X

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Sample Detail						HOLD	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								
10	212558316_ANATRA_(6-10)_2_290518	May 29, 2018		Fish	B18-Jn04381			X
11	212558316_ANATRA_(11-15)_3_290518	May 29, 2018		Fish	B18-Jn04382			X
12	212558316_ANATRA_(16-20)_4_290518	May 29, 2018		Fish	B18-Jn04383			X
13	212558316_ACAAUS_(1-5)_1_290518	May 29, 2018		Fish	B18-Jn04384			X
14	212558316_ACAAUS_(6-10)_2_290518	May 29, 2018		Fish	B18-Jn04385			X

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Sample Detail						HOLD	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								
15	212558316_ACAAUS_(11-15)_3_290518	May 29, 2018		Fish	B18-Jn04386			X
16	212558316_ACAAUS_(16-20)_4_290518	May 29, 2018		Fish	B18-Jn04387			X
17	212558316_GIRTTRI_(1-5)_1_290518	May 29, 2018		Fish	B18-Jn04388			X
18	212558316_GIRTTRI_(6-10)_2_290518	May 29, 2018		Fish	B18-Jn04389			X
19	212558316_GIRTTRI_(11-15)_3_290518	May 29, 2018		Fish	B18-Jn04390			X

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Project ID:	212558316		

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Sample Detail						HOLD	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								
20	212558316_GIRTTRI_(16-20)_4_290518	May 29, 2018		Fish	B18-Jn04391			X
21	212558316_PORARM_(1-5)_1_290518	May 29, 2018		Fish	B18-Jn04392			X
22	212558316_PORARM_(6-10)_2_290518	May 29, 2018		Fish	B18-Jn04393			X
23	212558316_PORARM_(11-15)_3_290518	May 29, 2018		Fish	B18-Jn04394			X
24	212558316_PORARM_(16-20)_4_290518	May 29, 2018		Fish	B18-Jn04395			X

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Project Name: LAKE ILLAWARRA SAMPLES
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Sample Detail						HOLD	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								
25	R1 - KNIFE RINSATE	May 29, 2018		Water	B18-Jn04396			X
26	R2 - CHOPPING BOARD RINSATE	May 30, 2018	4:05PM	Water	B18-Jn04397			X
27	R3 - NET RINSATE	May 31, 2018		Water	B18-Jn04398			X
28	TB1 - TRIP BLANK BOAT	May 29, 2018		Water	B18-Jn04399			X
29	TB2 - TRIP BLANK BOAT	May 30, 2018		Water	B18-Jn04400			X
30	TB3 - TRIP BLANK FIELD	May 31, 2018		Water	B18-Jn04401			X
31	WQ1 - LAKE	May 29, 2018	4:30PM	Water	B18-Jn04402			X

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Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	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								
	DAY 1							
32	WQ1DUP - LAKE DAY 1	May 29, 2018	4:30PM	Water	B18-Jn04403			X
33	WQ2 - LAKE DAY 1	May 29, 2018	5:05PM	Water	B18-Jn04404			X
34	WQ2DUP - LAKE DAY 1	May 29, 2018	5:05PM	Water	B18-Jn04405			X
35	WQ3 - MUD ARK LOCATION	May 29, 2018	8:05PM	Water	B18-Jn04406			X
36	WQ3DUP - MUD ARK LOCATION	May 29, 2018	8:05PM	Water	B18-Jn04407			X
37	WQ4 - FIELD BLANK	May 29, 2018	4:40PM	Water	B18-Jn04408			X

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Company Name: GHD Pty Ltd NSW
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Project Name: LAKE ILLAWARRA SAMPLES
Project ID: 212558316

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Sample Detail						HOLD	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								
38	WQ5 - FIELD BLANK	May 29, 2018	4:40PM	Water	B18-Jn04409			X
39	WQ6 - KOONA BAY	May 31, 2018	10:15AM	Water	B18-Jn04410			X
40	WQ6DUP - KOONA BAY	May 31, 2018	10:15AM	Water	B18-Jn04411			X
41	WQ7 - KOONA BAY	May 31, 2018	10:40AM	Water	B18-Jn04412			X
42	WQ7DUP - KOONA BAY	May 31, 2018	10:40AM	Water	B18-Jn04413			X
43	WQ8 - KOONA BAY	May 31, 2018	11:10AM	Water	B18-Jn04414			X
44	WQ8DUP - KOONA BAY	May 31, 2018	11:10AM	Water	B18-Jn04415			X

eurofins | mgt

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NATA # 1261
Site # 23736

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: LAKE ILLAWARRA SAMPLES
Project ID: 212558316

Order No.:
Report #: 601574
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Jun 1, 2018 1:17 PM
Due: Jun 15, 2018
Priority: 10 Day
Contact Name: Phil Taylor

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	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								
45	R4 - EUROFINS LAB KNIFE RINSATE	Jun 01, 2018		Water	B18-Jn04416			X
46	R4 - EUROFINS LAB BLENDER RINSATE	Jun 01, 2018		Water	B18-Jn04417			X
47	SED1	May 31, 2018		Soil	B18-Jn04602		X	X
48	SED1DUP	May 31, 2018		Soil	B18-Jn04603		X	X
49	SED2	May 31, 2018		Soil	B18-Jn04604		X	X
50	SED2DUP	May 31, 2018		Soil	B18-Jn04605		X	X
51	SED3	May 31, 2018		Soil	B18-Jn04606		X	X

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NATA # 1261 Site # 20794

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

Company Name:	GHD Pty Ltd NSW	**Order No.:**		**Received:**	Jun 1, 2018 1:17 PM
Address:	Level 15, 133 Castlereagh Street Sydney NSW 2000	**Report #:**	601574	**Due:**	Jun 15, 2018
		Phone:	02 9239 7100	**Priority:**	10 Day
		Fax:	02 9239 7199	**Contact Name:**	Phil Taylor
Project Name:	LAKE ILLAWARRA SAMPLES				
Project ID:	212558316				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	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								
52	SED3DUP	May 31, 2018		Soil	B18-Jn04607		X	X
53	SED4	May 31, 2018		Soil	B18-Jn04608		X	X
54	SED4DUP	May 31, 2018		Soil	B18-Jn04609		X	X
55	212558316_MUGCEP_12_3_290518	May 29, 2018		Fish	B18-Jn04611	X		
Test Counts						1	8	54

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	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	101			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	124			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	103			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	103			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	106			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	104			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	101			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	108			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	102			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	90			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	105			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctane sulfonamide (FOSA)	%	103			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	102			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	104			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)	%	96			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	91			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	98			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	83			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	89			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	93			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	103			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	99			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	93			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	98			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	106			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)	%	83			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-Jn04397	CP	%	99			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B18-Jn04397	CP	%	98			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B18-Jn04397	CP	%	97			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-Jn04397	CP	%	95			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B18-Jn04397	CP	%	96			50-150	Pass	
Perfluorononanoic acid (PFNA)	B18-Jn04397	CP	%	96			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B18-Jn04397	CP	%	97			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-Jn04397	CP	%	96			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-Jn04397	CP	%	103			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-Jn04397	CP	%	92			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B18-Jn04397	CP	%	109			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B18-Jn04397	CP	%	98			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Jn04397	CP	%	98			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Jn04397	CP	%	103			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Jn04397	CP	%	95			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Jn04397	CP	%	100			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Jn04397	CP	%	88			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Jn04397	CP	%	84			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-Jn04397	CP	%	81			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B18-Jn04397	CP	%	85			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B18-Jn04397	CP	%	82			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B18-Jn04397	CP	%	83			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B18-Jn04397	CP	%	96			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B18-Jn04397	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-Jn04397	CP	%	86			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Jn04397	CP	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Jn04397	CP	%	112			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Jn04397	CP	%	88			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B18-Jn04413	CP	%	92			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B18-Jn04413	CP	%	110			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B18-Jn04413	CP	%	94			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-Jn04413	CP	%	95			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B18-Jn04413	CP	%	93			50-150	Pass	
Perfluorononanoic acid (PFNA)	B18-Jn04413	CP	%	87			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B18-Jn04413	CP	%	92			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-Jn04413	CP	%	82			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-Jn04413	CP	%	78			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-Jn04413	CP	%	75			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B18-Jn04413	CP	%	84			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B18-Jn04413	CP	%	85			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Jn04413	CP	%	93			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Jn04413	CP	%	85			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Jn04413	CP	%	76			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Jn04413	CP	%	83			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Jn04413	CP	%	70			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Jn04413	CP	%	76			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-Jn04413	CP	%	84			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B18-Jn04413	CP	%	97			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B18-Jn04413	CP	%	90			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B18-Jn04413	CP	%	80			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B18-Jn04413	CP	%	79			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B18-Jn04413	CP	%	85			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-Jn04413	CP	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Jn04413	CP	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Jn04413	CP	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Jn04413	CP	%	82			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)	B18-Jn04396	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B18-Jn04396	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B18-Jn04396	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-Jn04396	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B18-Jn04396	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B18-Jn04396	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B18-Jn04396	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-Jn04396	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-Jn04396	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-Jn04396	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B18-Jn04396	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B18-Jn04396	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Jn04396	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Jn04396	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Jn04396	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Jn04396	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Jn04396	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Jn04396	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B18-Jn04396	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B18-Jn04396	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B18-Jn04396	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B18-Jn04396	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B18-Jn04396	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B18-Jn04396	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-Jn04396	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Jn04396	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Jn04396	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Jn04396	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B18-Jn04398	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B18-Jn04398	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B18-Jn04398	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-Jn04398	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B18-Jn04398	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B18-Jn04398	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B18-Jn04398	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-Jn04398	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-Jn04398	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-Jn04398	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B18-Jn04398	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B18-Jn04398	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Jn04398	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Jn04398	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Jn04398	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Jn04398	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Jn04398	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Jn04398	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B18-Jn04398	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B18-Jn04398	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B18-Jn04398	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B18-Jn04398	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B18-Jn04398	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B18-Jn04398	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-Jn04398	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Jn04398	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Jn04398	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Jn04398	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B18-Jn04412	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B18-Jn04412	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B18-Jn04412	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-Jn04412	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B18-Jn04412	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B18-Jn04412	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B18-Jn04412	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-Jn04412	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-Jn04412	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-Jn04412	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B18-Jn04412	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B18-Jn04412	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Jn04412	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Jn04412	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Jn04412	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Jn04412	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Jn04412	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Jn04412	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B18-Jn04412	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B18-Jn04412	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B18-Jn04412	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B18-Jn04412	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B18-Jn04412	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B18-Jn04412	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-Jn04412	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Jn04412	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Jn04412	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Jn04412	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
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

Nibha Vaidya	Analytical Services Manager
Jonathon Angell	Senior Analyst-Organic (QLD)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

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Attention: **Phil Taylor**

Report **601574-S-V2**
Project name LAKE ILLAWARRA SAMPLES
Project ID 212558316
Received Date Jun 01, 2018

Client Sample ID			**212558316_PLAFUS_(1-5)_1_290518**	**212558316_PLAFUS_(6-10)_2_290518**	**212558316_PLAFUS_(11-15)_3_290518**	**212558316_PLAFUS_(16-20)_4_290518**
Sample Matrix			**Fish**	**Fish**	**Fish**	**Fish**
Eurofins | mgt Sample No.			**B18-Jn04372**	**B18-Jn04373**	**B18-Jn04374**	**B18-Jn04375**
Date Sampled			**May 29, 2018**	**May 29, 2018**	**May 29, 2018**	**May 29, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoropentanoic acid (PFPeA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorohexanoic acid (PFHxA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoroheptanoic acid (PFHpA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorooctanoic acid (PFOA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorononanoic acid (PFNA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorodecanoic acid (PFDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoroundecanoic acid (PFUnDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorododecanoic acid (PFDoDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorotridecanoic acid (PFTrDA)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C4-PFBA (surr.)	1	%	75	74	71	74
13C5-PFPeA (surr.)	1	%	67	62	62	61
13C5-PFHxA (surr.)	1	%	66	65	63	67
13C4-PFHpA (surr.)	1	%	63	61	61	63
13C8-PFOA (surr.)	1	%	65	60	60	64
13C5-PFNA (surr.)	1	%	68	62	63	68
13C6-PFDA (surr.)	1	%	63	62	61	66
13C2-PFUnDA (surr.)	1	%	52	50	50	55
13C2-PFDoDA (surr.)	1	%	48	46	49	49
13C2-PFTeDA (surr.)	1	%	43	31	39	43
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C8-FOSA (surr.)	1	%	64	62	62	66
D3-N-MeFOSA (surr.)	1	%	61	60	49	48

Client Sample ID			212558316_PLAFUS_(1-5)_1_290518	212558316_PLAFUS_(6-10)_2_290518	212558316_PLAFUS_(11-15)_3_290518	212558316_PLAFUS_(16-20)_4_290518
Sample Matrix			**Fish**	**Fish**	**Fish**	**Fish**
Eurofins | mgt Sample No.			**B18-Jn04372**	**B18-Jn04373**	**B18-Jn04374**	**B18-Jn04375**
Date Sampled			**May 29, 2018**	**May 29, 2018**	**May 29, 2018**	**May 29, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D5-N-EtFOSA (surr.)	1	%	96	93	73	71
D7-N-MeFOSE (surr.)	1	%	36	30	29	30
D9-N-EtFOSE (surr.)	1	%	29	26	27	27
D5-N-EtFOSAA (surr.)	1	%	71	66	66	76
D3-N-MeFOSAA (surr.)	1	%	89	90	87	91
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.3	ug/kg	< 0.3	< 0.3	< 0.3	< 0.3
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorooctanesulfonic acid (PFOS)[N11]	0.3	ug/kg	[N09]0.5	[N09]0.7	[N09]0.8	[N09]1.0
Perfluorodecanesulfonic acid (PFDS)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C3-PFBS (surr.)	1	%	85	85	85	86
18O2-PFHxS (surr.)	1	%	84	76	81	84
13C8-PFOS (surr.)	1	%	61	70	69	70
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C2-4:2 FTSA (surr.)	1	%	73	79	73	80
13C2-6:2 FTSA (surr.)	1	%	67	65	60	69
13C2-8:2 FTSA (surr.)	1	%	60	57	54	58
PFASs Summations						
Sum (PFHxS + PFOS)*	0.5	ug/kg	0.5	0.7	0.8	1
Sum of US EPA PFAS (PFOS + PFOA)*	0.5	ug/kg	0.5	0.7	0.8	1
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.5	ug/kg	0.5	0.7	0.8	1
Sum of WA DER PFAS (n=10)*	0.5	ug/kg	0.5	0.7	0.8	1
Sum of PFASs (n=28)*	0.5	ug/kg	0.5	0.7	0.8	1

Client Sample ID			212558316_MUGCEP_(1-5)_1_290518	212558316_MUGCEP_(6-10)_2_290518	212558316_MUGCEP_(11-15)_3_290518	212558316_MUGCEP_(16-20)_4_290518
Sample Matrix			**Fish**	**Fish**	**Fish**	**Fish**
Eurofins | mgt Sample No.			**B18-Jn04376**	**B18-Jn04377**	**B18-Jn04378**	**B18-Jn04379**
Date Sampled			**May 29, 2018**	**May 29, 2018**	**May 29, 2018**	**May 29, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoropentanoic acid (PFPeA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorohexanoic acid (PFHxA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoroheptanoic acid (PFHpA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorooctanoic acid (PFOA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorononanoic acid (PFNA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorodecanoic acid (PFDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			212558316_MUGCEP_(1-5)_1_290518	212558316_MUGCEP_(6-10)_2_290518	212558316_MUGCEP_(11-15)_3_290518	212558316_MUGCEP_(16-20)_4_290518
Sample Matrix			**Fish**	**Fish**	**Fish**	**Fish**
Eurofins | mgt Sample No.			**B18-Jn04376**	**B18-Jn04377**	**B18-Jn04378**	**B18-Jn04379**
Date Sampled			**May 29, 2018**	**May 29, 2018**	**May 29, 2018**	**May 29, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluoroundecanoic acid (PFUnDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorododecanoic acid (PFDoDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorotridecanoic acid (PFTrDA)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C4-PFBA (surr.)	1	%	74	71	69	69
13C5-PFPeA (surr.)	1	%	62	60	58	64
13C5-PFHxA (surr.)	1	%	67	64	61	61
13C4-PFHpA (surr.)	1	%	65	62	59	61
13C8-PFOA (surr.)	1	%	69	64	59	61
13C5-PFNA (surr.)	1	%	69	66	64	64
13C6-PFDA (surr.)	1	%	82	78	73	73
13C2-PFUnDA (surr.)	1	%	81	79	74	73
13C2-PFDoDA (surr.)	1	%	96	99	99	79
13C2-PFTeDA (surr.)	1	%	79	103	94	57
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C8-FOSA (surr.)	1	%	82	83	81	72
D3-N-MeFOSA (surr.)	1	%	58	57	54	53
D5-N-EtFOSA (surr.)	1	%	96	97	91	87
D7-N-MeFOSE (surr.)	1	%	38	43	46	37
D9-N-EtFOSE (surr.)	1	%	21	22	18	22
D5-N-EtFOSAA (surr.)	1	%	151	147	142	142
D3-N-MeFOSAA (surr.)	1	%	60	66	74	77
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.3	ug/kg	< 0.3	< 0.3	< 0.3	< 0.3
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorooctanesulfonic acid (PFOS)[N11]	0.3	ug/kg	[N09]1.0	[N09]0.9	[N09]0.8	[N09]0.9
Perfluorodecanesulfonic acid (PFDS)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C3-PFBS (surr.)	1	%	86	83	81	83
18O2-PFHxS (surr.)	1	%	82	81	79	78
13C8-PFOS (surr.)	1	%	77	76	72	75

Client Sample ID			212558316_MUGCEP_(1-5)_1_290518	212558316_MUGCEP_(6-10)_2_290518	212558316_MUGCEP_(11-15)_3_290518	212558316_MUGCEP_(16-20)_4_290518
Sample Matrix			**Fish**	**Fish**	**Fish**	**Fish**
Eurofins | mgt Sample No.			**B18-Jn04376**	**B18-Jn04377**	**B18-Jn04378**	**B18-Jn04379**
Date Sampled			**May 29, 2018**	**May 29, 2018**	**May 29, 2018**	**May 29, 2018**
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C2-4:2 FTSA (surr.)	1	%	68	70	67	64
13C2-6:2 FTSA (surr.)	1	%	67	68	64	66
13C2-8:2 FTSA (surr.)	1	%	69	63	60	63
PFASs Summations						
Sum (PFHxS + PFOS)*	0.5	ug/kg	1	0.9	0.8	0.9
Sum of US EPA PFAS (PFOS + PFOA)*	0.5	ug/kg	1	0.9	0.8	0.9
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.5	ug/kg	1	0.9	0.8	0.9
Sum of WA DER PFAS (n=10)*	0.5	ug/kg	1	0.9	0.8	0.9
Sum of PFASs (n=28)*	0.5	ug/kg	1	0.9	0.8	0.9

Client Sample ID			212558316_ANATRA_(1-5)_1_290518	212558316_ANATRA_(6-10)_2_290518	212558316_ANATRA_(11-15)_3_290518	212558316_ANATRA_(16-20)_4_290518
Sample Matrix			**Fish**	**Fish**	**Fish**	**Fish**
Eurofins | mgt Sample No.			**B18-Jn04380**	**B18-Jn04381**	**B18-Jn04382**	**B18-Jn04383**
Date Sampled			**May 29, 2018**	**May 29, 2018**	**May 29, 2018**	**May 29, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoropentanoic acid (PFPeA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorohexanoic acid (PFHxA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoroheptanoic acid (PFHpA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorooctanoic acid (PFOA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorononanoic acid (PFNA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorodecanoic acid (PFDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoroundecanoic acid (PFUnDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorododecanoic acid (PFDoDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorotridecanoic acid (PFTrDA)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C4-PFBA (surr.)	1	%	75	77	78	75
13C5-PFPeA (surr.)	1	%	66	67	76	64
13C5-PFHxA (surr.)	1	%	72	71	75	72
13C4-PFHpA (surr.)	1	%	71	64	73	69
13C8-PFOA (surr.)	1	%	71	65	73	69
13C5-PFNA (surr.)	1	%	82	79	84	79
13C6-PFDA (surr.)	1	%	79	81	81	77
13C2-PFUnDA (surr.)	1	%	64	84	68	68
13C2-PFDoDA (surr.)	1	%	61	98	60	65
13C2-PFTeDA (surr.)	1	%	35	63	33	41

Client Sample ID			212558316_ANATRA_(1-5)_1_290518	212558316_ANATRA_(6-10)_2_290518	212558316_ANATRA_(11-15)_3_290518	212558316_ANATRA_(16-20)_4_290518
Sample Matrix			**Fish**	**Fish**	**Fish**	**Fish**
Eurofins | mgt Sample No.			**B18-Jn04380**	**B18-Jn04381**	**B18-Jn04382**	**B18-Jn04383**
Date Sampled			**May 29, 2018**	**May 29, 2018**	**May 29, 2018**	**May 29, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C8-FOSA (surr.)	1	%	65	64	58	62
D3-N-MeFOSA (surr.)	1	%	62	53	60	59
D5-N-EtFOSA (surr.)	1	%	101	102	101	110
D7-N-MeFOSE (surr.)	1	%	33	31	30	33
D9-N-EtFOSE (surr.)	1	%	30	27	27	27
D5-N-EtFOSAA (surr.)	1	%	110	135	104	127
D3-N-MeFOSAA (surr.)	1	%	86	94	85	83
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.3	ug/kg	< 0.3	< 0.3	< 0.3	< 0.3
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorooctanesulfonic acid (PFOS)[N11]	0.3	ug/kg	< 0.3	< 0.3	< 0.3	< 0.3
Perfluorodecanesulfonic acid (PFDS)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C3-PFBS (surr.)	1	%	83	77	83	77
18O2-PFHxS (surr.)	1	%	82	75	84	77
13C8-PFOS (surr.)	1	%	74	73	78	72
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C2-4:2 FTSA (surr.)	1	%	94	99	93	91
13C2-6:2 FTSA (surr.)	1	%	103	121	111	102
13C2-8:2 FTSA (surr.)	1	%	69	96	78	73
PFASs Summations						
Sum (PFHxS + PFOS)*	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Sum of US EPA PFAS (PFOS + PFOA)*	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Sum of WA DER PFAS (n=10)*	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Sum of PFASs (n=28)*	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			212558316_ACAAUS_(1-5)_1_290518	212558316_ACAAUS_(6-10)_2_290518	212558316_ACAAUS_(11-15)_3_290518	212558316_ACAAUS_(16-20)_4_290518
Sample Matrix			**Fish**	**Fish**	**Fish**	**Fish**
Eurofins | mgt Sample No.			**B18-Jn04384**	**B18-Jn04385**	**B18-Jn04386**	**B18-Jn04387**
Date Sampled			**May 29, 2018**	**May 29, 2018**	**May 29, 2018**	**May 29, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoropentanoic acid (PFPeA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorohexanoic acid (PFHxA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoroheptanoic acid (PFHpA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorooctanoic acid (PFOA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorononanoic acid (PFNA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorodecanoic acid (PFDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoroundecanoic acid (PFUnDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorododecanoic acid (PFDoDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorotridecanoic acid (PFTrDA)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C4-PFBA (surr.)	1	%	73	71	72	68
13C5-PFPeA (surr.)	1	%	67	65	63	58
13C5-PFHxA (surr.)	1	%	66	65	65	61
13C4-PFHpA (surr.)	1	%	65	61	61	60
13C8-PFOA (surr.)	1	%	67	62	61	60
13C5-PFNA (surr.)	1	%	72	65	66	65
13C6-PFDA (surr.)	1	%	72	62	64	67
13C2-PFUnDA (surr.)	1	%	72	51	52	68
13C2-PFDoDA (surr.)	1	%	67	43	48	70
13C2-PFTeDA (surr.)	1	%	48	28	41	55
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C8-FOSA (surr.)	1	%	76	55	65	67
D3-N-MeFOSA (surr.)	1	%	65	45	46	45
D5-N-EtFOSA (surr.)	1	%	108	72	72	73
D7-N-MeFOSE (surr.)	1	%	36	27	30	28
D9-N-EtFOSE (surr.)	1	%	34	22	27	28
D5-N-EtFOSAA (surr.)	1	%	101	59	74	91
D3-N-MeFOSAA (surr.)	1	%	76	81	82	85
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.3	ug/kg	< 0.3	< 0.3	< 0.3	< 0.3
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorooctanesulfonic acid (PFOS)[N11]	0.3	ug/kg	< 0.3	< 0.3	< 0.3	< 0.3
Perfluorodecanesulfonic acid (PFDS)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C3-PFBS (surr.)	1	%	86	86	85	82
18O2-PFHxS (surr.)	1	%	82	80	81	79
13C8-PFOS (surr.)	1	%	81	71	71	79

Client Sample ID			212558316_ACAAUS_(1-5)_1_290518	212558316_ACAAUS_(6-10)_2_290518	212558316_ACAAUS_(11-15)_3_290518	212558316_ACAAUS_(16-20)_4_290518
Sample Matrix			**Fish**	**Fish**	**Fish**	**Fish**
Eurofins | mgt Sample No.			**B18-Jn04384**	**B18-Jn04385**	**B18-Jn04386**	**B18-Jn04387**
Date Sampled			**May 29, 2018**	**May 29, 2018**	**May 29, 2018**	**May 29, 2018**
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C2-4:2 FTSA (surr.)	1	%	81	76	73	66
13C2-6:2 FTSA (surr.)	1	%	70	65	58	64
13C2-8:2 FTSA (surr.)	1	%	60	58	57	59
PFASs Summations						
Sum (PFHxS + PFOS)*	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Sum of US EPA PFAS (PFOS + PFOA)*	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Sum of WA DER PFAS (n=10)*	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Sum of PFASs (n=28)*	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			212558316_GIRTTRI_(1-5)_1_290518	212558316_GIRTTRI_(6-10)_2_290518	212558316_GIRTTRI_(11-15)_3_290518	212558316_GIRTTRI_(16-20)_4_290518
Sample Matrix			**Fish**	**Fish**	**Fish**	**Fish**
Eurofins | mgt Sample No.			**B18-Jn04388**	**B18-Jn04389**	**B18-Jn04390**	**B18-Jn04391**
Date Sampled			**May 29, 2018**	**May 29, 2018**	**May 29, 2018**	**May 29, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoropentanoic acid (PFPeA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorohexanoic acid (PFHxA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoroheptanoic acid (PFHpA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorooctanoic acid (PFOA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorononanoic acid (PFNA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorodecanoic acid (PFDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoroundecanoic acid (PFUnDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorododecanoic acid (PFDoDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorotridecanoic acid (PFTrDA)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C4-PFBA (surr.)	1	%	69	68	63	69
13C5-PFPeA (surr.)	1	%	57	59	56	61
13C5-PFHxA (surr.)	1	%	67	63	59	64
13C4-PFHpA (surr.)	1	%	66	62	59	66
13C8-PFOA (surr.)	1	%	69	62	59	66
13C5-PFNA (surr.)	1	%	73	65	63	69
13C6-PFDA (surr.)	1	%	79	68	70	79
13C2-PFUnDA (surr.)	1	%	78	55	52	81
13C2-PFDoDA (surr.)	1	%	89	51	44	90
13C2-PFTeDA (surr.)	1	%	66	37	31	74

Client Sample ID			212558316_GIRTTRI_(1-5)_1_290518	212558316_GIRTTRI_(6-10)_2_290518	212558316_GIRTTRI_(11-15)_3_290518	212558316_GIRTTRI_(16-20)_4_290518
Sample Matrix			**Fish**	**Fish**	**Fish**	**Fish**
Eurofins | mgt Sample No.			**B18-Jn04388**	**B18-Jn04389**	**B18-Jn04390**	**B18-Jn04391**
Date Sampled			**May 29, 2018**	**May 29, 2018**	**May 29, 2018**	**May 29, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C8-FOSA (surr.)	1	%	79	69	67	84
D3-N-MeFOSA (surr.)	1	%	60	66	44	70
D5-N-EtFOSA (surr.)	1	%	111	100	64	127
D7-N-MeFOSE (surr.)	1	%	37	33	28	42
D9-N-EtFOSE (surr.)	1	%	27	32	26	34
D5-N-EtFOSAA (surr.)	1	%	141	105	92	149
D3-N-MeFOSAA (surr.)	1	%	85	82	79	87
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.3	ug/kg	< 0.3	< 0.3	< 0.3	< 0.3
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorooctanesulfonic acid (PFOS)[N11]	0.3	ug/kg	[N09]2.1	[N09]0.5	[N09]0.5	< 0.3
Perfluorodecanesulfonic acid (PFDS)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C3-PFBS (surr.)	1	%	82	84	83	86
18O2-PFHxS (surr.)	1	%	81	80	78	88
13C8-PFOS (surr.)	1	%	74	69	67	84
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C2-4:2 FTSA (surr.)	1	%	72	65	72	67
13C2-6:2 FTSA (surr.)	1	%	101	68	86	77
13C2-8:2 FTSA (surr.)	1	%	69	56	62	70
PFASs Summations						
Sum (PFHxS + PFOS)*	0.5	ug/kg	2.1	0.5	0.5	< 0.5
Sum of US EPA PFAS (PFOS + PFOA)*	0.5	ug/kg	2.1	0.5	0.5	< 0.5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.5	ug/kg	2.1	0.5	0.5	< 0.5
Sum of WA DER PFAS (n=10)*	0.5	ug/kg	2.1	0.5	0.5	< 0.5
Sum of PFASs (n=28)*	0.5	ug/kg	2.1	0.5	0.5	< 0.5

Client Sample ID			212558316_PORARM_(1-5)_1_290518	212558316_PORARM_(6-10)_2_290518	212558316_PORARM_(11-15)_3_290518	212558316_PORARM_(16-20)_4_290518
Sample Matrix			**Fish**	**Fish**	**Fish**	**Fish**
Eurofins | mgt Sample No.			**B18-Jn04392**	**B18-Jn04393**	**B18-Jn04394**	**B18-Jn04395**
Date Sampled			**May 29, 2018**	**May 29, 2018**	**May 29, 2018**	**May 29, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoropentanoic acid (PFPeA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorohexanoic acid (PFHxA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoroheptanoic acid (PFHpA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorooctanoic acid (PFOA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorononanoic acid (PFNA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorodecanoic acid (PFDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoroundecanoic acid (PFUnDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorododecanoic acid (PFDoDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorotridecanoic acid (PFTrDA)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C4-PFBA (surr.)	1	%	63	66	61	56
13C5-PFPeA (surr.)	1	%	43	60	44	43
13C5-PFHxA (surr.)	1	%	35	49	44	44
13C4-PFHpA (surr.)	1	%	48	58	53	51
13C8-PFOA (surr.)	1	%	60	63	57	57
13C5-PFNA (surr.)	1	%	66	72	67	66
13C6-PFDA (surr.)	1	%	76	78	81	77
13C2-PFUnDA (surr.)	1	%	64	73	72	66
13C2-PFDoDA (surr.)	1	%	68	92	88	94
13C2-PFTeDA (surr.)	1	%	51	103	89	110
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C8-FOSA (surr.)	1	%	60	67	63	61
D3-N-MeFOSA (surr.)	1	%	67	75	66	46
D5-N-EtFOSA (surr.)	1	%	116	152	137	91
D7-N-MeFOSE (surr.)	1	%	40	51	48	37
D9-N-EtFOSE (surr.)	1	%	35	42	38	24
D5-N-EtFOSAA (surr.)	1	%	99	106	106	96
D3-N-MeFOSAA (surr.)	1	%	74	51	46	31
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.3	ug/kg	< 0.3	< 0.3	< 0.3	< 0.3
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorooctanesulfonic acid (PFOS)[N11]	0.3	ug/kg	[N09]0.5	0.4	[N09]0.6	[N09]0.9
Perfluorodecanesulfonic acid (PFDS)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C3-PFBS (surr.)	1	%	48	66	63	59
18O2-PFHxS (surr.)	1	%	77	81	76	78
13C8-PFOS (surr.)	1	%	65	70	75	72

Client Sample ID			212558316_PORARM_(1-5)_1_290518	212558316_PORARM_(6-10)_2_290518	212558316_PORARM_(11-15)_3_290518	212558316_PORARM_(16-20)_4_290518
Sample Matrix			**Fish**	**Fish**	**Fish**	**Fish**
Eurofins | mgt Sample No.			**B18-Jn04392**	**B18-Jn04393**	**B18-Jn04394**	**B18-Jn04395**
Date Sampled			**May 29, 2018**	**May 29, 2018**	**May 29, 2018**	**May 29, 2018**
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C2-4:2 FTSA (surr.)	1	%	53	69	63	58
13C2-6:2 FTSA (surr.)	1	%	83	91	82	83
13C2-8:2 FTSA (surr.)	1	%	74	86	76	78
PFASs Summations						
Sum (PFHxS + PFOS)*	0.5	ug/kg	0.5	< 0.5	0.6	0.9
Sum of US EPA PFAS (PFOS + PFOA)*	0.5	ug/kg	0.5	< 0.5	0.6	0.9
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.5	ug/kg	0.5	< 0.5	0.6	0.9
Sum of WA DER PFAS (n=10)*	0.5	ug/kg	0.5	< 0.5	0.6	0.9
Sum of PFASs (n=28)*	0.5	ug/kg	0.5	< 0.5	0.6	0.9

Client Sample ID			SED1	SED1DUP	SED2	SED2DUP
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**B18-Jn04602**	**B18-Jn04603**	**B18-Jn04604**	**B18-Jn04605**
Date Sampled			**May 31, 2018**	**May 31, 2018**	**May 31, 2018**	**May 31, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	48	44	48	46
13C5-PFPeA (surr.)	1	%	52	52	60	64
13C5-PFHxA (surr.)	1	%	57	51	54	57
13C4-PFHpA (surr.)	1	%	47	44	46	50
13C8-PFOA (surr.)	1	%	49	44	48	48
13C5-PFNA (surr.)	1	%	50	47	49	52
13C6-PFDA (surr.)	1	%	49	44	48	52
13C2-PFUnDA (surr.)	1	%	58	55	57	61
13C2-PFDoDA (surr.)	1	%	60	51	56	57
13C2-PFTeDA (surr.)	1	%	81	77	81	80

Client Sample ID			SED1	SED1DUP	SED2	SED2DUP
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**B18-Jn04602**	**B18-Jn04603**	**B18-Jn04604**	**B18-Jn04605**
Date Sampled			**May 31, 2018**	**May 31, 2018**	**May 31, 2018**	**May 31, 2018**
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	75	75	78	76
D3-N-MeFOSA (surr.)	1	%	91	84	86	92
D5-N-EtFOSA (surr.)	1	%	109	99	96	100
D7-N-MeFOSE (surr.)	1	%	65	63	60	57
D9-N-EtFOSE (surr.)	1	%	62	56	59	61
D5-N-EtFOSAA (surr.)	1	%	49	47	49	54
D3-N-MeFOSAA (surr.)	1	%	40	38	40	47
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	66	66	65	69
18O2-PFHxS (surr.)	1	%	66	67	68	70
13C8-PFOS (surr.)	1	%	83	83	81	84
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	12	12	11	16
13C2-6:2 FTSA (surr.)	1	%	14	15	12	INT
13C2-8:2 FTSA (surr.)	1	%	17	18	19	24
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=28)*	50	ug/kg	< 50	< 50	< 50	< 50
% Moisture	1	%	34	36	31	28

Client Sample ID			SED3	SED3DUP	SED4	SED4DUP
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			B18-Jn04606	B18-Jn04607	B18-Jn04608	B18-Jn04609
Date Sampled			May 31, 2018	May 31, 2018	May 31, 2018	May 31, 2018
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	49	52	52	49
13C5-PFPeA (surr.)	1	%	45	57	51	59
13C5-PFHxA (surr.)	1	%	57	58	62	56
13C4-PFHpA (surr.)	1	%	49	47	50	50
13C8-PFOA (surr.)	1	%	49	49	51	48
13C5-PFNA (surr.)	1	%	53	50	56	53
13C6-PFDA (surr.)	1	%	48	51	52	52
13C2-PFUnDA (surr.)	1	%	63	61	62	62
13C2-PFDoDA (surr.)	1	%	57	56	65	59
13C2-PFTeDA (surr.)	1	%	86	77	84	84
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	79	72	80	76
D3-N-MeFOSA (surr.)	1	%	93	82	94	98
D5-N-EtFOSA (surr.)	1	%	106	95	106	110
D7-N-MeFOSE (surr.)	1	%	63	51	68	59
D9-N-EtFOSE (surr.)	1	%	62	56	68	66
D5-N-EtFOSAA (surr.)	1	%	55	49	58	57
D3-N-MeFOSAA (surr.)	1	%	46	40	47	45
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	69	69	71	69
18O2-PFHxS (surr.)	1	%	65	71	71	75
13C8-PFOS (surr.)	1	%	82	85	84	84

Client Sample ID			SED3	SED3DUP	SED4	SED4DUP
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**B18-Jn04606**	**B18-Jn04607**	**B18-Jn04608**	**B18-Jn04609**
Date Sampled			**May 31, 2018**	**May 31, 2018**	**May 31, 2018**	**May 31, 2018**
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	14	14	11	15
13C2-6:2 FTSA (surr.)	1	%	12	14	14	13
13C2-8:2 FTSA (surr.)	1	%	18	22	21	17
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=28)*	50	ug/kg	< 50	< 50	< 50	< 50
% Moisture	1	%	40	39	24	24

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	Jun 05, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Jun 05, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Jun 05, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Jun 05, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
% Moisture	Brisbane	Jun 05, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

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NATA # 1261
Site # 23736

Company Name: GHD Pty Ltd NSW
Address: Level 15, 133 Castlereagh Street
Sydney
NSW 2000

Project Name: LAKE ILLAWARRA SAMPLES
Project ID: 212558316

Order No.:
Report #: 601574
Phone: 02 9239 7100
Fax: 02 9239 7199

Received: Jun 1, 2018 1:17 PM
Due: Jun 15, 2018
Priority: 10 Day
Contact Name: Phil Taylor

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	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	212558316_PLAFUS_(1-5)_1_290518	May 29, 2018		Fish	B18-Jn04372			X
2	212558316_PLAFUS_(6-10)_2_290518	May 29, 2018		Fish	B18-Jn04373			X
3	212558316_PLAFUS_(11-15)_3_290518	May 29, 2018		Fish	B18-Jn04374			X
4	212558316_PLAFUS_(16-20)_4_290518	May 29, 2018		Fish	B18-Jn04375			X

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Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
5	212558316_MUGCEP_(1-5)_1_290518	May 29, 2018		Fish	B18-Jn04376			X
6	212558316_MUGCEP_(6-10)_2_290518	May 29, 2018		Fish	B18-Jn04377			X
7	212558316_MUGCEP_(11-15)_3_290518	May 29, 2018		Fish	B18-Jn04378			X
8	212558316_MUGCEP_(16-20)_4_290518	May 29, 2018		Fish	B18-Jn04379			X
9	212558316_ANATRA_(1-5)_1_290518	May 29, 2018		Fish	B18-Jn04380			X

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Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
10	212558316_ANATRA_(6-10)_2_290518	May 29, 2018		Fish	B18-Jn04381			X
11	212558316_ANATRA_(11-15)_3_290518	May 29, 2018		Fish	B18-Jn04382			X
12	212558316_ANATRA_(16-20)_4_290518	May 29, 2018		Fish	B18-Jn04383			X
13	212558316_ACAAUS_(1-5)_1_290518	May 29, 2018		Fish	B18-Jn04384			X
14	212558316_ACAAUS_(6-10)_2_290518	May 29, 2018		Fish	B18-Jn04385			X

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Sample Detail						HOLD	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								
15	212558316_ACAAUS_(11-15)_3_290518	May 29, 2018		Fish	B18-Jn04386			X
16	212558316_ACAAUS_(16-20)_4_290518	May 29, 2018		Fish	B18-Jn04387			X
17	212558316_GIRTTRI_(1-5)_1_290518	May 29, 2018		Fish	B18-Jn04388			X
18	212558316_GIRTTRI_(6-10)_2_290518	May 29, 2018		Fish	B18-Jn04389			X
19	212558316_GIRTTRI_(11-15)_3_290518	May 29, 2018		Fish	B18-Jn04390			X

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Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
20	212558316_GIRTTRI_(16-20)_4_290518	May 29, 2018		Fish	B18-Jn04391			X
21	212558316_PORARM_(1-5)_1_290518	May 29, 2018		Fish	B18-Jn04392			X
22	212558316_PORARM_(6-10)_2_290518	May 29, 2018		Fish	B18-Jn04393			X
23	212558316_PORARM_(11-15)_3_290518	May 29, 2018		Fish	B18-Jn04394			X
24	212558316_PORARM_(16-20)_4_290518	May 29, 2018		Fish	B18-Jn04395			X

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Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
25	R1 - KNIFE RINSATE	May 29, 2018		Water	B18-Jn04396			X
26	R2 - CHOPPING BOARD RINSATE	May 30, 2018	4:05PM	Water	B18-Jn04397			X
27	R3 - NET RINSATE	May 31, 2018		Water	B18-Jn04398			X
28	TB1 - TRIP BLANK BOAT	May 29, 2018		Water	B18-Jn04399			X
29	TB2 - TRIP BLANK BOAT	May 30, 2018		Water	B18-Jn04400			X
30	TB3 - TRIP BLANK FIELD	May 31, 2018		Water	B18-Jn04401			X
31	WQ1 - LAKE	May 29, 2018	4:30PM	Water	B18-Jn04402			X

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Sample Detail						HOLD	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								
	DAY 1							
32	WQ1DUP - LAKE DAY 1	May 29, 2018	4:30PM	Water	B18-Jn04403			X
33	WQ2 - LAKE DAY 1	May 29, 2018	5:05PM	Water	B18-Jn04404			X
34	WQ2DUP - LAKE DAY 1	May 29, 2018	5:05PM	Water	B18-Jn04405			X
35	WQ3 - MUD ARK LOCATION	May 29, 2018	8:05PM	Water	B18-Jn04406			X
36	WQ3DUP - MUD ARK LOCATION	May 29, 2018	8:05PM	Water	B18-Jn04407			X
37	WQ4 - FIELD BLANK	May 29, 2018	4:40PM	Water	B18-Jn04408			X

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Sample Detail						HOLD	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								
38	WQ5 - FIELD BLANK	May 29, 2018	4:40PM	Water	B18-Jn04409			X
39	WQ6 - KOONA BAY	May 31, 2018	10:15AM	Water	B18-Jn04410			X
40	WQ6DUP - KOONA BAY	May 31, 2018	10:15AM	Water	B18-Jn04411			X
41	WQ7 - KOONA BAY	May 31, 2018	10:40AM	Water	B18-Jn04412			X
42	WQ7DUP - KOONA BAY	May 31, 2018	10:40AM	Water	B18-Jn04413			X
43	WQ8 - KOONA BAY	May 31, 2018	11:10AM	Water	B18-Jn04414			X
44	WQ8DUP - KOONA BAY	May 31, 2018	11:10AM	Water	B18-Jn04415			X

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Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
45	R4 - EUROFINS LAB KNIFE RINSATE	Jun 01, 2018		Water	B18-Jn04416			X
46	R4 - EUROFINS LAB BLENDER RINSATE	Jun 01, 2018		Water	B18-Jn04417			X
47	SED1	May 31, 2018		Soil	B18-Jn04602		X	X
48	SED1DUP	May 31, 2018		Soil	B18-Jn04603		X	X
49	SED2	May 31, 2018		Soil	B18-Jn04604		X	X
50	SED2DUP	May 31, 2018		Soil	B18-Jn04605		X	X
51	SED3	May 31, 2018		Soil	B18-Jn04606		X	X

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Project ID:	212558316				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

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Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
52	SED3DUP	May 31, 2018		Soil	B18-Jn04607		X	X
53	SED4	May 31, 2018		Soil	B18-Jn04608		X	X
54	SED4DUP	May 31, 2018		Soil	B18-Jn04609		X	X
55	212558316_MUGCEP_12_3_290518	May 29, 2018		Fish	B18-Jn04611	X		
Test Counts						1	8	54

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	< 0.5			0.5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 0.5			0.5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 0.5			0.5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 0.5			0.5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 0.5			0.5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 0.5			0.5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 0.5			0.5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 0.5			0.5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 0.5			0.5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 0.5			0.5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 0.5			0.5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 0.5			0.5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 0.5			0.5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 0.5			0.5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/kg	< 0.5			0.5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/kg	< 0.5			0.5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 0.5			0.5	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 0.5			0.5	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 0.5			0.5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 0.5			0.5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 0.3			0.3	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 0.5			0.5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 0.3			0.3	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 0.5			0.5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 0.5			0.5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/kg	< 0.5			0.5	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 0.5			0.5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 0.5			0.5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	102			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	102			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	100			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	103			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	101			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	103			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	114			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	97			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	103			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	85			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	102			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)	%	95			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	97			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)	%	102			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	97			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	95			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	89			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	92			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	86			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	93			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	95			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	56			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	94			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	93			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	111			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	61			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-Jn04373	CP	%	101			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B18-Jn04373	CP	%	94			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B18-Jn04373	CP	%	102			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-Jn04373	CP	%	102			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B18-Jn04373	CP	%	101			50-150	Pass	
Perfluorononanoic acid (PFNA)	B18-Jn04373	CP	%	102			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B18-Jn04373	CP	%	113			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-Jn04373	CP	%	98			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-Jn04373	CP	%	101			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-Jn04373	CP	%	87			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B18-Jn04373	CP	%	107			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B18-Jn04373	CP	%	97			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Jn04373	CP	%	101			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Jn04373	CP	%	101			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Jn04373	CP	%	107			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Jn04373	CP	%	103			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Jn04373	CP	%	101			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Jn04373	CP	%	92			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-Jn04373	CP	%	90			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B18-Jn04373	CP	%	97			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B18-Jn04373	CP	%	84			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B18-Jn04373	CP	%	90			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B18-Jn04373	CP	%	93			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B18-Jn04373	CP	%	62			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-Jn04373	CP	%	98			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Jn04373	CP	%	101			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Jn04373	CP	%	110			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Jn04373	CP	%	83			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B18-Jn04375	CP	%	102			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B18-Jn04375	CP	%	94			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B18-Jn04375	CP	%	102			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-Jn04375	CP	%	102			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B18-Jn04375	CP	%	102			50-150	Pass	
Perfluorononanoic acid (PFNA)	B18-Jn04375	CP	%	102			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B18-Jn04375	CP	%	106			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-Jn04375	CP	%	100			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-Jn04375	CP	%	101			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-Jn04375	CP	%	79			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B18-Jn04375	CP	%	101			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B18-Jn04375	CP	%	98			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Jn04375	CP	%	100			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Jn04375	CP	%	98			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Jn04375	CP	%	104			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Jn04375	CP	%	98			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Jn04375	CP	%	97			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Jn04375	CP	%	89			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-Jn04375	CP	%	91			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B18-Jn04375	CP	%	96			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B18-Jn04375	CP	%	87			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B18-Jn04375	CP	%	95			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B18-Jn04375	CP	%	95			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B18-Jn04375	CP	%	57			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-Jn04375	CP	%	93			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Jn04375	CP	%	98			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Jn04375	CP	%	106			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Jn04375	CP	%	87			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B18-Jn04393	CP	%	101			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B18-Jn04393	CP	%	98			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B18-Jn04393	CP	%	103			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-Jn04393	CP	%	101			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B18-Jn04393	CP	%	105			50-150	Pass	
Perfluorononanoic acid (PFNA)	B18-Jn04393	CP	%	100			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B18-Jn04393	CP	%	103			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-Jn04393	CP	%	100			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-Jn04393	CP	%	102			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-Jn04393	CP	%	98			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B18-Jn04393	CP	%	102			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B18-Jn04393	CP	%	106			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Jn04393	CP	%	93			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Jn04393	CP	%	95			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Jn04393	CP	%	111			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Jn04393	CP	%	118			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Jn04393	CP	%	94			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Jn04393	CP	%	88			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-Jn04393	CP	%	88			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B18-Jn04393	CP	%	97			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B18-Jn04393	CP	%	83			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B18-Jn04393	CP	%	92			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B18-Jn04393	CP	%	92			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B18-Jn04393	CP	%	85			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-Jn04393	CP	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Jn04393	CP	%	95			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Jn04393	CP	%	106			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Jn04393	CP	%	113			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B18-Jn04603	CP	%	94			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B18-Jn04603	CP	%	83			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B18-Jn04603	CP	%	95			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-Jn04603	CP	%	95			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B18-Jn04603	CP	%	96			50-150	Pass	
Perfluorononanoic acid (PFNA)	B18-Jn04603	CP	%	98			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B18-Jn04603	CP	%	96			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-Jn04603	CP	%	97			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-Jn04603	CP	%	106			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-Jn04603	CP	%	70			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B18-Jn04603	CP	%	97			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B18-Jn04603	CP	%	98			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Jn04603	CP	%	94			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Jn04603	CP	%	96			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Jn04603	CP	%	95			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Jn04603	CP	%	89			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Jn04603	CP	%	97			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Jn04603	CP	%	95			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-Jn04603	CP	%	84			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B18-Jn04603	CP	%	83			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B18-Jn04603	CP	%	87			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B18-Jn04603	CP	%	92			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B18-Jn04603	CP	%	95			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B18-Jn04603	CP	%	146			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-Jn04603	CP	%	74			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Jn04603	CP	%	64			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Jn04603	CP	%	104			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Jn04603	CP	%	103			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)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B18-Jn04372	CP	ug/kg	< 0.3	< 0.3	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B18-Jn04372	CP	ug/kg	0.5	0.6	10	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<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)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Jn04372	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B18-Jn04374	CP	ug/kg	< 0.3	< 0.3	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B18-Jn04374	CP	ug/kg	0.8	0.9	9.0	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<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)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Jn04374	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B18-Jn04392	CP	ug/kg	< 0.3	< 0.3	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B18-Jn04392	CP	ug/kg	0.5	0.5	1.0	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<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)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Jn04392	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Jn04602	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Jn04602	CP	ug/kg	< 10	< 10	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B18-Jn04602	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)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Jn04602	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Jn04602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-My08576	NCP	%	2.2	1.8	18	30%	Pass	

Comments

This report has been revised (V2) to amend PFAS LORs for biota samples.

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
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

Nibha Vaidya	Analytical Services Manager
Jonathon Angell	Senior Analyst-Organic (QLD)
Myles Clark	Senior Analyst-Metal (QLD)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

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Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
Draft	J Cox, P Taylor, H Lanza	M Clough	Approval on file	J Hallchurch	Approval on file	10/08/2018
Rev 0	J Cox, P Taylor, H Lanza	J Hallchurch		J Hallchurch		26/04/2019
Rev 1	J Cox, P Taylor, H Lanza	J Hallchurch		J Hallchurch		06/05/2019

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